

# Appendix A:

## Brief Guide to Microsoft Project Professional 2016

**Note:** This guide was written using the free trial of Microsoft Project Professional 2016 and Windows 10 in 2016. Your screens may appear slightly different. The files and instructions in this guide will work with Project Online Professional. The purpose of this guide is to provide current or future project managers with hands-on experience in using a popular and powerful project management software tool.

**June 2018 update:** Check with your instructor about using Microsoft Project. Microsoft changes which free trials are available and updates software frequently. As of June 2018, you can access a 30-day free trial of Project Online Professional. Many schools may provide access as well.

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# INTRODUCTION

There are hundreds of project management software products on the market today. “The Project Portfolio Management (PPM) market size is expected to grow from USD 2.52 Billion in 2015 to USD 4.63 Billion by 2020, at a Compound Annual Growth Rate (CAGR) of 12.9%.”<sup>1</sup> Leading vendors include Microsoft, CA Technologies, HP, Oracle (who acquired Primavera), Planview, and SAP. Many smaller companies also provide their own products. Unfortunately, many people who own this type of software have little idea how to use it. It is important to understand basic concepts of project management, such as creating a work breakdown structure, determining task dependencies, assigning resources, setting up project portfolios, and so on before making effective use of PPM software. Many project teams still use spreadsheets or other familiar software to help manage projects. However, if you can master a good project management software tool, it can really help in managing projects. This appendix summarizes basic information on project management software in general. It also provides a brief guide to using Microsoft Project Professional 2016, the latest version of this popular software.

## PROJECT MANAGEMENT SOFTWARE

As described at the end of Chapter 1, there are three basic categories of project management software based on their capabilities: low-end, midrange, and high-end tools. The market size mentioned by Gartner is for Project Portfolio Management (PPM) software, or the high-end category. It is often used across large organizations to manage thousands of projects while also providing portfolio management features. Low-end tools today are often free or very inexpensive, and most are available online. For example, popular tools include Basecamp, Trello, Zoho Projects, and Wrike, to name a few. Several low-end tools focus on project team collaboration and coordination and may not have features like critical path analysis, resource allocation, and status reporting, like mid-range and high-end tools do.

Microsoft Project Professional 2016 is considered to be a midrange tool. It is only one of Microsoft’s offerings in the project management realm as of 2016. Figure A-1 provides a summary of the “plans” or options for project management software available just from Microsoft. Notice that the options focus on who will be using the software and what type of features are needed. Often an organization needs a combination of tools. For example, project managers might focus on using Project Professional synced with Project Online, team members might use Project Lite, and PMO staff and executives might use Project Online. Now more than ever, deciding what project management software to use is a project in itself!

Because this text focuses on work done by project managers and the software is available as a free trial, this Appendix provides a guide for using Project Professional 2016.

Select a plan

	Project managers			Team members	PMO & Executives	
	Project Pro for Office 365	Project Professional	Project Standard	Project Lite	Project Online	Project Server
	Desktop client w/ Cloud subscription	Desktop client	Desktop client	Add-on module	Cloud subscription	Server on premises
	\$25.00 user/month	\$1159.99	\$589.99	\$7.00 user/month	\$33.00 user/month	Find a Partner
	Buy now	Buy now	Buy now	Buy now	Buy now	
	Learn more	Learn more	Learn more	Learn more	Learn more	Learn more
Fully Installed Project Application	<input checked="" type="checkbox"/> On up to 5 PCs	<input checked="" type="checkbox"/> On 1 PC only	<input checked="" type="checkbox"/> 1 PC only			
Project scheduling & costing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Manage tasks	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Reporting & business intelligence	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Share documents				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Collaborate with Skype for Business presence	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Resource management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SharePoint task sync	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Project Online & Project Server Sync	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Click to run deployment	<input checked="" type="checkbox"/>					
Version upgrades	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Submit timesheets				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Demand management					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Portfolio selection & optimization					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Figure A-1. Microsoft Project Options, Source: Microsoft, April 2016**

(<https://products.office.com/en-us/project/compare-microsoft-project-management-software>)

## BASIC FEATURES OF PROJECT MANAGEMENT SOFTWARE

What makes project management software different from other software tools? Why not just use a spreadsheet to help manage projects?

You can do a lot of project management planning and tracking using non-project management software. You could use a simple word processor to list tasks, resources, dates, and so on. If you put that information into a spreadsheet, you can easily sort it, graph it, and perform other functions. A relational

database tool (such as Microsoft Access) could provide even more manipulation of data. You can also use email, social media, and other tools to collaborate with others.

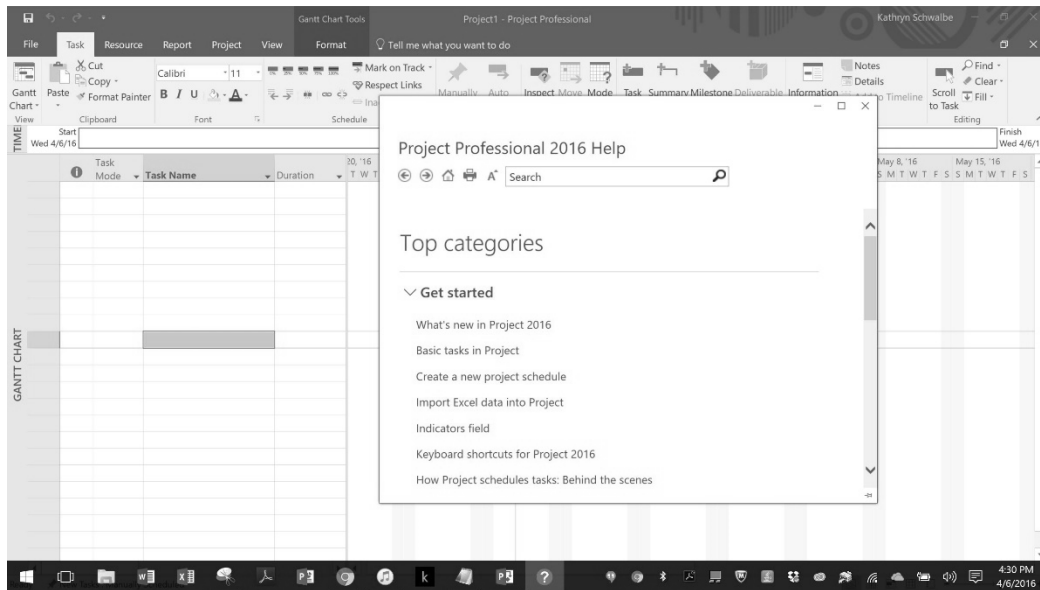
However, project management software is designed specifically for managing projects, so it normally includes several distinct and important features not found in other software products:

- *Creating work breakdown structures, Gantt charts, and network diagrams:* As mentioned in this text, a fundamental concept of project management is breaking down the scope of the project into a work breakdown structure (WBS). The WBS is the basis for creating the project schedule, normally shown as a Gantt chart. The Gantt chart shows start and end dates of tasks as well as dependencies between tasks, which are more clearly shown in a network diagram. Project management software makes it easy to create a WBS, Gantt chart, and network diagram. These features help the project manager and team visualize the project at various levels of detail.
- *Integrating scope, time, and cost data:* The WBS is a key tool for summarizing the scope of a project, and the Gantt chart summarizes the time or schedule for a project. Project management software allows you to assign cost and other resources to activities on the WBS, which are tied to the schedule. This allows you to create a cost baseline and use earned value management to track project performance in terms of scope, time, and cost in an integrated fashion.
- *Setting a baseline and tracking progress:* Another important concept of project management is preparing a plan and measuring progress against the plan. Project management software lets you track progress for each activity. The tracking Gantt chart is a nice tool for easily seeing the planned and actual schedule, and other views and reports show progress in other areas.
- *Providing other advanced project management features:* Project management software often provides other advanced features, such as setting up different types of scheduling dependencies, determining the critical path and slack for activities, working with multiple projects, and leveling resources. For example, you can easily set up an activity to start when its predecessor is halfway finished. After entering dependencies, the software should easily show you the critical path and slack for each activity. You can also set up multiple projects in a program and perform portfolio management analysis with some products. Many project management software products also allow you to easily adjust resources within their slack allowances to create a smoother resource distribution. These advanced features unique to project management are rarely found in other software tools.

As you can see, there are several important features that are unique to project management software that make them worth using. Next you'll learn what's new in Project Professional 2016 and how to use basic features.

## **WHAT'S NEW IN PROJECT PROFESSIONAL 2016**

If you are familiar with Project Professional 2013 or earlier versions, it may be helpful to review some of the new features in Project Professional 2016. An easy way to do this is by using one of the new features – a tab on the ribbon called “Tell me what you want to do.” Figure A-2 shows the results after typing in “What’s new” and then selecting “Get started.” Figure A-3 summarizes the results after selecting “What’s new in Project 2016.”



**Figure A-2. Finding what's new with the Tell me what you want to do feature**

### *More flexible timelines*

With Project 2016, not only can you leverage **multiple timelines** to illustrate different phases or categories of work, but you can also **set the start and end dates for each timeline** separately, to paint a clearer overall picture of the work involved.

### *Better control over resource scheduling*

Some resources have limited availability, and may have their time scheduled by a resource manager. With Project Professional 2016 and Project Online, project managers and resource managers can negotiate an agreement, called a **resource engagement**, to make sure that resources are being used appropriately and effectively throughout your organization.

### *Do things quickly with Tell Me*

You'll notice a text box on the ribbon in Project 2016 that says **Tell me what you want to do**. This is a text field where you can enter words and phrases related to what you want to do next and quickly get to features you want to use or actions you want to perform. You can also choose to get help related to what you're looking for.

### *New themes for Project*

There are now three Office themes that you can apply to Project 2016: Colorful, Dark Gray, and White.

**Figure A-3. What's New in Project 2016**

Next, you will learn some basic information about Project Professional 2016 and explore the main screen elements and Help facility.

## USING PROJECT PROFESSIONAL 2016

Before you can use any project management software effectively, you must understand the fundamental concepts of project management, such as creating a work breakdown structure (WBS), establishing dependencies between activities, entering duration estimates, assigning resources, and so on. This Appendix is included with several project management text books by the author. Make sure you review these concepts before using Project Professional 2016 so you understand what you are doing.

### *Before You Begin*

This appendix assumes you are using Microsoft Project Professional 2016 with Windows 10 and are familiar with other Windows-based applications. Check your work by reviewing the many screen shots included in the steps, or by using the solution files that are available for download from the companion website for this text or from your instructor. Project Online Professional will also work with these instructions.

**NOTE:** *You need to be running Windows 7 or later to use Project Professional 2016 and an up-to-date browser. Certain features require internet connectivity.* You can **read more detailed system requirements** and download a free trial from Microsoft. This powerful software is very expensive. Microsoft sells Project Professional 2016 on its website for \$1,159.99 as of April 2016. Many colleges and universities provide the software to students either on campus or through remote access. If you can use remote access, the main requirement is high speed internet connectivity. Check with your instructor for details or for alternatives if you do not have easy access to the software. Project Online Professional is available as a free trial as of June 2018.

This appendix uses several template files and a fictitious project to illustrate how to use the software. The WBS for the fictitious file uses the five project management process groups as level 2 items (initiating, planning, executing, monitoring and controlling, and closing). Standard deliverables under each of those process groups are included. Each section of the appendix includes hands-on activities for you to perform.

**NOTE:** To complete some of the hands-on activities in the appendix, you will need to download files from [www.intropm.com](http://www.intropm.com) or [www.pmtxts.com](http://www.pmtxts.com) to your computer. When you begin each set of steps, make sure you are using the correct file. Save the files you create yourself in a different folder so you do not write over the ones you download.

In addition, you will create the following files from scratch as you work through the steps:

- 2016wbs.mpp
- 2016schedule.mpp
- 2016actuals.mpp

You will also use the following file to create a hyperlink:

- stakeholder register.doc

### *Using the free Trial of Project Online (as of June 2018):*

If you plan to download the free trial, perform the following steps:

1. Go to Microsoft's website for free trials (<https://products.office.com/en-us/project/compare-microsoft-project-management-software?tab=1>) as of June 2018) and click on the **Try** button under Project Online Professional. If that link does not work, **check for updates on [www.intropm.com](http://www.intropm.com) or [www.pmtxts.com](http://www.pmtxts.com)**. Also, be sure to read the preinstall information, including the FAQs.

2. Enter your account information. You do need a Microsoft account. It used to be called a Windows Live account, so you may already have one if you set it up for Xbox, SkyDrive, Office 2013, Office 365 or other items. If you do not have a Microsoft account, set one up for free.
3. Install Project Professional 2016. Try the 32-bit option first. After downloading the exe file, run it and enter the product key Microsoft provides when prompted. If you have problems, contact your instructor or Microsoft support. Follow instructions for the Project Online Professional trial.

Next you will learn how to start Microsoft Project Professional 2016 and open a Blank Project.

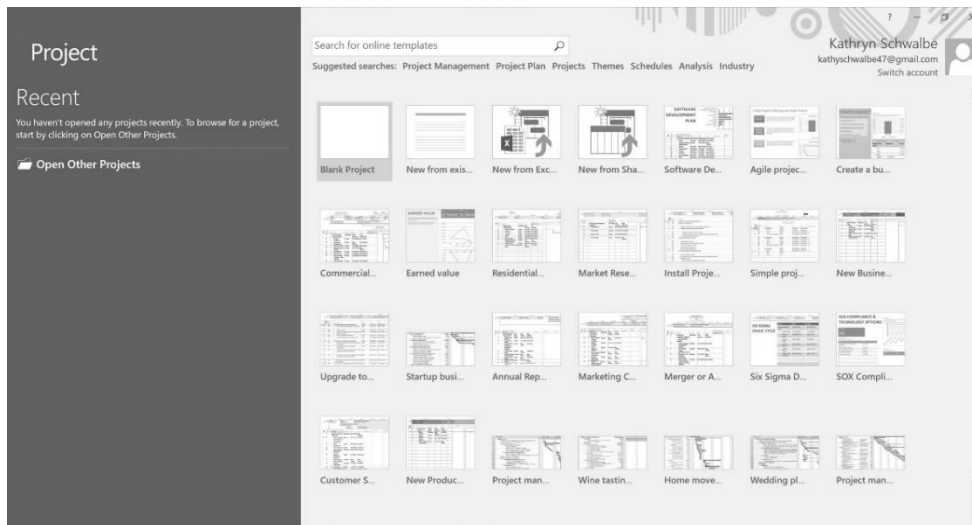
## Overview of Project Professional 2016

The first step to mastering Project Professional 2016 is to become familiar with the major screen elements and the Help facility. This section describes each of these features.

### Getting Started and Finding Help

To start Project Professional 2016:

1. *Open Project Professional 2016.* There are slightly different methods for opening Project Professional 2016 depending on your operating system. For example, in Windows 10, click the **Start** button on the taskbar, All Apps, and then click **Project 2016** or **type it in the search bar**. Alternatively, a shortcut or icon might be available on the desktop; in this case, double-click the icon to start the software.
2. *Start a Blank Project.* Click on **Blank Project**, the first option as shown in Figure A-4. The left part of the screen shows recent files (if you have any) and allows you to open other projects as well. The current date is the default project start date.

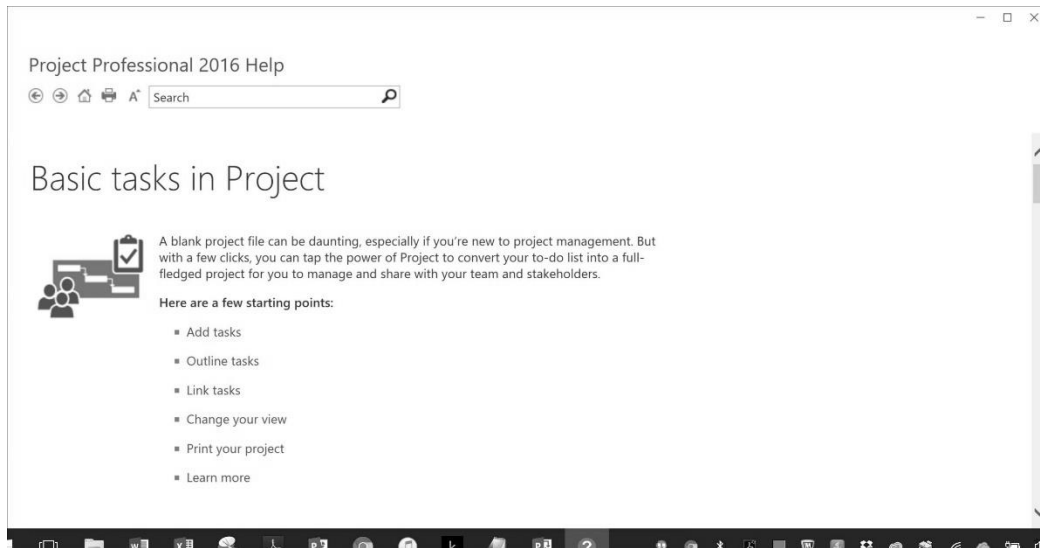


**Figure A-4. Project Professional 2016 initial options – access Blank Project**

3. *Learn about basic tasks in Project.* Click the **Tell me what you want to do** tab, type **Help**, click **Get started**, and then click **Basic tasks in Project**, as shown in Figure A-5.

**NOTE:** The term “tasks” is used in Project Professional 2016, while PMI prefers to use the terms deliverables and activities. Also, the name of the software is often referred to as just Project or Project 2016.





**Figure A-5. Help on basic tasks in Project**

4. *Explore the basic tasks information.* Click on **Add tasks**. Scroll down to read about the other options. You can also type in the search bar to explore other Help topics. When you are finished, **close** the Help window.

## Understanding the Main Screen Elements

Review the main screen elements, as shown in Figure A-6. Look at some of the elements of the screen.

- The Ribbon, tabs, and Quick Access toolbar are similar to other Office applications.
- The timeline view is displayed below the ribbon. It shows a high-level view of the project schedule. You can easily copy the timeline into other software, as most of your stakeholders may want to see it and not the detailed schedule.
- The default manual scheduling for new tasks is on the lower left of the screen. You can click that option to switch to automatic scheduling.
- The default view is the Gantt chart view, which shows tasks and other information in a calendar display. (Recall from the note on the previous page that Microsoft uses the term tasks instead of deliverables or activities.) You can access other views by clicking the View icon on the far left side of the ribbon.
- The areas where you enter information in a spreadsheet-like table are part of the Entry table. For example, you can see entry areas for Task Name, Duration, Start, Finish, and Predecessors.
- You can make the Entry table more or less wide by using the Split bar. When you move the mouse over the split bar, your cursor changes to the resize pointer. Clicking and dragging the split bar to the right reveals columns for Resource Names and Add New columns.
- The first column in the Entry table is the Indicators column. The Indicators column displays indicators or symbols related to items associated with each task, such as task notes or hyperlinks to other files.
- The file name displays centered at the top of the screen. When you open a Blank Project after starting Project 2016, it opens a new file named Project1, which is shown in the title bar. If you open a second Blank Project, the name will be Project2, and so on, until you save and rename the file.

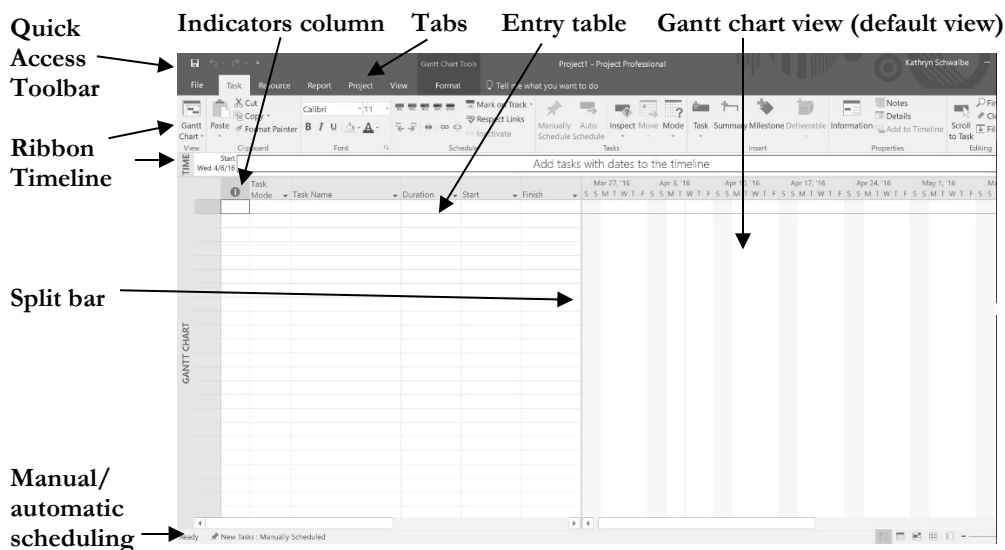


Figure A-6. Project Professional 2016 main screen

Many features in Project Professional 2016 are similar to ones in other Windows programs. For example, to collapse or expand tasks, click the appropriate symbols to the left of the task name. To access shortcut items, right-click in either the Entry table area or the Gantt chart. Many of the Entry table operations are very similar to operations in Excel. For example, to adjust a column width, click and drag between the column heading titles.

Next, you will get some hands-on experience by opening an existing file to explore various screen elements. Project Professional 2016 comes with several template files, and you can also access templates from various websites.

## EXPLORING PROJECT PROFESSIONAL 2016 USING A TEMPLATE FILE

To open a template file and adjust screen elements:

1. *Open a template file.* Click the **File** tab, select **New**, click **Market Research Schedule**, and then click **Create**. These screen shots were taken on April 7, 2016, so you can enter that date if you like or leave the default as “Today” or the current date. Your screen should resemble Figure A-7. (Note: If you cannot find the template, you can download it from [www.intropm.com](http://www.intropm.com) and open it. To open an existing file, click the **File** tab, then select **Open**, and browse to find the file.)
2. *Move the Split Bar.* Move the **Split Bar** to the right so the Task Name and Duration columns are visible.
3. *Expand a WBS item.* Click on the **arrow to the left of Initiation Phase** in the Task Name column to reveal the activities under that WBS item.
4. *View the second Note:* Move your mouse over the yellow **Notes** symbol in the Indicators column for Task 7 to read it. You can insert notes for any task by using the Notes icon on the ribbon.

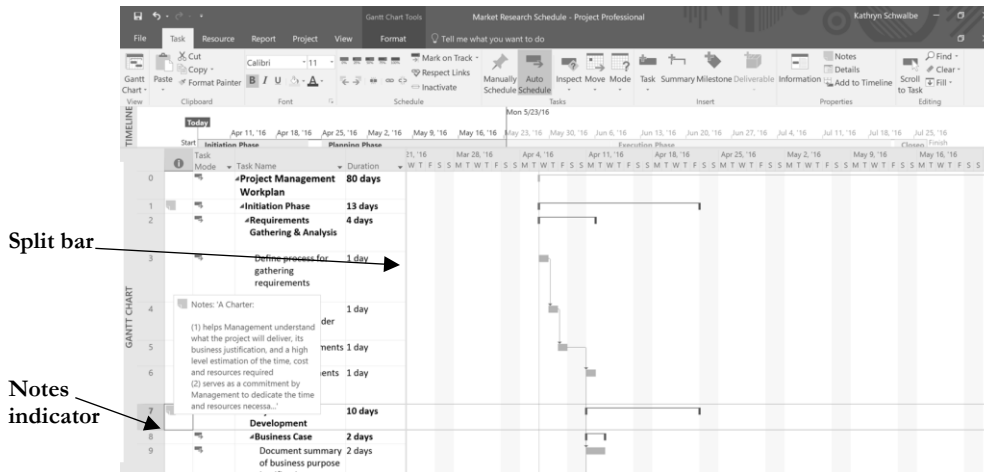


Figure A-7. Market research schedule template file

To show different WBS levels and adjust the timescale:

1. *Select Outline Level 1 to display WBS level 2 tasks.* Click the **View** tab and then the **Outline** button's list arrow, and then click **Outline Level 1**. Notice that only the level 2 WBS items display in the Entry table. The black bars on the Gantt chart represent the summary tasks. Recall that the entire project is normally referred to as WBS level 1, and the next highest level is called level 2.
2. *Adjust the timescale.* Click the **Zoom out** button (minus sign) on the left side of the Zoom slider on the lower left of the screen, as shown in Figure A-8, until you see all of the symbols on the Gantt chart (click it three times). Notice the timescale is now showing quarters instead of weeks. It is often easier to read the schedule when all of the symbols are visible. You can also Zoom in when more details are needed.

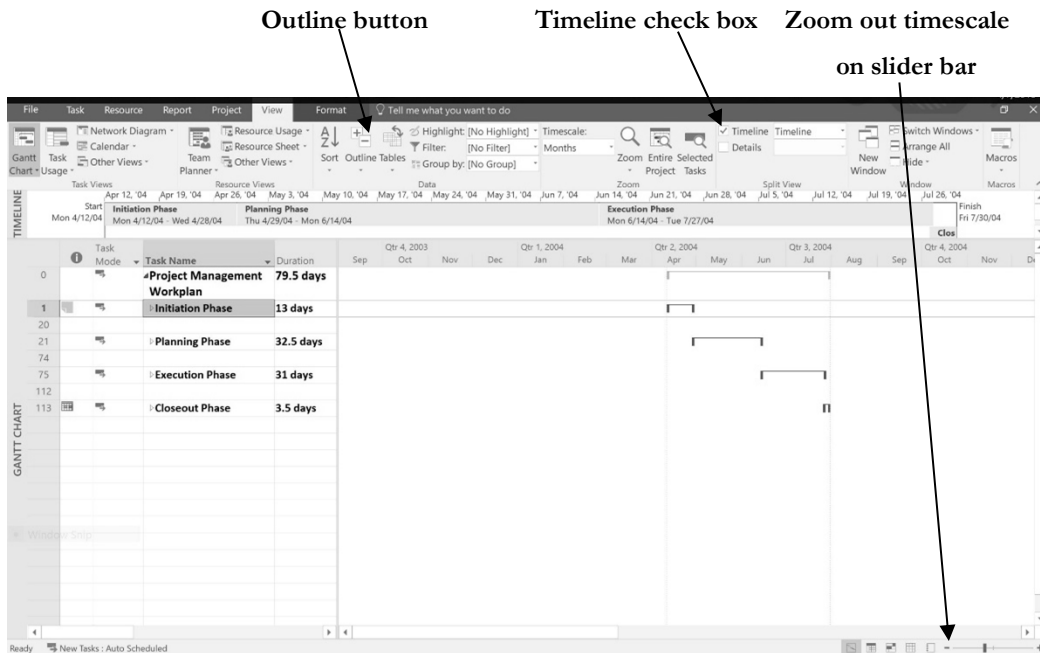


Figure A-8. Showing level 1 of the WBS and adjusted timescale

3. *View all tasks.* Click the Outline button and select All Subtasks to see all of the items in the Task Name column again. Remember that you can expand or collapse tasks as desired.

To adjust, add multiple timelines, share, and print the timeline:

1. *Remove the timeline and display it again.* Click the Timeline checkbox on the Ribbon to unselect it. Click it again to display it. The timeline is different than the time scale as it shows a high-level schedule on one line while the timescale adjusts the time units for symbols on the Gantt chart.
2. *Add a new timeline:* Click anywhere on the current timeline (toward the left side of the screen), click the Format tab, and then click Timeline Bar button under the Timeline Tools. Drag the line between the Timeline and Gantt Chart to reveal the second timeline. Your screen should resemble Figure A-9.

Drag to see second timeline Timeline bar button

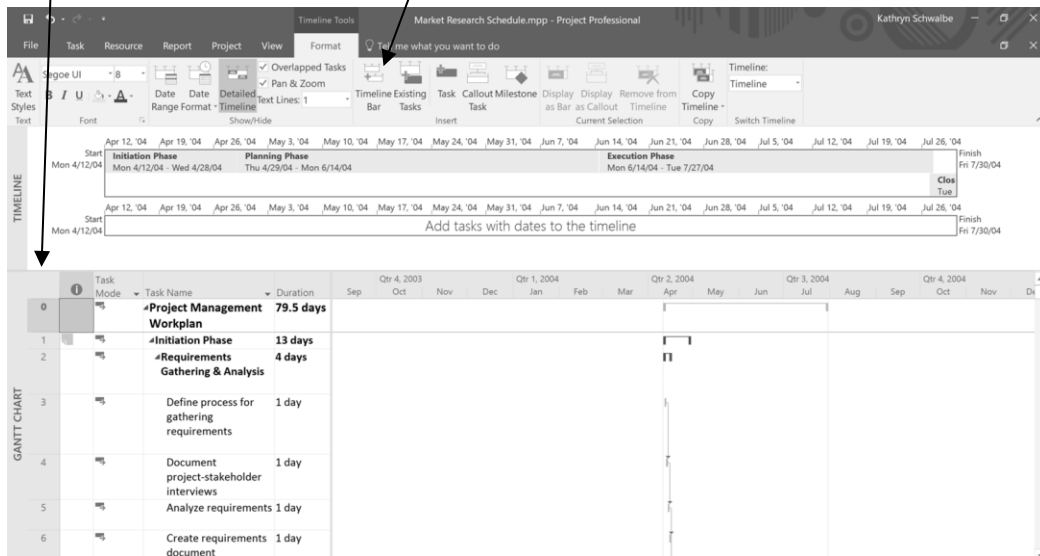


Figure A-9. Adding a second timeline.

3. *Add tasks to the new timeline.* Right-click on Task 2, Requirements Gathering & Analysis, then click Add to Timeline. Scroll down to also right-click on Task 7, Project Charter Development, and then click Add to Timeline to add it as well.
4. *Adjust the dates and format of the new timeline.* Right-click anywhere in the second timeline, click Date Range, and then click Set custom dates. Enter 4/1/04 for the Start date and 5/1/04 for the finish dates. (Remember that this is a template file from Microsoft, and it had the dates entered as 2004).
5. *Display a task as a callout on the timeline.* Right-click on Project Charter Development in the second timeline, and then click Display as callout. Click and drag on the callout to move it down and to the right, as shown in Figure A-10. You can also right-click on a task to change its color or font, if desired.

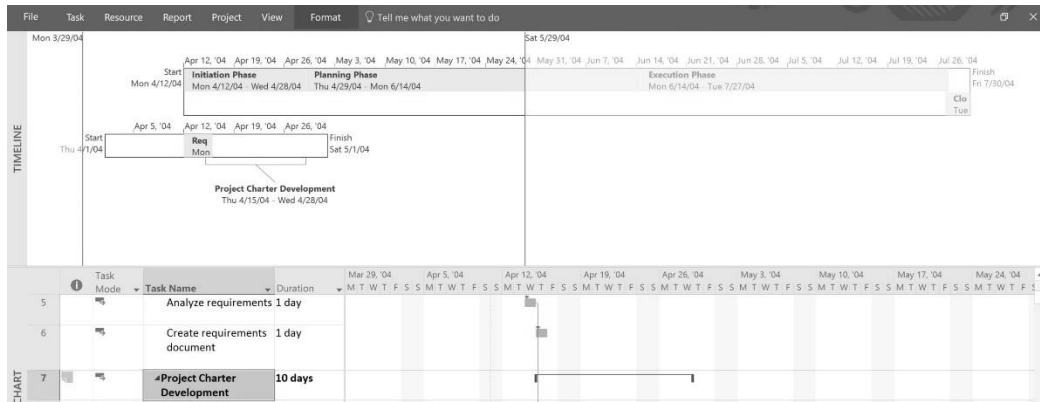


Figure A-10. Second timeline with callout.

6. *Close the file without saving.* Click the Close icon in the upper right of the window, and select No when prompted to save the file.

## Project Professional 2016 Views

Project Professional 2016 provides many ways to display or view project information. In addition to the default Gantt chart, you can view the network diagram, calendar, and task usage views, to name a few. These views allow you to analyze project information in different ways. The View tab also provides access to different tables that display information in various ways. In addition to the default Entry table view, you can access tables that focus on data related to areas such as the Schedule, Cost, Tracking, Variance, and Earned Value tables.

To access and explore different views:

1. *Explore the Network Diagram for the Market Research Schedule file.* Open the **Market Research Schedule** file again. Click the **View** tab, the **Outline** button, and **All Subtasks** again. Click the **Network Diagram** button, and then move the **Zoom slider** on the lower right of the screen all the way to the left. Your screen should resemble Figure A-11. Critical tasks automatically display in red in the Network Diagram view.
2. *Explore the Calendar view.* Click the **Calendar** button (under the Network Diagram button). Notice that the screen lists tasks each day in a calendar format.
3. *Change the table view.* Click the **Gantt Chart** button on the ribbon, click the **Tables** button, and then click **Schedule**. Figure A-12 shows the tables view options.

## Network Diagram

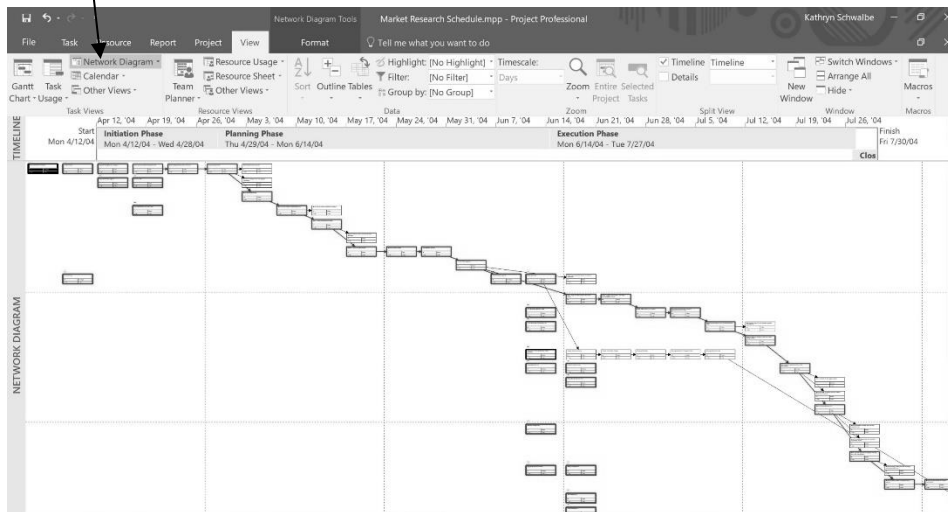


Figure A-11. Network diagram view

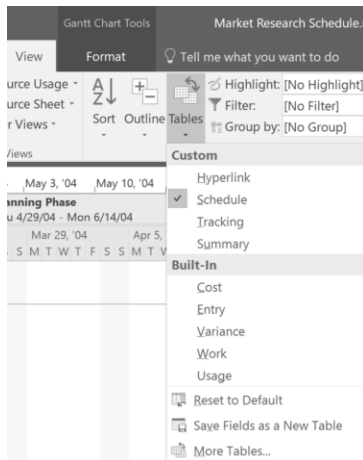


Figure A-12. Tables view options

4. *Examine the Schedule table and other views.* Move the **Split bar** to the right to review the Total Slack column. Notice that the columns in the table to the left of the Gantt chart, as shown in Figure A-13, now display more detailed schedule information, such as Late Start, Late Finish, Free Slack, and Total Slack. Remember that you can widen columns by double-clicking the resize pointer to the right of that column. You must do this for the Start, Finish, and Late Start columns to remove the ##### symbols. You can also move the split bar to reveal more or fewer columns. Experiment with other table views, then return to the **Entry** table view.

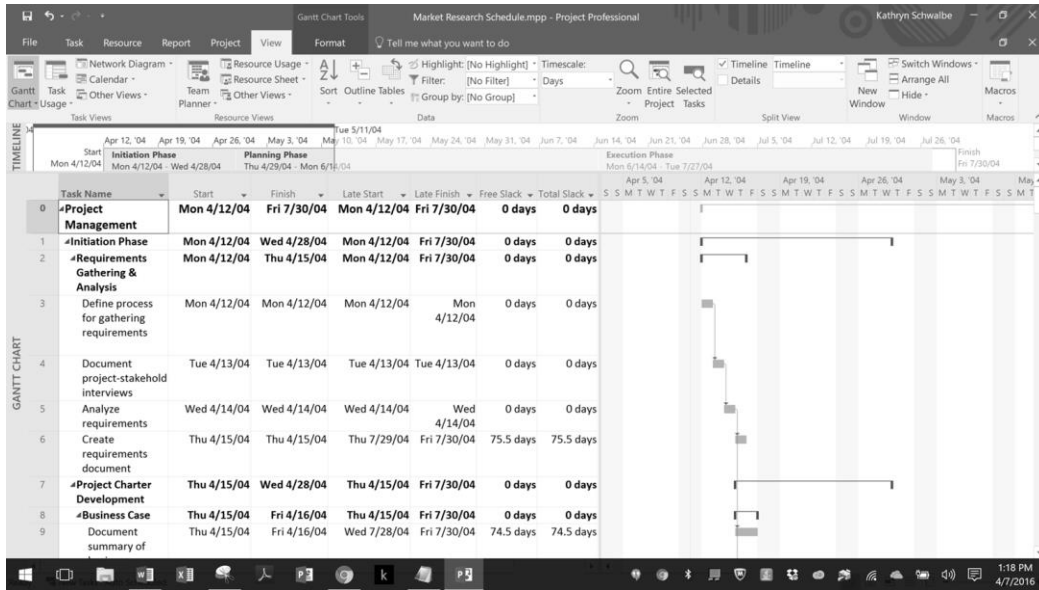


Figure A-13. Schedule table view

5. *Close the file without saving.* Click the **Close icon** in the upper right of the window, and select **No** when prompted to save the file. You can also close Project Professional 2016 if you want to take a break.

## Project Professional 2016 Reports

Project Professional 2016 provides many ways to report project information as well. In addition to traditional reports, you can also prepare visual reports, with both available under the Report tab. Note that the visual reports often require that you have other Microsoft application software, such as Excel and Visio. Project Professional 2016 automatically formats reports for ease of printing.

To access and explore different reports:

1. *Open another template file.* With Project 2016 open, click on the **File tab**, click **New**, then double-click on the template called **Earned value**. Read the information on the initial screen to learn more about the concept of earned value. Click on the **View tab**, then click the **Gantt chart icon**.
2. *Explore the reports feature.* Click the **Report tab** to see the variety of reports available in **Project 2016**, as shown in Figure A-14.

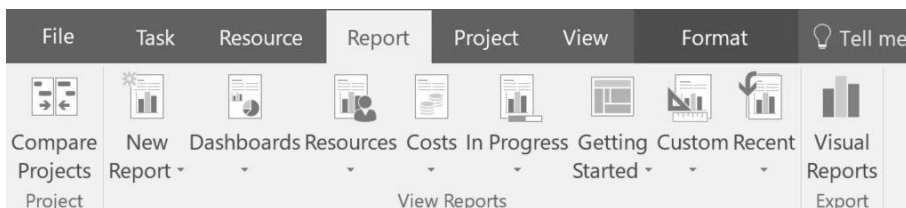


Figure A-14. Report options

3. *View the Project Overview report.* Click **Dashboards**, and then double-click **Project Overview**. Review the report, noting that the project is 17% complete. You must have entered some actual information and cost data to take advantage of this report. Also notice the new options on the ribbon, as shown in Figure A-15.

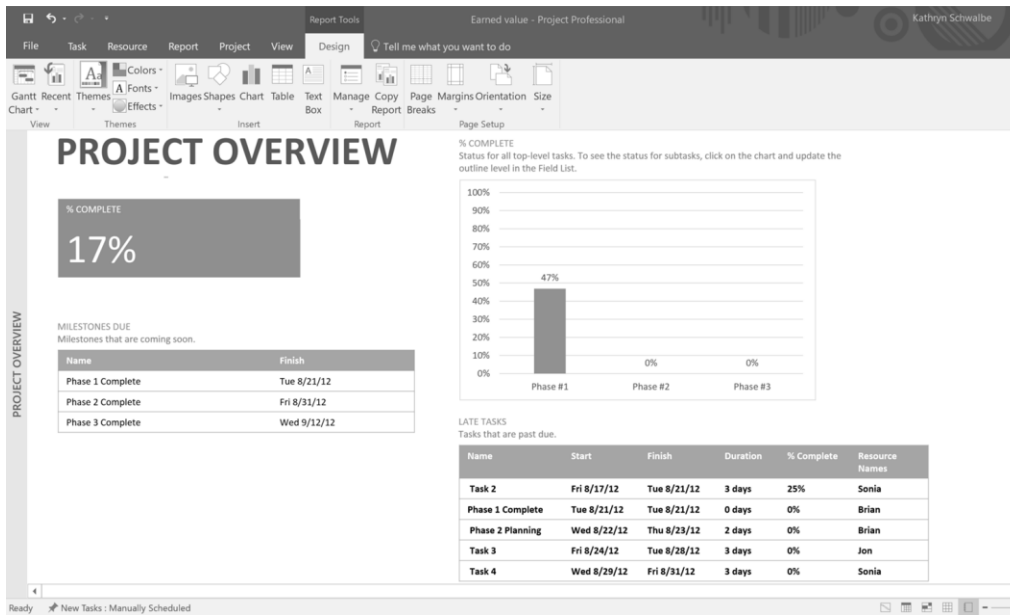


Figure A-15. Project Overview report

4. *Open the Resource Overview report.* Click the **Report** tab again, click **Resources**, and then click **Resource Overview**. Review the report, as shown in Figure A-16.

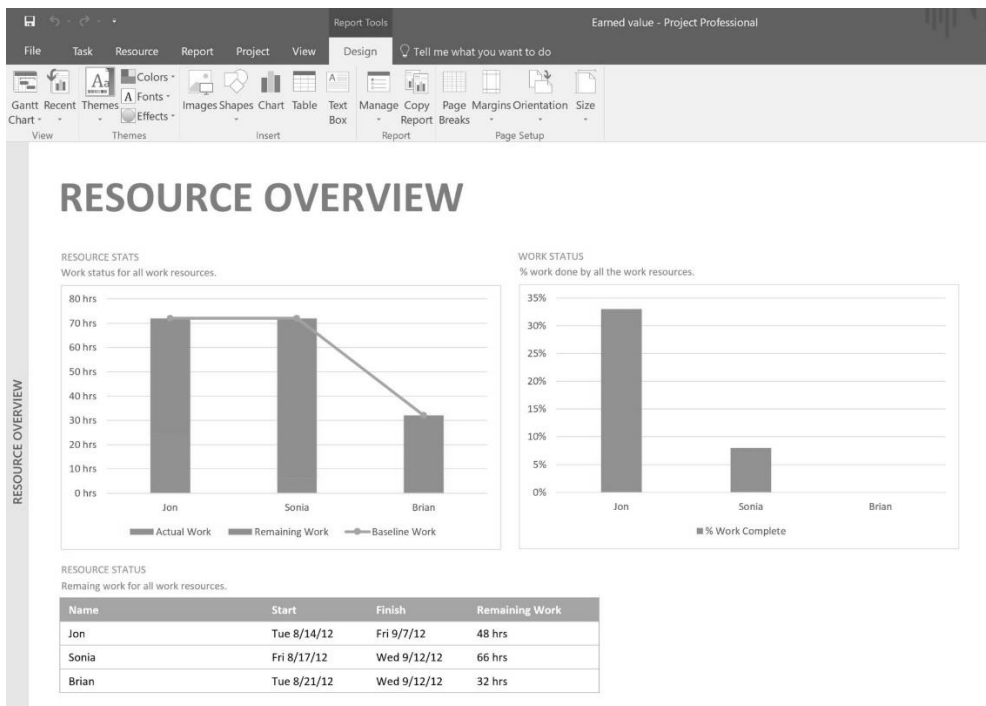


Figure A-16. Resource Overview report

5. *Examine other reports.* Click on the **Report** tab, click **In Progress**, and then click **Critical Tasks** to display the Critical Tasks report, as shown in Figure A-17. Examine other reports.



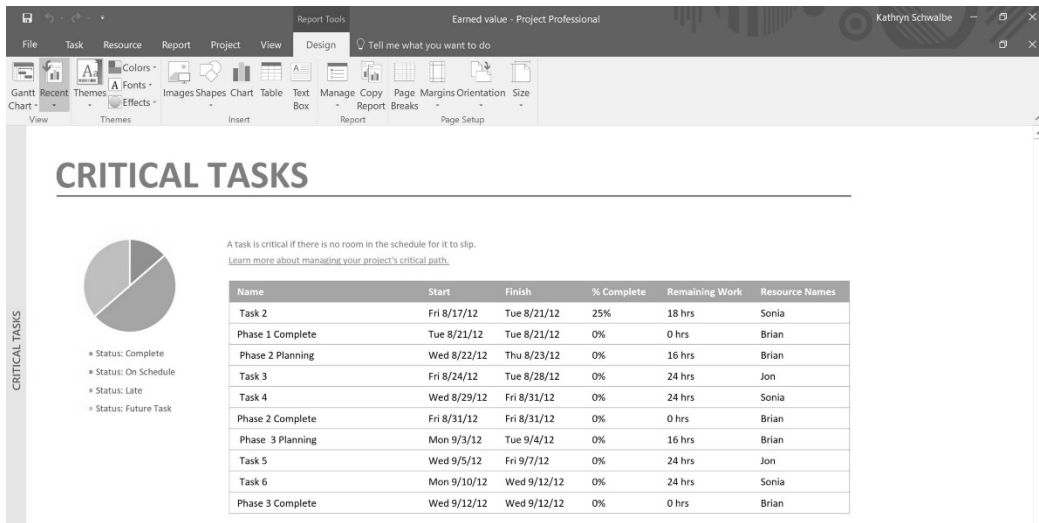


Figure A-17. Critical tasks report

6. Return to the Gantt chart. Click the **View** tab, and then click on **Gantt Chart** to return to the Gantt chart view. Next, you will use this same file to explore filters.

### Project Professional 2016 Filters

Project Professional 2016 uses a relational database to filter, sort, store, and display information. Filtering project information is very useful. For example, if a project includes thousands of tasks, you might want to view only summary or milestone tasks to get a high-level view of the project by using the Milestones or Summary Tasks filter from the Filter list. You can select a filter that shows only tasks on the critical path if that is what you want to see. Other filters include Completed Tasks, Late Tasks, and Date Range, which displays tasks based on dates you provide. As shown earlier, you can also click the Outline button on the toolbar to display different levels in the WBS quickly.

To explore Project Professional 2016 filters:

1. Access filters. Click the **Filter list arrow**, as shown in Figure A-18. The default filter is No Filter, which shows all tasks.

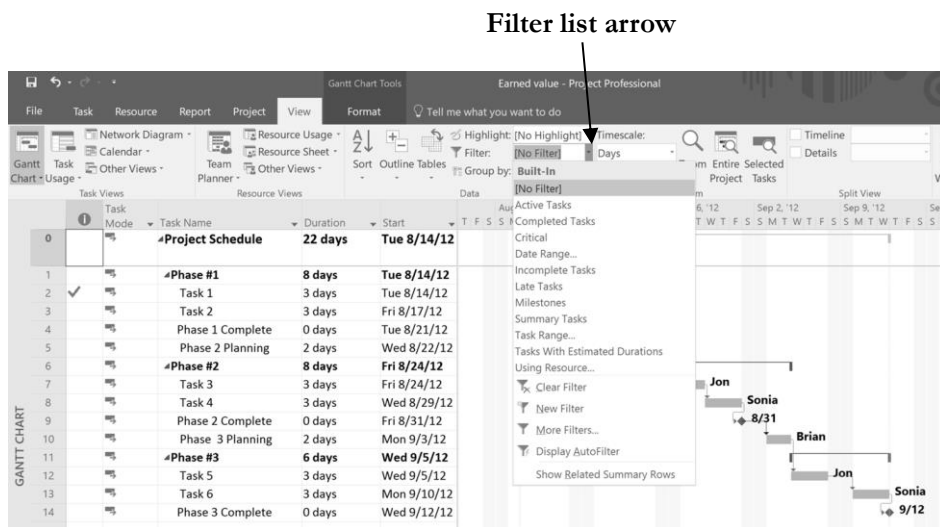
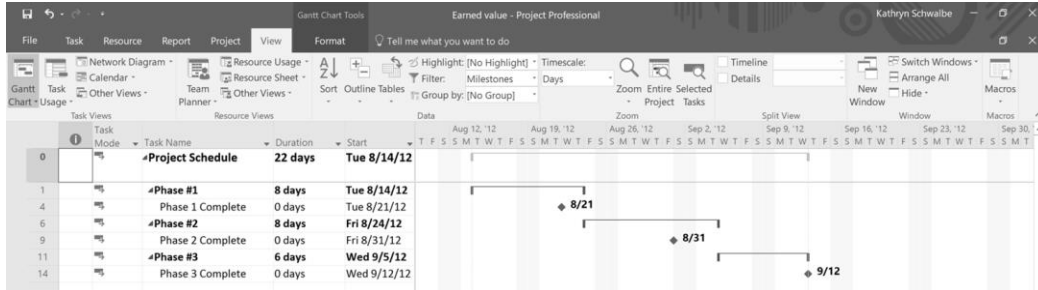


Figure A-18. Using a filter

2. *Filter to show milestones.* Click **Milestones** in the list of filters. Notice that the Gantt chart only shows the summary tasks and milestones for the project. Your screen should resemble Figure A-19. Recall that milestones are significant events.
3. *View other filters.* Click the **Filter** list arrow, and then click **Critical**. Now only the critical tasks appear in the WBS (which happens to be all of the tasks in this file). Experiment with other filters.



**Figure A-19. Milestones filter applied**

4. *Close the file without saving.* When you are finished reviewing the Earned value file, click the **Close icon** for the window, and select **No** when prompted to save the file.
5. *Exit Project 2016.* Review other template files, if desired. When you are finished, click the **Close icon** for Project 2016.

Now that you are familiar with the main screen elements, views, reports, and filters, you will learn how to use Project Professional 2016 to create a new file.

## CREATING A NEW FILE AND ENTERING TASKS IN A WORK BREAKDOWN STRUCTURE

To create a new Project Professional 2016 file, you must first enter the start date, and then enter the tasks. The list of tasks, if entered properly, show the deliverables for the project in a work breakdown structure (WBS) format. Deliverables can be broken down into activities to show more specific actions required to complete the work. The file you create in the following steps could be used for a class project which lasts approximately three months. It uses the project management process groups to reinforce use of several project management deliverables described in this text.

**NOTE:** In this section, you will go through several steps to create a new Project Professional 2016 file named 2016wbs.mpp. If you want to download the completed file to check your work or continue to the next section, a copy is available on the companion website for this text at [www.intropm.com](http://www.intropm.com). Try to complete an entire section of this appendix (entering tasks in a work breakdown structure, developing the schedule, and so on) in one sitting to create the complete file.

### *Creating a New Project File*

To create a new project file:

1. *Create a blank project.* Open Project 2016 and click on **Blank Project**. A blank project file opens with a default filename of Project1, Project2, and so on. (If Project 2016 is already open and you want to open a new file, click the **File** tab, select **New**, and then **Blank Project**.)
2. *Open the Project Information dialog box.* Click the **Project** tab, and then click **Project Information** to display the Project Information dialog box, as shown in Figure A-20. This dialog box enables you to set dates for the project, select the calendar to use, and view project statistics. The project start date will

default to the current date. Note that in Figure A-20 the file was created on 4/11/16 and a Start date of 5/2/16 was entered.

**NOTE:** All dates are entered in month/day/year or American format. You can change the date format by selecting Options from the File tab. Click the date format you want to use in the Date Format box under the General settings. You can also customize the Ribbon, change default currencies in the display, and so on under Project Options.

3. *Enter the project start date.* In the Start date text box, enter **8/1/16**. Setting your project start date to 8/1/16 will ensure that your work matches the results that appear in this appendix. Change the Current date to **8/1/16** as well. Click **OK** or press **Enter**.

The screenshot shows the 'Project Information for Project1' dialog box. It has two arrows pointing to the 'Start date' and 'Current date' text boxes, both of which contain 'Mon 8/1/16'. Other fields include 'Finish date' (Mon 8/1/16), 'Status date' (NA), 'Schedule from' (Project Start Date), 'Calendar' (Standard), and 'Priority' (500). Below these is the 'Enterprise Custom Fields' section with a 'Department' dropdown and a table with columns 'Custom Field Name' and 'Value'. At the bottom are buttons for 'Help', 'Statistics...', 'OK', and 'Cancel'.

Figure A-20. Project information dialog box

### ***Creating a Work Breakdown Structure Hierarchy***

A work breakdown structure (WBS) is a fundamental part of project management. Developing a good WBS takes time, and it will make entering tasks into the Entry table easier if you develop the WBS first. For this example, you will use the project management process groups as the main WBS categories and add some key deliverables, activities, and milestones under each one. You will use the information in Figure A-21 to enter tasks. For the first task, enter **your name**, not the text “enter your name.” Note that Microsoft Project uses the term tasks instead of deliverables or activities or milestones, so it is also used in this appendix.

1. Initiating – enter <b>your name</b>	16. Activity D1
2. Stakeholder identification	17. Activity D2
3. Stakeholder register completed	18. Deliverable 1 completed
4. Stakeholder management strategy completed	19. Deliverable 2
5. Project charter	20. Deliverable 3
6. Project charter completed	21. Monitoring and Controlling
7. Kickoff meeting	22. Actual hours tracking
8. Kickoff meeting completed	23. Project documents updates
9. Planning	24. Progress report 1
10. Schedule	25. Progress report 2
11. Gantt chart completed	26. Team review meetings
12. Scope statement	27. Closing
13. Initial scope statement completed	28. Final project report
14. Executing	29. Final project presentation
15. Deliverable 1	30. Project completed

**Figure A-21. Task list for 2016wbs file**

To develop a WBS for the project:

1. *Enter task names.* Enter the 30 items in Figure A-21 into the Task Name column in the order shown. To not have the text wrap, click on the **Format** Tab, click **Column Settings**, and then click **Wrap Text** to turn it off. Do not worry about durations or any other information at this time. Type the name of each item into the Task Name column of the Entry table, beginning with the first row. Press **Enter** or the **down arrow** key on your keyboard to move to the next row.

**HELP:** If you accidentally skip a row, highlight the task row, right-click, and select Insert Task. To edit a task entry, click the text for that task, and either type over the old text or edit the existing text. Entering tasks into Project Professional 2016 and editing the information is similar to entering and editing data in an Excel spreadsheet. You can also easily copy and paste text from Excel or Word into Project, such as the list of tasks.

2. *Adjust the Task Name column width as needed.* To make all the text display in the Task Name column, move the mouse over the right-column gridline in the **Task Name** column heading until you see the resize pointer , and then click the **left mouse** button and drag the line to the right to make the column wider, or simply double-click to adjust the column width automatically.

This WBS separates tasks according to the project management process groups of initiating, planning, executing, monitoring and controlling, and closing. These categories will be the level 2 items in the WBS for this project. (Remember the whole project is level 1.) It is a good idea to include all of these process groups because there are important deliverables that must be done under each of them. Recall that the WBS should include *all* of the work required for the project. In this example, the WBS will be purposefully left at a high level (level 3). You will create these levels, or the WBS hierarchy, next when you create summary tasks. For a real project, you would usually break the WBS into even more levels and then enter activities to provide

more details to describe all the work involved in the project. For example, each deliverable would probably have several levels, activities, and milestones under it. You can review other texts, template files, or other WBSs for more information. This appendix focuses on the mechanics of using Project Professional 2016.

## Creating Summary Tasks

After entering the items listed in Figure A-21 into the Entry table, the next step is to show the WBS levels by creating summary tasks. The summary tasks in this example are Tasks 1 (initiating), 9 (planning), 14 (executing), 21 (monitoring and controlling), and 27 (closing). Task 15 (Deliverable 1) under executing is also a summary task with Activity D1 and Activity D2 under it. You create summary tasks by highlighting and indenting their respective subtasks.

To create the summary tasks:

1. *Select lower level or subtasks.* Click on the **Task** tab. Highlight **Tasks 2 through 8** by clicking the cell for Task 2 and dragging the mouse through the cells to Task 8.
2. *Indent subtasks.* Click the **Indent Tasks** button on the ribbon (or press Alt + Shift + right arrow) so your screen resembles Figure A-22. After the subtasks (Tasks 2 through 8) are indented, notice that Task 1 automatically becomes boldface, which indicates that it is a summary task. A collapse symbol appears to the left of the new summary task name. Clicking the collapse symbol (filled triangle sign) will collapse the summary task and hide the subtasks beneath it. When subtasks are hidden, an expand symbol (unfilled triangle sign) appears to the left of the summary task name. Clicking the expand symbol will expand the summary task. Also, notice that the symbol for the summary task on the Gantt chart has changed from a blue to a black line with arrows indicating the start and end dates. The Task Mode has also changed to make this task automatically scheduled. You'll learn more about this feature later. For now, focus on entering and indenting the tasks to create the WBS.

Expand or collapse symbols by  
Summary tasks

Indent Task

Summary task symbol

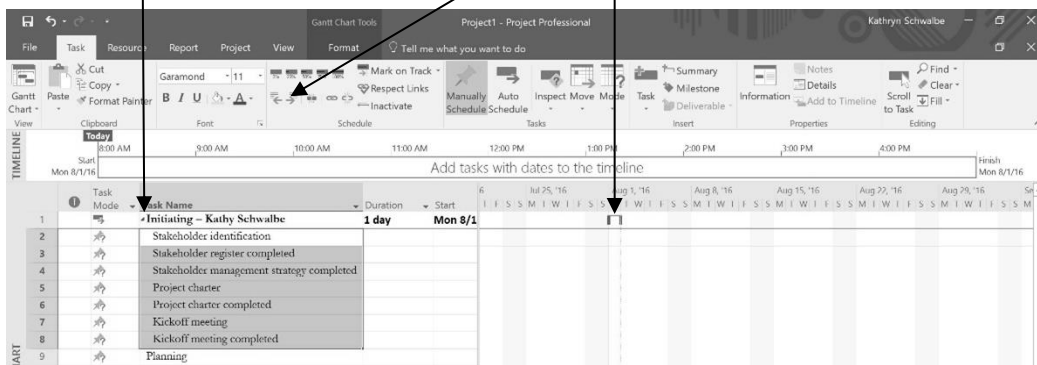


Figure A-22. Indenting tasks to create the WBS hierarchy

3. *Create other summary tasks and subtasks.* Create subtasks and summary tasks for the other process groups by following the same steps. Indent **Tasks 10 through 13** to make Task 9 a summary task. Indent **Tasks 15 through 20** to make Task 14 a summary task. Indent **Tasks 22 through 26** to make Task 21 a summary task. Indent **Tasks 28 through 30** to make Task 27 a summary task. Widen the Task Name column to see all of your text, as needed.
4. *Create another level in the WBS.* Indent **Tasks 16 and 17** to make Task 15 a summary task. Notice that Task 15 is indented even further. On a real project, you would also break down the activities for other deliverables.

**TIP:** To change a task from a subtask to a summary task or to change its level in the WBS, you can “outdent” the task. To outdent the task, click the cell of the task or tasks you want to change, and then click the Outdent Task button (the button just to the left of the Indent Task button). You can also press Alt + Shift + Right Arrow to indent tasks and Alt + Shift + Left Arrow to outdent tasks.

## Numbering Tasks

To display automatic numbering of tasks using the standard tabular numbering system for a WBS:

1. *Show outline numbers.* Click the **Format** tab, and then click the **Outline Number** checkbox on the right side of the ribbon. Project Professional 2016 adds the appropriate WBS numbering to the task names. Note that you can customize the numbering format as desired.
2. *Show project summary task.* Click the **Project Summary** checkbox just below the Outline Number checkbox. Scroll to the top of the file to see that a new task, Project 1, the name of the file, has been added under row 0. Your file should resemble Figure A-23.

Outline Numbers

Outline Number and Project Summary Task check boxes

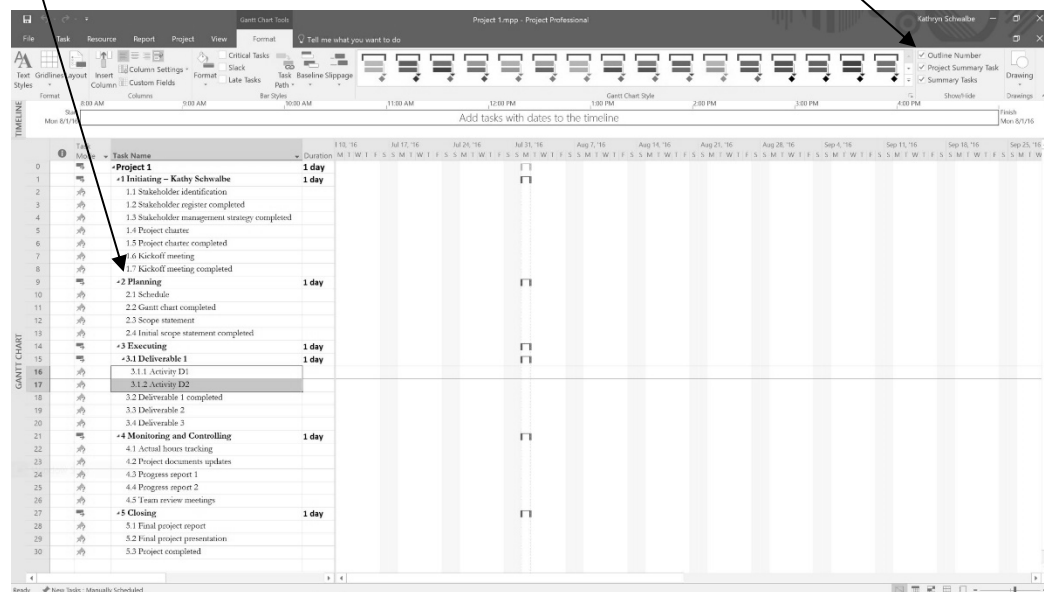


Figure A-23. Adding automatic outline tasks numbers and a project summary task

## Saving Project Files without a Baseline

An important part of project management is tracking performance against a baseline, or approved plan. It is important to wait until you are ready to save your file with a baseline because Project Professional 2016 will show changes against a baseline. Since you are still developing your project file for this project, you want to save the file without a baseline, which is the default way to save a file. Later in this appendix, you will save the file with a baseline. You will then enter actual information to compare planned and actual performance data.

To save a file without a baseline:

1. *Save your file.* Click the **File** tab and then click **Save**, or click the **Save** button on the Quick Access toolbar.
2. *Enter a filename.* In the Save dialog box, type **2016wbs** in the File name text box. Browse to the location in which you want to save the file, and then click **Save**.

3. *Close Project Professional 2016.* Click the **Close icon** to exit.

**HELP:** If you want to download the file 2016wbs.mpp to check your work or continue to the next section, a copy is available on the companion Website for this text, the author's Website, or from your instructor.

## DEVELOPING THE SCHEDULE

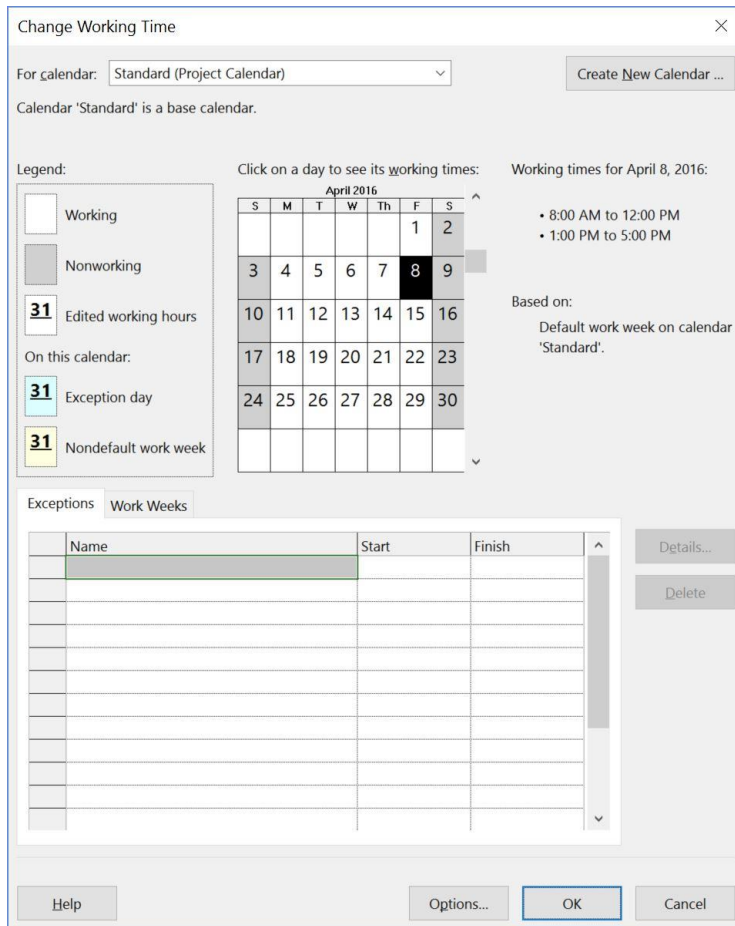
Many people use Project Professional 2016 for its scheduling features. The first step in using these features, after inputting the tasks for the project, is to change calendars, if needed, and then enter durations for tasks or specific dates when tasks will occur. You must also enter task dependencies in order for schedules to adjust automatically and to do critical path analysis. After entering durations and task dependencies, you can view the network diagram, critical path, and slack information.

### *Calendars*

The standard Project Professional 2016 calendar assumes that working hours are Monday through Friday, from 8:00 a.m. to 5:00 p.m., with an hour for lunch from noon until 1:00 p.m. In addition to the standard calendar, Project also includes a 24 Hours calendar and Night Shift calendar. The 24 Hours calendar assumes resources can work any hour and any day of the week. The Night Shift calendar assumes working hours are Monday through Saturday, from 12:00 a.m. to 3:00 a.m., 4:00 a.m. 8 a.m., and 11 p.m. to 12 a.m. You can create a different base calendar to meet your unique project requirements.

To create a new base calendar:

1. *Open a new file and access the Change Working Time dialog box.* With Project Professional 2016 open, click the **Project** tab, and then click the **Change Working Time** button under the Properties group. The Change Working Time dialog box opens, as shown in Figure A-24.
2. *Name the new base calendar.* In the Change Working Time dialog box, click **Create New Calendar**. The Create New Base Calendar dialog box opens. Click the **Create new base calendar** radio button, type **Fiscal** as the name of the new calendar in the **Name** text box, and then click **OK**.
3. *Change the fiscal year start.* In the Change Working Time dialog box, click **Options** at the bottom of the screen. Change the **fiscal year** to start in **October** instead of January. Review other options in this screen, and then click **OK twice**.



**Figure A-24. Change Working Time dialog box**

You can use this new calendar for the whole project, or you can assign it to specific resources on the project.

To assign the new calendar to the whole project:

1. *Open the Project Information dialog box.* Click the **Project** tab, and then click the **Change Working Time** button.
2. *Select a new calendar.* Click the **For calendar** list arrow to display a list of available calendars. Select your new calendar named **Fiscal** from this list, and then click **OK**.

To assign a specific calendar to a specific resource:

1. *Assign a new calendar.* Click the **View** tab, and then click the **Resource Sheet** button under the Resource Views group. Type **Adam** in the Resource Name column, and then press **Enter**.
2. *Select the calendar.* Click the cell under the **Base** column that says **Standard** on the right part of the screen for Adam. Click the list arrow to display the options, and then select **Fiscal** as shown in Figure A-25.

Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
Adam	Work		A		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Fiscal

**Figure A-25. Changing calendars for specific resources**



3. *Block off vacation time.* Double-click the resource name **Adam** to display the Resource Information dialog box, and then click the **Change Working Time** button, located on the General tab in the Resource Information dialog box. You can block off vacation time for people by selecting the appropriate days on the calendar and marking them as nonworking days. Click **OK** to accept your changes, and then click **OK** to close the Resource Information dialog box.
4. *Close the file without saving it.* Click the **Close** box, and then click **No** when you are prompted to save the file.

## Entering Task Durations

Recall that duration includes the actual amount of time spent working on an activity plus elapsed time. Duration does not equal effort. For example, you might have an activity that you estimate will take one person 40 hours of effort to complete, but you allow two weeks on a calendar for its duration. You can simply enter 2w (for two weeks) in the Duration column for that activity (called a task in Project Professional 2016).

## Manual and Automatic Scheduling

If you have used older versions of Project, you may have noticed that when you entered an item in the Task Name column, it was automatically assigned a duration of one day, and Start and Finish dates were also automatically entered. This is still the case in Project 2016 (and Project 2013) *if* you use automatic scheduling for a task. If you use manual scheduling, no durations or dates are automatically entered. The other big change with manual scheduling is that summary task durations are not automatically calculated based on their subtasks when they are set up as manually scheduled tasks. Figure A-26 illustrates these differences. Notice that the Manual subtask 1 had no information entered for its duration, start, or finish dates. Also note that the duration for Manual summary task 1's duration is not dependent on the durations of its subtasks. For the automatic summary task, its duration is dependent on its summary tasks, and information is entered for all of the durations, start, and end dates. You can switch between automatic and manual scheduling for tasks in the same file, as desired, by changing the Task Mode.



**Figure A-26. Manual versus automatic scheduling**

When you move your mouse over the Task Mode column (shown in the far left in Figure A-26) Project Professional 2016 displays the following information:

- A task can be either Manually Scheduled or Automatically Scheduled.
- Manually Scheduled tasks have user-defined Start, Finish and Duration values. Project will never change their dates, but may warn you if there are potential issues with the entered values.
- Automatically Scheduled tasks have Start, Finish and Duration values calculated by Project based on dependencies, constraints, calendars, and other factors.

Project Help provides the following example of using both manual and automatic scheduling. You set up a preliminary project plan that's still in the proposal stage. You have a vague idea of major milestone dates but not much detail on other dates in various phases of the project. You build tasks and milestones using the Manually Scheduled task mode. The proposal is accepted and the tasks and deliverable dates

become more defined. You continue to manually schedule those tasks and dates for a while, but as certain phases become well-defined, you decide to switch the tasks in those phases to the Automatically Scheduled task mode. By letting the software handle the complexities of scheduling, you can focus your attention on those phases that are still under development.

## Duration Units and Guidelines for Entering Durations

To indicate the length of a task's duration, you normally type both a number and an appropriate duration symbol. If you type only a number, Project Professional 2016 automatically enters days as the duration unit. Duration unit symbols include:

- d = days (default)
- w = weeks
- m = minutes
- h = hours
- mo or mon = months
- ed = elapsed days
- ew = elapsed weeks

For example, to enter two weeks for a task's duration, type 2w in the Duration column. (You can also type wk, wks, week, or weeks, instead of just w.) To enter four days for a task's duration, type 4 or 4d in the Duration column. You can also enter elapsed times in the Duration column. For example, 3ed means three elapsed days, and 2ew means two elapsed weeks.

You would use an elapsed duration for a task like "Allow cement to dry." The cement will dry in exactly the same amount of time regardless of whether it is a workday, a weekend, or a holiday. Project's default calendar does not assume that work is done on weekends. You will learn to change the calendar later in this appendix.

It is important to follow a few important rules when entering durations:

- To mark a task as a milestone, enter 0 for the duration. You can also mark tasks that have a non-zero duration as milestones by checking the "Mark task as milestone" option in the Task Information dialog box on the Advanced tab. You simply double-click a task to access this dialog box. The milestone symbol for those tasks will appear at their start date.
- You can enter the exact start and finish dates for activities instead of entering durations in the automatic scheduling mode. To enter start and finish dates, move the split bar to the right to reveal the Start and Finish columns. You normally only enter start and finish dates in this mode when those dates are certain.
- If you want task dates to adjust according to any other task dates, do not enter exact start and finish dates. Instead, enter durations and then establish dependencies to related tasks.
- To enter recurring tasks, such as weekly meetings, select Recurring Task from the Task button under the Task tab, Insert group. Enter the task name, the duration, and when the task occurs. Project Professional 2016 will automatically insert appropriate subtasks based on the length of the project and the number of tasks required for the recurring task.
- Remember to change the default calendar if needed, as shown earlier.

Next, you will set task durations in the file that you created and saved in the previous section. If you did not create the file named 2016wbs.mpp, you can download it from the companion Website for this text.

Use the information in Figure A-27 to enter durations. The Project Professional 2016 row number is shown to the left of each task name in the table.

<b>Task Row</b>	<b>Task Name</b>	<b>Duration</b>
2	Stakeholder identification	1w
3	Stakeholder register completed	0
4	Stakeholder management strategy completed	0
5	Project charter	1w
6	Project charter completed	0
7	Kickoff meeting	3d
8	Kickoff meeting completed	0
10	Schedule	5d
11	Gantt chart completed	0
12	Scope statement	8d
13	Initial scope statement completed	0
16	Activity D1	4w
17	Activity D2	6w
18	Deliverable 1 completed	0
19	Deliverable 2	3w
20	Deliverable 3	5w
24	Progress report 1	0
25	Progress report 2	0
28	Final project report	4d
29	Final presentation	4d
30	Project completed	0

**Figure A-27. Task durations**

## Entering Task Durations

To enter task durations:

1. *Enter the duration for Task 2.* Open the **2016wbs** file, and move the split bar to the right, if needed, to reveal the Duration, Start, and Finish columns. Click the **Duration** column for row 2, Stakeholder identification, type **1w**, and then press **Enter**. Notice that the duration for the first task, Initiating, also changed since it is a summary task and is an Automatically scheduled task, as shown in the **Task Mode** column. When you created summary tasks earlier, the software changed their scheduling mode to Automatic. Also notice that the Start and Finish date for Task 2 remain blank, since that task is a Manually scheduled task.
2. *Enter the duration for Task 3.* In the **Duration** column for row 3, Stakeholder register completed, type **0**, and then press **Enter**. Remember that a task with zero duration is a milestone. Notice the milestone or diamond symbol next to the date 8/1 that appears on the Gantt chart, as shown in Figure A-28. Remember that you can adjust the Task Name column width to see all of the text and use the Zoom slider to change the length of the Gantt chart bars.

### Task Mode column

Task Mode	Task Name	Duration	Start	Finish
	2016wbs	5 days	Mon 8/1/16	Fri 8/5/16
	1 Initiating - Kathy Schwalbe	5 days	Mon 8/1/16	Fri 8/5/16
	1.1 Stakeholder identification	1 wk		
	1.2 Stakeholder register completed	0 days		

Figure A-28.

### Entering task durations

3. *Make all tasks automatically scheduled tasks.* To save time because you do not want most of the tasks to be automatically scheduled, select all of the tasks by clicking the **Task Name** column heading, and then click the **Auto Schedule** button under the **Task** tab, as shown in Figure A-29. Most of the durations change to 1.
4. *Enter remaining task durations.* Continue to enter the durations using the information in Figure A-27 or Figure A-30. Do not enter durations for tasks not listed in the figure. Notice that the Planning Wizard dialog box displays when you make the same entry several times in a row, such as after task 20. Click OK to close the dialog box. You can adjust the column widths and Zoom, if desired.

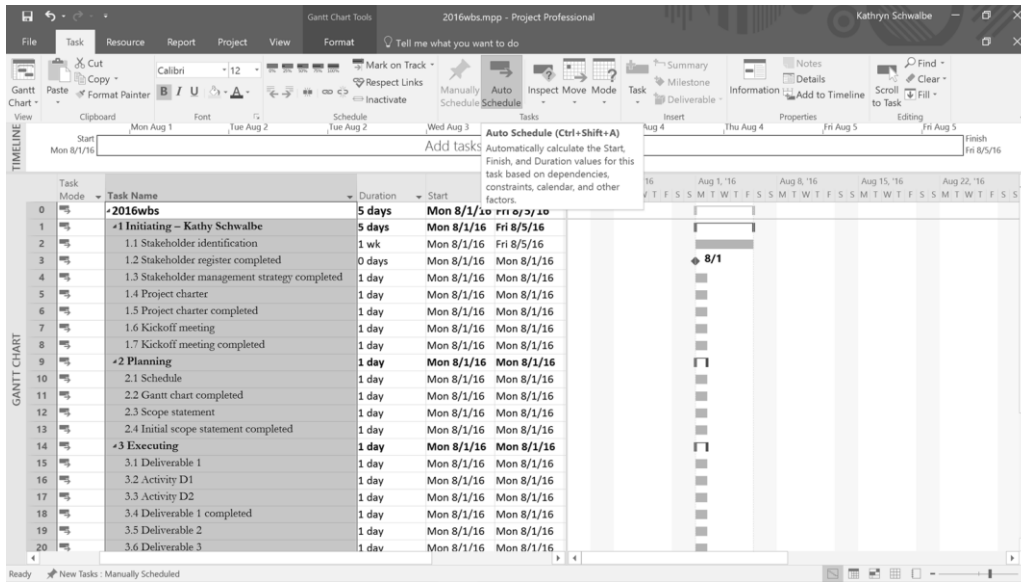


Figure A-29. Auto scheduling tasks

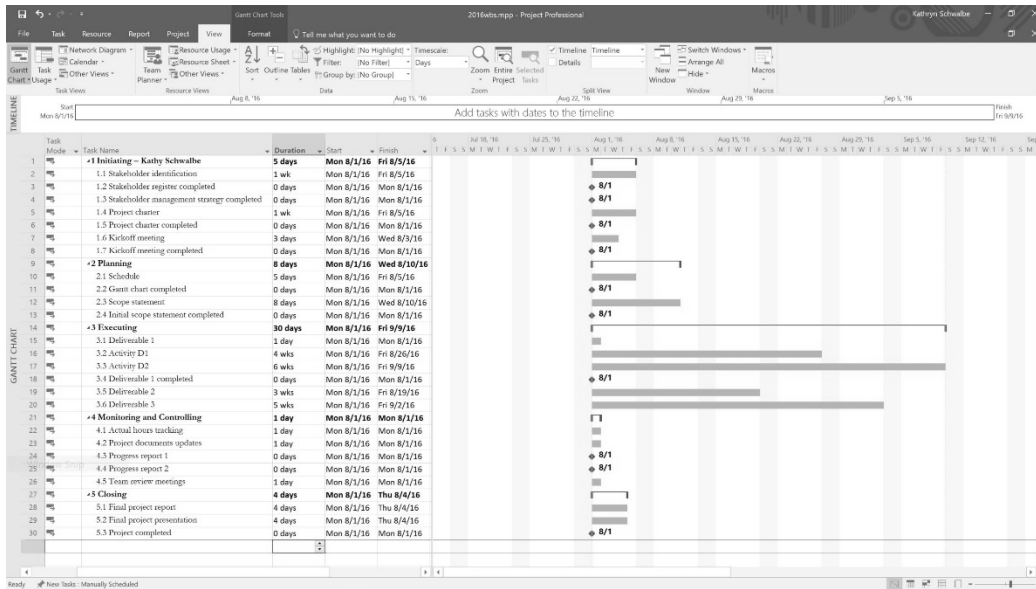
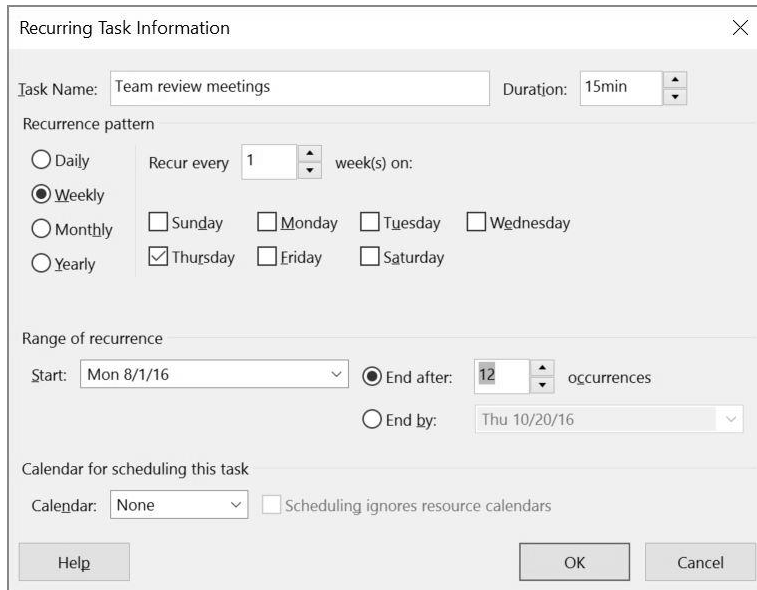


Figure A-30. Entering more durations

5. Insert a recurring task above Task 26, Team meetings. Click **Team review meetings** (Task 26) in the Task Name column to select that task. Click the **Task** tab, and click the **Task** button drop-down box, and then click **Recurring Task**. The Recurring Task Information dialog box opens.
6. Enter task and duration information for the recurring task. Type **Team review meetings** as the task title in the Task Name text box. Type **15min** in the Duration text box. Select the **Weekly** radio button under Recurrence pattern. Make sure that **1** is entered in the **Recur every** list box. Select the **Thursday** check box. In the Range of recurrence section, click the **End after** radio button, and then type **12** in the occurrences text box, as shown in Figure A-31. The new recurring tasks will appear indented below Task 26 when you are finished.
7. Delete row 39 to avoid redundancy. Right-click on row 39, then click **Delete Task**.

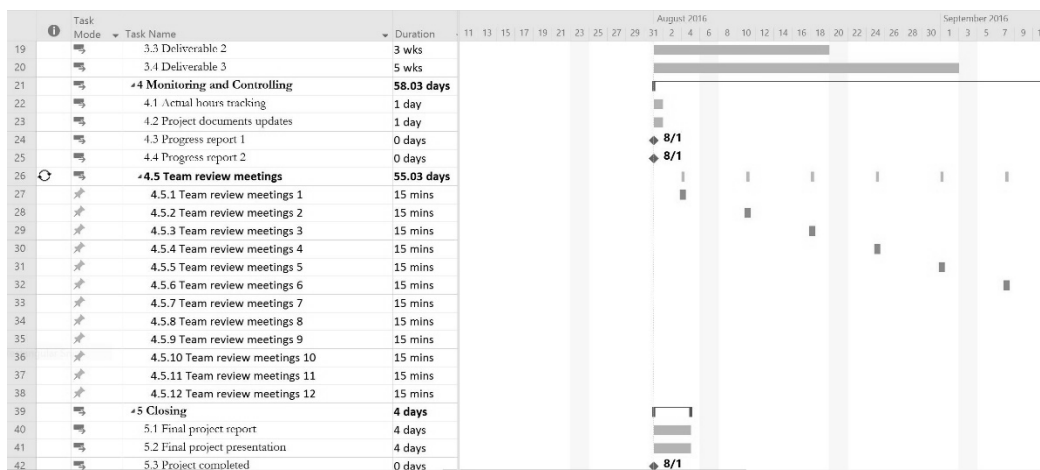


**Figure A-31. Recurring task information dialog box**

**TIP:** You can also enter End by date for a recurring task instead of a number of occurrences. You might need to adjust the entry after you enter all of your task durations and dependencies.

8. *View the new summary task and its subtasks.* Click **OK**. Project Professional 2016 inserts 12 team review meetings subtask in the Task Name column. Notice that the recurring tasks appears on the appropriate dates on the Gantt chart.

9. *Adjust the columns displayed and the timescale.* Move the **split bar** so that only the Task Name and Duration columns are visible, if needed. Click the **Zoom Out** button on the Zoom slider in the lower left of the screen to display all of the symbols in the Gantt chart. Your screen should resemble Figure A-32.



**Figure A-32. All task durations and recurring task entered**

10. *Save your file and name it.* Click **File** on the Menu bar, and then click **Save As**. Enter **2016schedule** as the filename, and then save the file to the desired location on your computer or network. Notice that all non-recurring tasks still begin on 8/1/16. This will change when you add task dependencies. Keep this file open for the next set of steps.

## *Establishing Task Dependencies*

To use Project Professional 2016 to adjust schedules automatically and perform critical path analysis, you *must* determine the dependencies or relationships among tasks. There are several different methods for creating task dependencies: using the Link Tasks button, using the Predecessors column of the Entry table or the Predecessors tab in the Task Information dialog box, or clicking and dragging the Gantt chart symbols for tasks with dependencies. You will use the first two methods in the following steps.

To create dependencies using the Link Tasks button, highlight tasks that are related and then click the Link Tasks button under the Task tab, Schedule group. For example, to create a finish-to-start (FS) dependency between Task 1 and Task 2, click any cell in row 1, drag down to row 2, and then click the Link Tasks button. The default type of link is finish-to-start. In the following steps, you will also set up some other types of dependencies and use the lag option to set up overlaps between dependent tasks.

**TIP:** To select adjacent tasks, click and drag the mouse to highlight them. You can also click the first task, hold down the Shift key, and then click the last task. To select nonadjacent tasks, hold down the Control (Ctrl) key as you click tasks in order of their dependencies.

When you use the Predecessors column of the Entry table to create dependencies, you must manually enter the information. To create dependencies manually, type the task row number of the preceding task in the Predecessors column of the Entry table. For example, Task 3 has Task 2 as a predecessor, which can be entered in the Predecessors column, meaning that Task 3 cannot start until Task 2 is finished. To see the Predecessors column of the Entry table, move the split bar to the right. You can also double-click on the task, click the Predecessors tab in the Task Information dialog box, and enter the predecessors there.

Next, you will enter the predecessors for tasks as indicated. You will create some dependencies by manually typing the predecessors in the Predecessors column, some by using the Link Tasks button, and the remaining dependencies by using whichever method you prefer.

To link tasks or establish dependencies:

1. *Display the Predecessors column in the Entry table.* Move the split bar to the right to reveal the full Predecessors column in the 2016schedule.mpp file you saved in the previous section. Widen the Task Name or other columns, if needed.
2. *Highlight the cell where you want to enter a predecessor, and then type the task number for its predecessor task.* Click the **Predecessors cell for Task 3**, Stakeholder register completed, type **2**, and press **Enter**. Notice that as you enter task dependencies, the Gantt chart changes to reflect the new schedule. Also notice that several cells become highlighted, showing *the Visual Change Highlights feature of Project 2016*.
3. *Enter predecessors for Task 4 and view the Task Path.* Click the **Predecessors cell for Task 4**, type **2**, and press **Enter**. Click the **Format** tab, and then click the **Task Path** button under the Bar Styles group. Experiment with the options to highlight Predecessor, Driving Predecessors, Successors, and Driven Successors, and then click **Remove Highlighting**. Click the **Tasks** tab.
4. *Establish dependencies using the Link Tasks button.* To link Tasks 5 and 6, click the **task name for Task 5** in the Task Name column and drag down through **Task 6**. Then, in the **Task** tab, click the **Link Tasks** button (**looks like a chain link**) under the Schedule group. Notice that the result is the same as typing 5 in the Predecessors column for Task 6, as shown in Figure A-33.

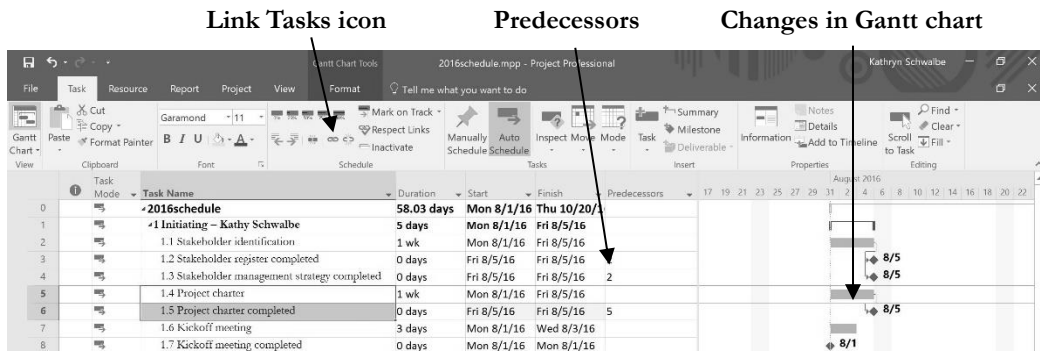


Figure A-33. Entering predecessors

5. Enter dependencies and lag time using the Task Information dialog box. Double-click on the **Task Name** for **Task 5**, Project charter, and then click on the **Predecessors** tab in the Task Information dialog box. Click in the cell under Task Name, and then click the **Task Name** down arrow and select **Stakeholder identification**. Click the **Type** drop down arrow to see the various types of dependencies. For this task, you will keep the default type of *finish-to-start*. Click the **cell under the Lag** column, then **type -50%** and press **Enter**. (Lag means there is a gap between tasks, and lead or negative lag means there is an overlap). Your screen should resemble Figure A-34. Click **OK** to close the dialog box. Notice that the Predecessor column for task 5 displays 2FS-50%, meaning there is a finish-to-start relationship with task 2 and a lag of -50%, meaning the task can start when task 2 is 50% completed.

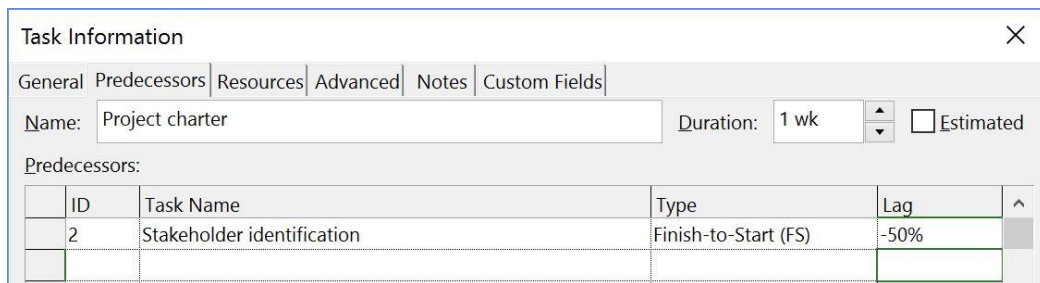


Figure A-34. Entering predecessor information using the task information dialog box

6. Enter remaining dependencies. **Link the other tasks** by either manually entering the predecessors into the Predecessors column, by using the Link Tasks button, or using the Task Information dialog box. Use the information in Figure A-35 to make your entries, being careful to leave some of the predecessors blank, as shown. If you have entered all data correctly, the project should end on 11/11, or November 11, 2016.



Task Row	Task Name	Predecessors
3	Stakeholder register completed	2
4	Stakeholder management strategy completed	2
5	Project charter	2FS-50%
6	Project charter completed	5
7	Kickoff meeting	2,6
8	Kickoff meeting completed	6,7
9	Planning	
10	Schedule	5,12FS-50%
11	Gantt chart completed	10
12	Scope statement	5
13	Initial scope statement completed	12
14	Executing	
15	Deliverable 1	
16	Activity D1	12
17	Activity D2	12
18	Deliverable 1 completed	16, 17
19	Deliverable 2	18
20	Deliverable 3	18
21	Monitoring and Controlling	
22	Actual hours tracking	2
23	Project documents updates	3
24-39	Progress Report 1 through Closing	
40	Final project report	20
41	Final presentation	20
42	Project completed	40, 41

**Figure A-35. Predecessor information**

7. *Adjust several dates.* You know that you have to deliver the two progress reports on specific dates. Click on the **Start dates for Tasks 24 and 25** and change those dates to September 2 and October 7. Also change the **Finish dates for tasks 22 and 23** to November 10 to be more realistic. Project 2016 will display a yellow warning symbol to remind you that you are changing default dates, which is fine in these examples.

8. *Review the file.* If needed, click the **Zoom Out** button on the Zoom slider to adjust the timescale so all of the information shows on your screen. Collapse the recurring tasks for the Team review meetings. When you finish, your screen should resemble Figure A-36. Double-check your screen to make sure you entered the dependencies correctly.

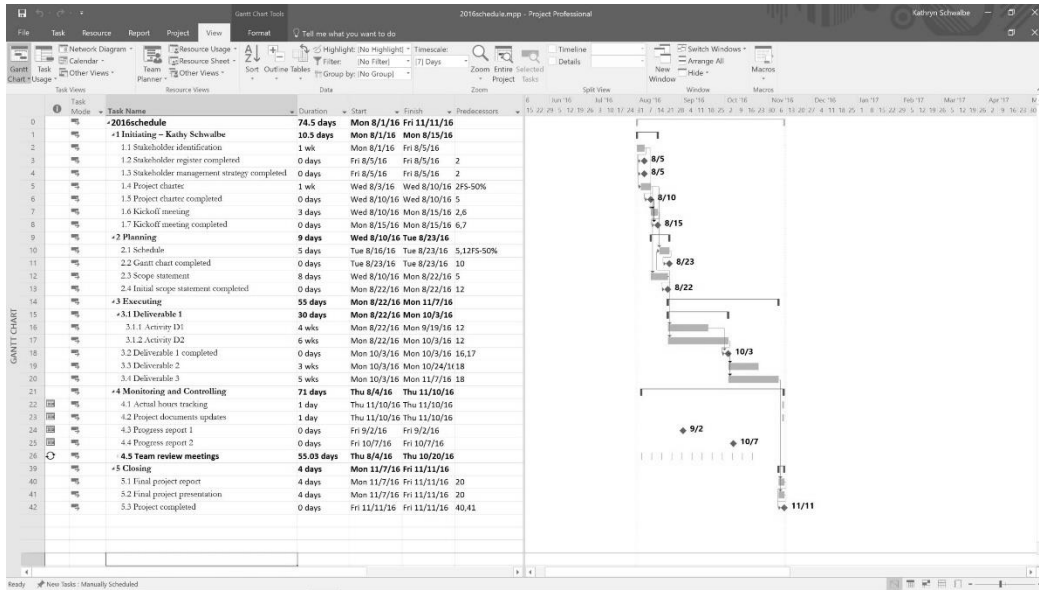


Figure A-36. File with durations and dependencies entered

9. *Preview and save your file.* Click the **File** tab, and then select **Print to preview and print your file**. Click **Page Setup**, and then click the option to **Fit to 1** so it will print on one page, as shown in Figure A-37. Be careful before printing any Project 2016 files so you do not waste a lot of paper. When you are finished, click **Save** to save your file again. Keep the file open for the next set of steps.

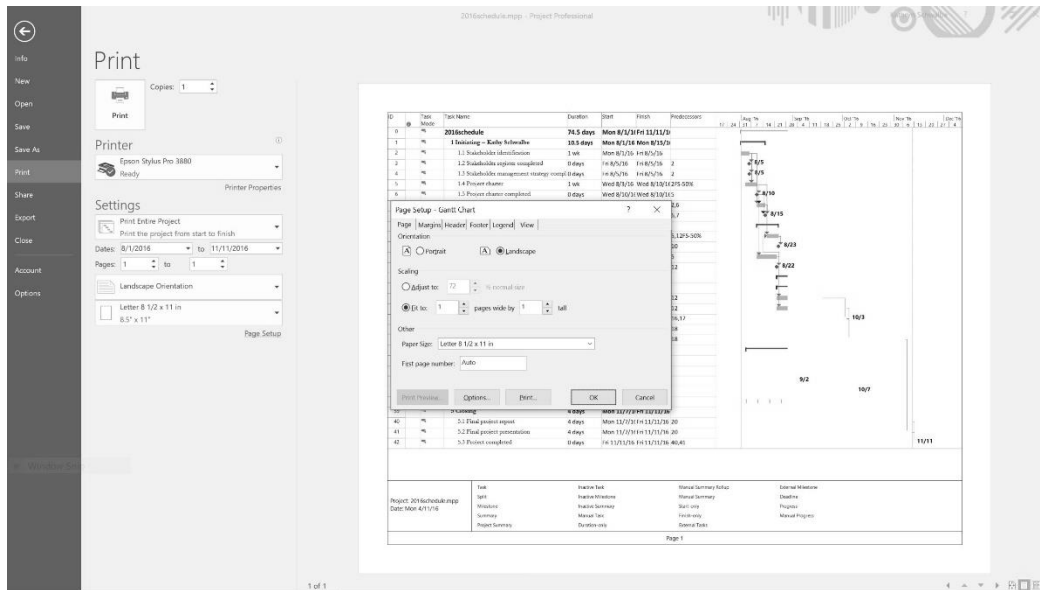


Figure A-37. File set up to print on one page

## Gantt Charts, Network Diagrams, and Critical Path Analysis

Project Professional 2016 shows a Gantt chart as the default view to the right of the Entry table. As described earlier in this text, network diagrams are often used to show task dependencies. This section explains important information about Gantt charts and network diagrams and describes how to make critical path information more visible in the Gantt Chart view.

Because you have already created task dependencies, you can now find the critical path. You can view the critical tasks by changing the color of those items in the Gantt Chart view. Tasks on the critical path will automatically be red in the Network Diagram view. You can also view critical path information in the Schedule table or by using the Critical Tasks report.

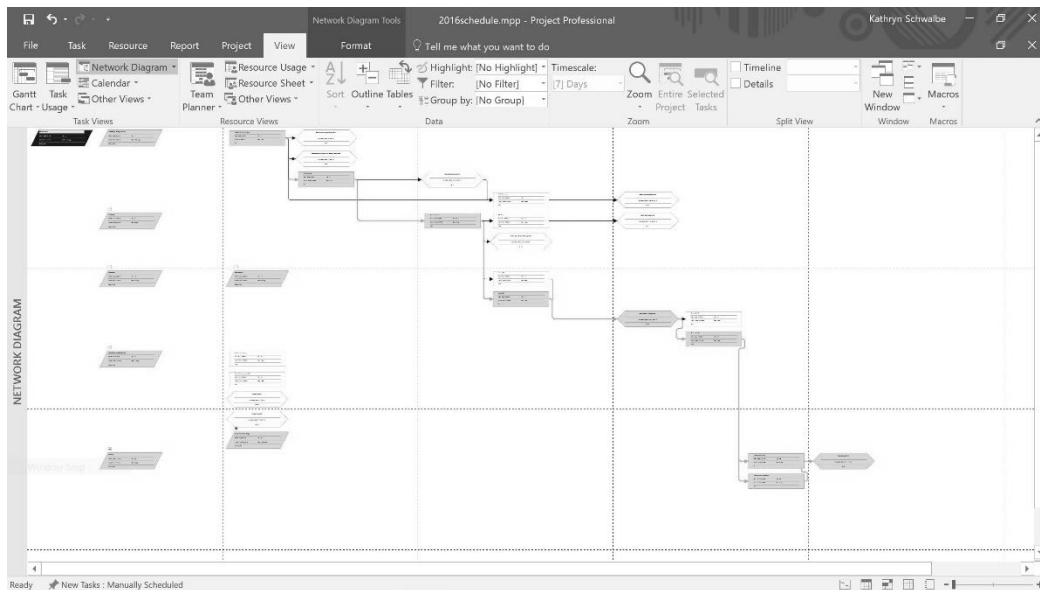
To make the text for the critical path tasks appear in red on the Gantt chart:

1. *Change the critical tasks format.* Using the `2016schedule.mpp` file you previously saved, click the **Format** tab, and then click the **Critical Tasks** check box in the Bar Styles group, as shown in Figure A-38. Notice that the critical tasks display in red in the Gantt chart. You can also quickly change the Gantt Chart Style by clicking one of those options.



**Figure A-38. Formatting critical tasks**

2. *View the network diagram.* Click the View tab, and then click the **Network Diagram** button under the Task Views group. Click the **Zoom Out** button on the Zoom slider several times and watch the view change. Figure A-39 shows all of the tasks in the network diagram. Note that milestone tasks, such as Stakeholder management strategy completed, the fourth box on the top, appear as pointed rectangular boxes, while other tasks appear as rectangles. Move your mouse over that box to see it in a larger view. Notice that tasks on the critical path automatically appear in red. A dashed line on a network diagram represents a page break. You often need to change some of the default settings for the Network Diagram view before printing it. As you can see, network diagrams can be messy, so you might prefer to highlight critical tasks on the Gantt chart as you did earlier for easier viewing.



**Figure A-39. Network diagram view**

3. *View the schedule table.* Click the **Gantt Chart** button under the **View** tab to return to Gantt Chart view. Right-click the **Select All** button to the left of the Task Mode column heading and select **Schedule**. Alternatively, you can click the **View** tab and click the **Tables** button under the Data group and then select **Schedule**. The Schedule table replaces the Entry table to the left of the Gantt Chart. Your screen should resemble Figure A-40. This view shows the start and finish (meaning the early start and early finish) and late start and late finish dates for each task, as well as free and total slack. Right-click the **Select All** button and select **Entry** to return to the Entry table view.

Select All button      Schedule table

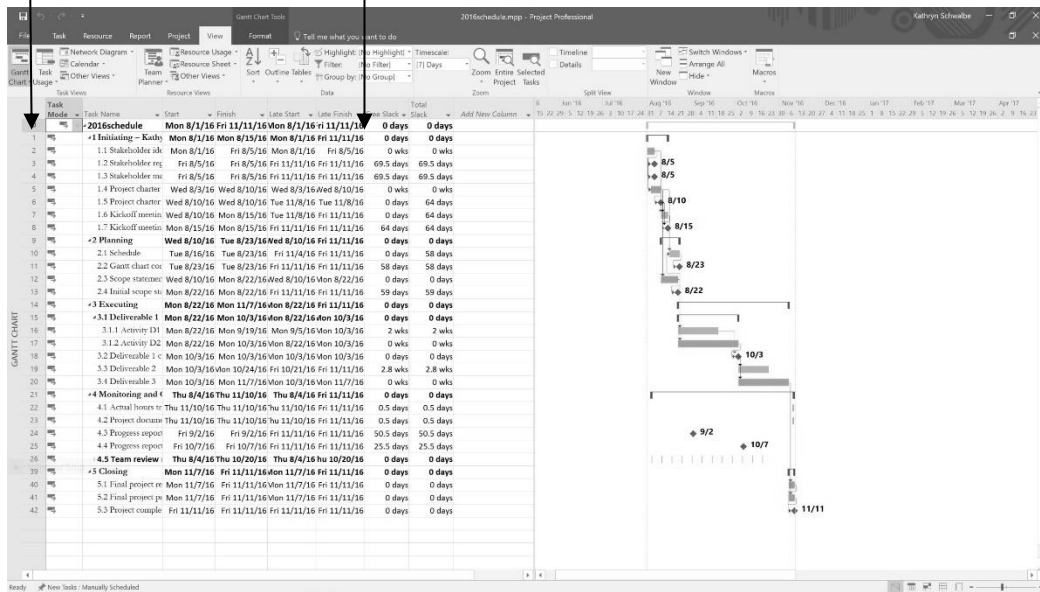


Figure A-40. Schedule table view

4. *Open the Project Overview report.* Click the **Report** tab, and click the **Dashboards** button under the **View Reports** group, and then click **Project Overview** to open the Overview Reports, as shown in Figure A-41. Note that the report shows the milestones due and % complete. Examine other reports, as desired.
5. *Close the report and save your file.* When you are finished examining the reports, return to the Gantt chart view, and then click the **Save** button on the Quick Access toolbar to save your final 2016schedule.mpp file, showing the Entry table and Gantt chart view. Close Project 2016 if you are not continuing to the next section.

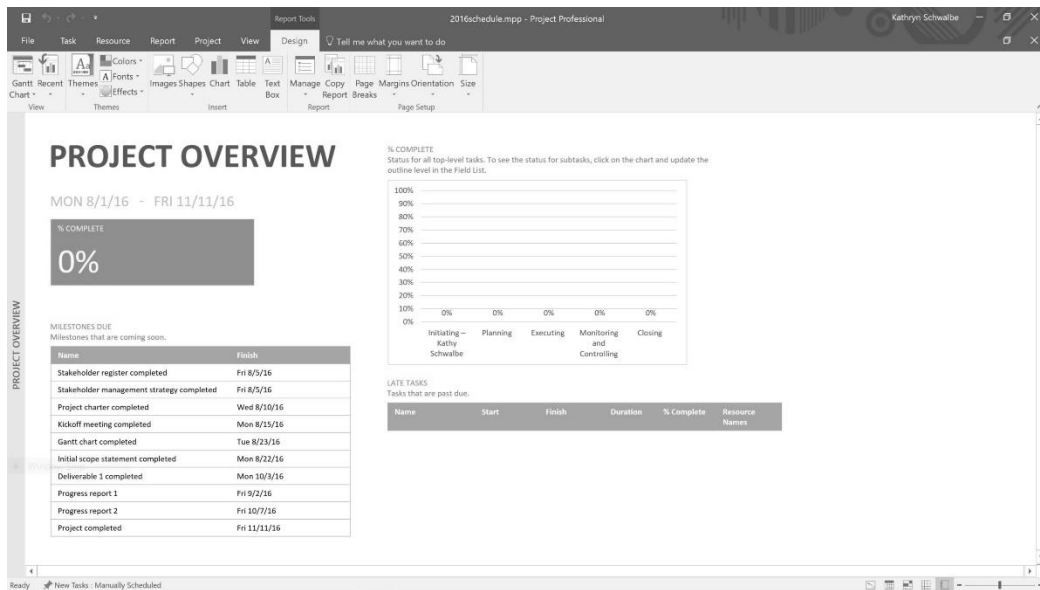


Figure A-41. Project Overview report

**HELP:** If you want to download the file 2016schedule.mpp to check your work or continue to the next section, a copy is available on the companion Website for this text at [www.intropm.com](http://www.intropm.com).

Next you will explore some of the cost and resource management features of Project Professional 2016.

## PROJECT COST AND RESOURCE MANAGEMENT

Many people do not use Project Professional 2016 for cost or resource management. Some organizations have more established cost management software products and procedures in place, and many people simply do not know how to use the cost or resource management features. However, these features make it possible to integrate total project information more easily. This section offers brief instructions for entering fixed and variable cost estimates, assigning resources to tasks, viewing resource histograms, and entering actual cost and schedule information after establishing a baseline plan. It also explains how to use Project Professional 2016 for earned value management. More details on these features are available in Project Help, online tutorials, or other texts. See other chapters of this text for information on some of these concepts.

### *Entering Fixed and Variable Cost Estimates*

You can enter costs as fixed or variable. Fixed costs include costs like a specific quantity of materials or costs for consultants hired at a fixed cost. Variable costs vary based on the amount of materials or hours people work. On many projects, human resource costs are the largest percentage of total project costs.

### Entering Fixed Costs in the Cost Table

The Cost table allows you to easily enter fixed costs related to each task. You will enter a fixed cost of \$200 related to Task 15, Deliverable 1.

To enter a fixed cost:

1. *Display the Cost Table view.* Open the file 2016schedule.mpp, if necessary. Right-click the **Select All** button to the left of the Task Mode column heading and select **Cost**. The Cost table replaces the Entry table to the left of the Gantt chart. **Widen** the Task Name column and then move the **Split bar** to the right, as needed, until you see the entire Cost table.
2. *Enter a fixed cost.* In the **Fixed Cost column for Task 16**, Activity D1, type **200**, and press **Enter**. Notice that the Total Cost and Remaining Cost columns reflect this entry, and changes are made to several summary tasks and the entire project as well. Your screen should resemble Figure A-42.

Select All button Fixed Cost column of cost table

Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
2016schedule	\$0.00	Prorated	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
1 1 Initiating – Kathy Schwalbe	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2 1.1 Stakeholder identification	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
3 1.2 Stakeholder register completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
4 1.3 Stakeholder management strategy completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
5 1.4 Project charter	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
6 1.5 Project charter completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
7 1.6 Kickoff meeting	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
8 1.7 Kickoff meeting completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
9 2 Planning	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
10 2.1 Schedule	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
11 2.2 Gantt chart completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
12 2.3 Scope statement	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
13 2.4 Initial scope statement completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
14 3 Executing	\$0.00	Prorated	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
15 3.1 Deliverable 1	\$0.00	Prorated	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
16 3.1.1 Activity D1	\$200.00	Prorated	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
17 3.1.2 Activity D2	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18 3.2 Deliverable 1 completed	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
19 3.3 Deliverable 2	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
20 3.4 Deliverable 3	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Figure A-42. Entering a fixed cost

## Entering Resource Information and Cost Estimates

Several methods are available for entering resource information in Project Professional 2016. The Resource Sheet allows you to enter the resource name, initials, resource group, maximum units, standard rate, overtime rate, cost/use, accrual method, base calendar, and code. Once you have established resources in the Resource Sheet, you can assign those resources to tasks in the Entry table with the list arrow that appears when you click a cell in the Resource Names column. The Resource Names column is the last column of the Entry table. You can also use other methods for assigning resources, such as using the Assign Resources button or using the split window, which is the recommended approach to have the most control over how resources are assigned because Project Professional 2016 makes several assumptions about resources assignments that might mess up your schedule or costs. Next, you will enter information for three people and assign them to a few tasks using various methods.

To enter basic information about each person into the Resource Sheet and assign them to tasks using the Entry table and toolbar:

1. *Display the Resource Sheet view.* Click the **View** tab, and then click the **Resource Sheet** button under the Resource Views group.
2. *Enter resource information.* Enter the information from Figure A-44 into the Resource Sheet. The three resources names are **Kathy, Dan, and Scott**. The Std. Rate and Ovt. Rate for Kathy is **40**, and the Std. and Ovt. Rates for Dan and Scott are **30**. Type the information as shown and press the **Tab** key to move to the next field. When you type the standard and overtime rates, you can just type the number, such as 40, and Project Professional 2016 will automatically enter \$40.00/hr. The standard and overtime rates entered are based on hourly rates. You can also enter annual salaries by typing the annual salary number followed by /y for “per year.” Your screen should resemble Figure A-43 when you are finished entering the resource data.

Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
Kathy	Work		K		100%	\$40.00/hr	\$40.00/hr	\$0.00	Prorated	Standard
Dan	Work		D		100%	\$30.00/hr	\$30.00/hr	\$0.00	Prorated	Standard
Scott	Work		S		100%	\$30.00/hr	\$30.00/hr	\$0.00	Prorated	Standard

**Figure A-43. Resource sheet view with resource data entered**

**TIP:** If you know that some people will be available for a project only part time, enter their percentage of availability in the Max Units column of the Resource Sheet. Project Professional 2016 will then automatically assign those people based on their maximum units. For example, if someone can work only 50% of his or her time on a project throughout most of the project, enter 50% in the Max Units column for that person. When you enter that person as a resource for a task, his or her default number of hours will be 50% of a standard eight-hour workday, or four hours per day. You can also enter the number of hours each person is scheduled to work, as shown later.

3. *Assign resources to tasks.* From the **View** tab, select the **Gantt Chart** button under the Task Views group, and then click the **Select All** button and switch back to the **Entry** table. Move the Split bar to reveal the Resource Names column, if needed.
4. *Assign Kathy to task 2, Stakeholder identification.* Click in the **Resource Names** cell for **row 2**. Click the list arrow, click on the **checkbox** by **Kathy**, and then press **Enter** or click on another cell. Notice that the resource choices are the names you just entered in the Resource Sheet. Also notice that after you select a resource by checking the appropriate checkbox, his or her name appears on the Gantt chart, as shown in Figure A-44. To assign more than one resource to a task using the list arrow, simply select another checkbox. Note that Project Professional 2016 will assume that each resource is assigned full-time to tasks using this method since the task is in automatically schedule mode. Also note that you can use filter by Resource Names to only show tasks assigned to specific resources after you enter the resources.

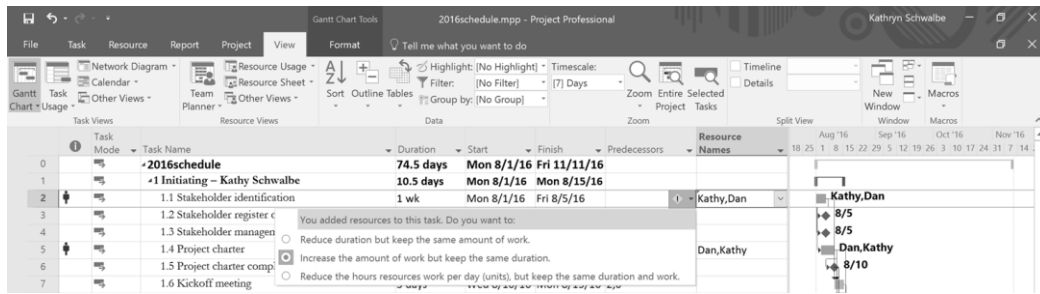
**Filter Resource Names**

Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
0	2016schedule	74.5 days	Mon 8/1/16	Fri 11/11/16		
1	1 Initiating – Kathy Schwalbe	10.5 days	Mon 8/1/16	Mon 8/15/16		
2	1.1 Stakeholder identification	1 wk	Mon 8/1/16	Fri 8/5/16		Kathy
3	1.2 Stakeholder register completed	0 days	Fri 8/5/16	Fri 8/5/16	2	
4	1.3 Stakeholder management strategy completed	0 days	Fri 8/5/16	Fri 8/5/16	2	

**Figure A-44. Resource assigned using the entry table**

5. *Assign two resources to a task.* Click in the **Resource Names** cell for **row 5 (Project charter)**. Click the **list arrow**, then click on the **checkbox** by **Dan and Kathy**, and then press **Enter**. Notice that both resource names appear in the Resource Names column and on the Gantt chart for this task, and the task duration remains at 1 week.
6. *Change the resource assignments.* Click in the **Resource Names** cell for **Task 2, Stakeholder identification**, click the **list arrow**, and add **Dan** as another resource. Notice that when you change an original resource assignment, Project prompts you for how you want to handle the change, as shown in Figure A-45. Click the **Exclamation point** symbol to read your options. In past versions of Project Professional, resource additions would change schedules automatically unless the user entered them a certain way. Now you have much more control of what happens to your schedule and costs. In this case, we do want to accept the default of keeping the duration constant.





**Figure A-45. Options when additional resources are added to tasks**

7. *Review the cost table.* Right-click the **Select All** button to the left of the Indicators column heading and select **Cost**. Notice that costs have been added to the tasks where you added resources. Project assumes that people are assigned full-time to tasks. It is showing a cost of \$2,800 each for Task 2 and Task 5. In the next section, you will see how to control resources entries even more. First, right-click the **Select All** button and select **Entry** to return to the Entry table.

To control resource and work assignments using the Resource details window:

1. *Open the Resource Form.* Notice the **red symbols in the Indicator columns** for rows/tasks 2 and 5. Move your mouse over the symbol to read the message about resources being overallocated. Click the Task Name for row 2, Stakeholder identification, click the **Resource** tab, and then click on the **Details** button under the **Properties** group. A Resource Form is displayed at the bottom of the screen, as shown in Figure A-46. Project Professional 2016 assumes every task is assigned full-time, so since Kathy is scheduled on two tasks on the same day, it says she is overallocated.

**TIP:** You can right-click on the lower screen to see additional forms/views. You can click the Select All button at the top right of the screen to view different tables at the top of the screen. You want to make sure that resource and work hour assignments do not adjust your schedules in ways you did not intend.

2. *Make tasks 2 and 5 manually scheduled.* Click the drop-down in the **Task Mode** column for Tasks 2 and 5 to make them **manually scheduled**. When you assigned resources, Project Professional 2016 assumed they were working full-time or 40 hours per week on each task. Because these two tasks have days that overlap, there is an overallocation. You do not expect each resource to work that many hours, so you can change them by using the Resource Form.

3. *Change the number of Work hours.* Select Task 2, **Stakeholder identification** in the top window, and then click the **Work** column in the Resource Form window for **Kathy** in the lower part of your screen. Type **10h**, press **Enter**, and again type **10h** and press **Enter** for the next task, Task 5, Project charter, and then click the **OK** button. Click **Next** to see Dan's Resource Form.

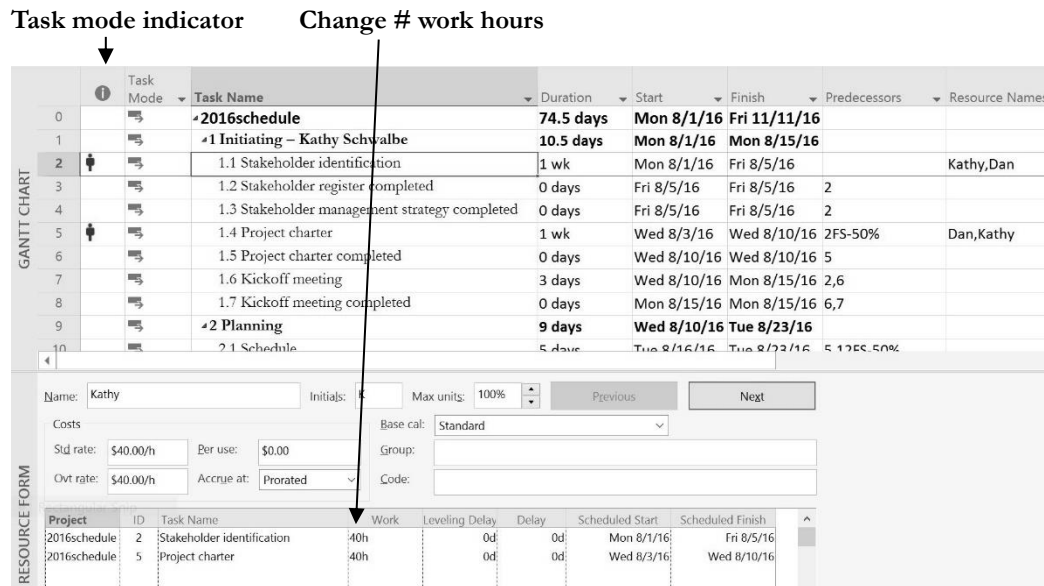


Figure A-46. Changing Work hours for tasks

4. Enter additional work hours and review the Gantt chart. Change Dan's work hours to **10h for Tasks 2 and 5** as well. Notice in the Gantt chart that the duration for Tasks 2 and 5 are still one week. The overallocation indicator should now disappear because the number of hours has been reduced from the default of 8 hours per day, or 40 hours for a 5-day task. To remove the Resource Form, click **Details** on the Ribbon under the Resource tab.
5. Examine the new cost information. Click the Select All button, and then click **Cost** to view the Cost table. Tasks 2 and 5 each show only \$700 for Total Cost.
6. Close the file without saving it. Close the file, but do not save the changes you made.

## Using the Team Planner Feature

Another way to assign resources and reduce overallocations is by using the Team Planner feature. Assume you have two people assigned to work on a project, Brian and Cindy, as shown in Figure A-47. Notice that Brian is assigned to work on both Task 1 and Task 2 full-time the first week. Therefore, Brian is overallocated. Cindy is scheduled to work on Task 3 full-time the second week, and Task 4, also scheduled for the second week, is not assigned yet.

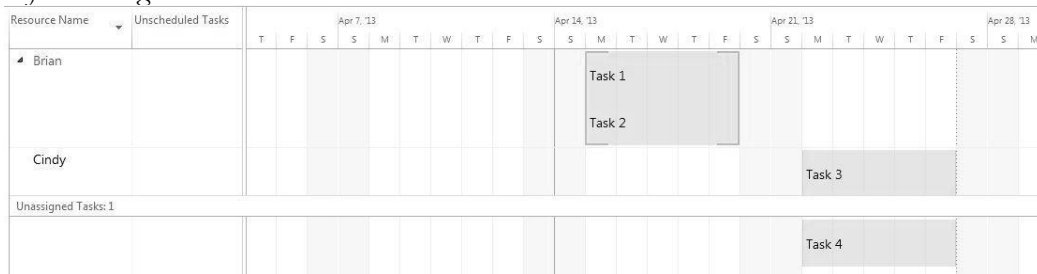
## Overallocation indicator



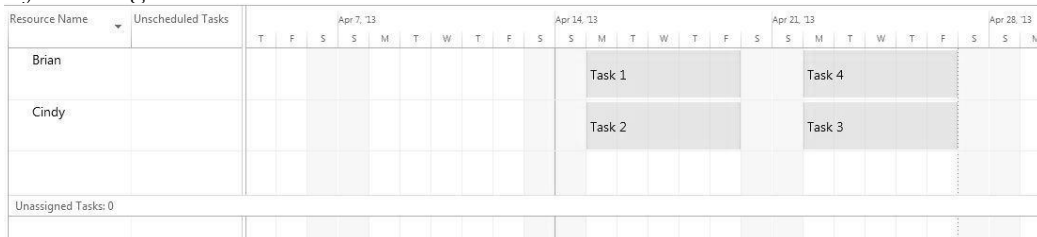
**Figure A-47. Overallocated resource**

You can click on the Team Planner view under the View tab to see a screen similar to the top section of Figure A-48. Notice that Brian has both Tasks 1 and 2 assigned to him at the same time. These tasks and Brian's name display in red to show the overallocation. Cindy is assigned Task 3 the following week, and Task 4 is unassigned. By simply clicking and dragging Task 4 straight up so it is under Brian in Week 2 and Task 2 straight down so it is under Cindy in Week 1, you can reassign those tasks and remove Brian's overallocation, as shown in the bottom section of Figure A-48. Many people will appreciate the simplicity of this feature, first introduced in Project 2010!

*Before moving tasks in the Team Planner View:*



*After moving tasks in the Team Planner View:*



**Figure A-48. Adjusting resource assignments using the Team Planner feature**

## Using the New Resource Engagement Feature

If you are using Project Professional 2016 with Project Online, then you can take advantage of the new resource engagement feature. Figure A-49 shows the Help screen explaining how it works.

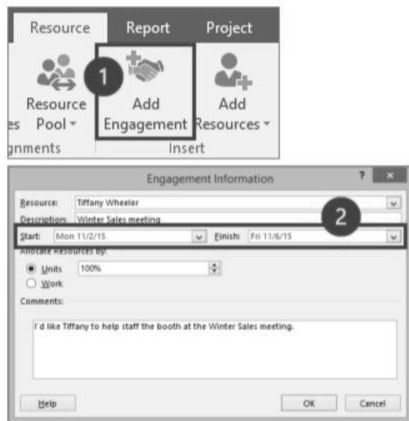
### Better control over resource scheduling

Some resources have limited availability, and may have their time scheduled by a resource manager. With Project Professional 2016 and Project Online, project managers and resource managers can negotiate an agreement, called a **resource engagement**, to make sure that resources are being used appropriately and effectively throughout your organization.

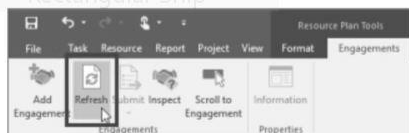
**IMPORTANT:** Resource engagements only work if you're using Project Professional 2016 or Project Pro for Office 365, connected to Project Online. If you are not connected to Project Online, the resource engagements functionality will be hidden from view. Project Standard 2016 does not include resource engagements.

**How does it work?** When a resource manager sets up the enterprise resource pool in Project Online, he or she can identify some resources as requiring approval to be assigned to projects.

When a project manager decides to use one of these resources on a project, he or she submits an engagement request with the date range for when the resource is needed, and either a certain percentage of that resource's time during that date range, or a set number of hours during that date range.



The resource manager reviews this request, and can accept it, suggest changes, or reject it. The project manager refreshes the engagement status in the **new Resource Plan view** in Project Professional 2016 to see the resource manager's response.



Once the engagement is finalized, the project manager has the go-ahead to assign that resource to tasks in the project.

**Figure A-49.** Using the resource engagement feature

## *Entering Baseline Plans, Actual Costs, and Actual Times*

After entering information in the Task Name column, establishing task durations and dependencies, and assigning costs and resources, you are ready to establish a baseline plan. By comparing the information in your baseline plan to actual progress during the course of the project, you can identify and solve problems. After the project ends, you can use the baseline and actual information to plan similar, future projects more accurately. To use Project Professional 2016 to help control projects and view earned value information, you must establish a baseline plan, enter actual costs, and enter actual durations. In the next series of steps you will use a new file called 2016actuals.mpp that you downloaded from the companion Website for this text ([www.intropm.com](http://www.intropm.com)).

To save a file as a baseline and enter actual information:

1. *Open the file called 2016actuals.mpp.* The file should be showing the Cost table view. Notice that this short project was planned to start on January 7, 2013 and end on February 13 of the same year, have three resources assigned to it, and cost \$11,200. Click the **Project** tab, click the **Set Baseline** button under the Schedule group, and click **Set Baseline**. Your screen should resemble Figure A-50.

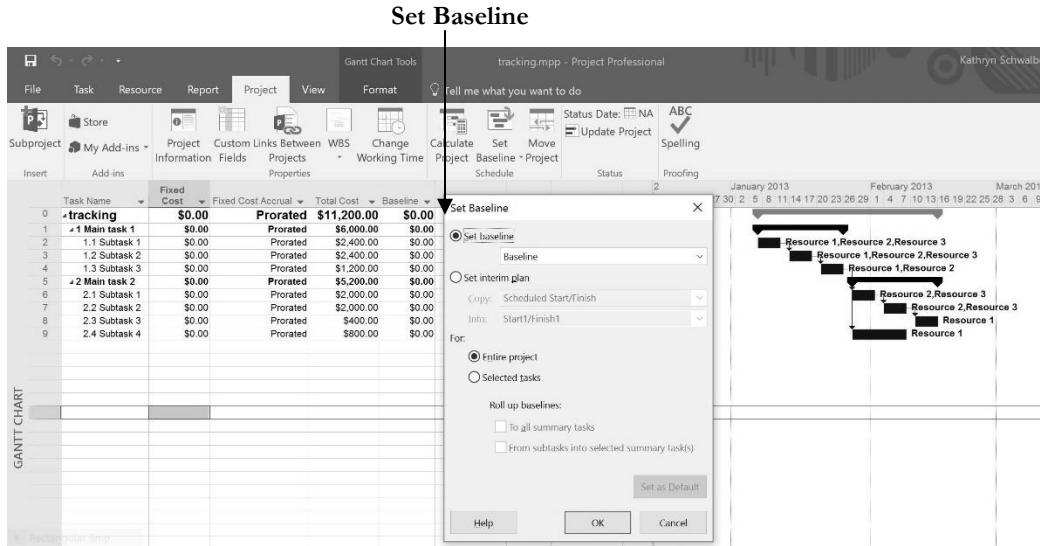


Figure A-50. Saving a baseline

2. *Save the file as a baseline.* Examine the **Set Baseline** dialog box. Click the drop-down arrow to see that you can set up to ten baselines. Accept the default to save the entire project. Click **OK**. Notice that the Baseline column changes to have a light blue background color.
3. *Display the Tracking table.* Click the **Task** tab, right-click the **Select All** button and then click **Tracking to view the tracking table**. Move your mouse over each tracking button in the Ribbon to see what it does. Your screen should resemble Figure A-51.

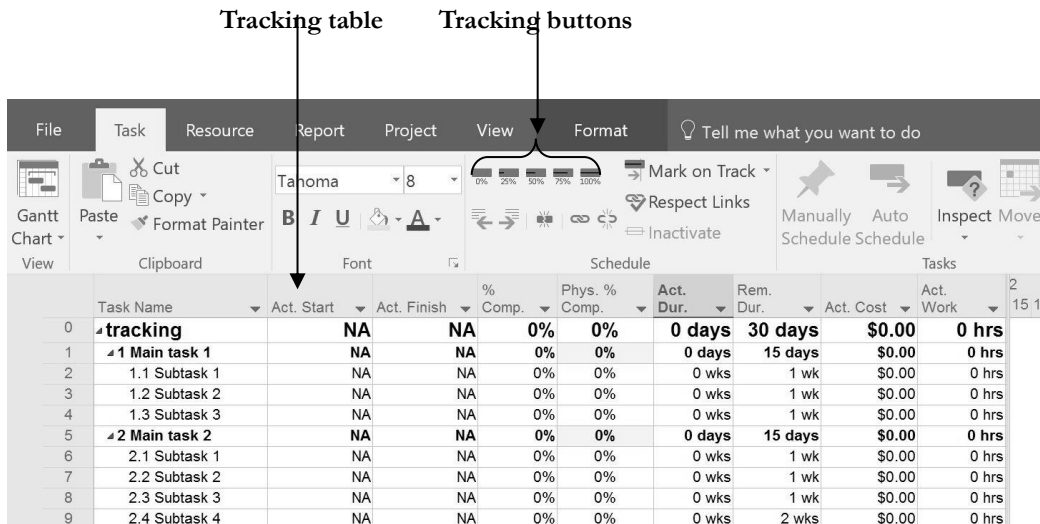


Figure A-51.

Using the tracking table and tracking buttons

4. *Mark Tasks 2 through 4 as 100% complete.* Click the Task Name for Task 2, **Subtask 1** under **Main task 1**, and drag down through Task 4 to highlight those tasks. Click the **100% Complete** button on the Ribbon. The columns with dates, durations, and cost information should now

contain data instead of the default values, such as NA or 0%. The % Comp. column should display 100%. Adjust column widths if needed. Your screen should resemble Figure A-52. Notice that the Gantt chart bars for those three tasks now have a black line through them.



Figure A-52.

### Tracking table information

5. Enter actual completion dates for Task 6. Click the Task Name for Task 6, Subtask 1 under Main task 2, click the Mark on Track drop-down, and then click Update Tasks. The Update Tasks dialog box opens. For Task 6, enter the Actual Start date as 1/28/13 (the same as the Current Start date) and the Actual Finish date as 2/11/13 (ten days later than the Current Finish date), as shown in Figure A-53. Click OK. Notice how the information in the tracking sheet has changed.

Figure A-53. Update Tasks dialog box

6. View the Tracking Gantt chart. Click the drop-down arrow on the far left of the screen where it says Gantt chart, and then click Tracking Gantt to quickly switch to that view. Move the split bar and adjust column widths as needed. Use the horizontal scroll bar in the Gantt chart window to the right (move the slider to the left) to see symbols on the Tracking Gantt chart. Use the Zoom slider on the lower right of the screen to adjust the timescale so you can see all of the symbols. Your screen should resemble Figure A-54. The blue bar for task 6 shows the actual time you just entered. Notice that the delay in this one task on the critical path has caused the planned completion date for the entire project to slip (now Feb 25 versus Feb 13). Also notice the Indicator column to the far left. The check marks show that tasks are completed.

### Completion indicator

### Tracking Gantt chart

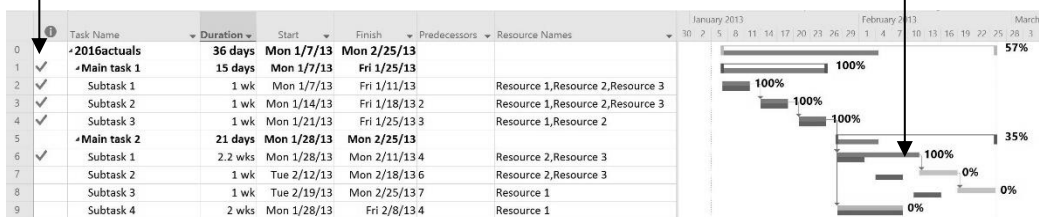


Figure A-54. Tracking Gantt chart view

7. Save your file as a new file named *2016actuals.mpp*. Click **File** on the Menu bar, and then click **Save As**. Name the file **2016actuals**, and then click **Save**.

Notice the additional information available on the Tracking Gantt chart. Completed tasks have 100% by their symbols on the Tracking Gantt chart. Tasks that have not started yet display 0%. Tasks in progress, such as Task 5, show the percentage of the work completed (35% in this example). The project summary task bar indicates that the entire project is 57% complete. Viewing the Tracking Gantt chart allows you to easily see your schedule progress against the baseline plan. After you have entered some actuals, you can review earned value information for the initiating tasks of this project. Of course you should continue this process of entering actuals on a real project until it is completed and include the final earned value data in a final project report.

## VIEWING EARNED VALUE MANAGEMENT DATA

Earned value management is an important project management technique for measuring project performance. Because you have entered actual information, you can now view earned value information in Project Professional 2016. You can also view an earned value report using the visual reports feature.

To view earned value information:

1. *View the Earned Value table.* Using the *2016actuals* file you just saved (or downloaded from the companion Website), click the **Select All** button, select **More Tables**, and double-click **Earned Value**. Move the split bar to the right to reveal all of the columns, as shown in Figure A-55. Note that the Earned Value table includes columns for each earned value acronym, such as PV, EV, AC, SV, CV, etc. Also note that the EAC (Estimate at Completion) is higher than the BAC (Budget at Completion) for Task 6, where the task took longer than planned to complete. Task 0 shows a VAC (Variance at Completion) of (\$3,360.00), meaning the project is projected to cost \$3,360 more than planned at completion. Remember that not all of the actual information has been entered yet. Also note that the date on your computer must be set later than the date of a completed task for the data to calculate properly.

*Select All button*

Task Name	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	AC (ACWP)	SV	CV	EAC	BAC	VAC
0 2016actuals	\$11,200.00	\$8,000.00	\$10,400.00	\$3,200.00	\$2,400.00	\$14,560.00	\$11,200.00	\$3,360.00
1 Main task 1	\$6,000.00	\$6,000.00	\$6,000.00	\$0.00	\$0.00	\$6,000.00	\$6,000.00	\$0.00
2 Subtask 1	\$2,400.00	\$2,400.00	\$2,400.00	\$0.00	\$0.00	\$2,400.00	\$2,400.00	\$0.00
3 Subtask 2	\$2,400.00	\$2,400.00	\$2,400.00	\$0.00	\$0.00	\$2,400.00	\$2,400.00	\$0.00
4 Subtask 3	\$1,200.00	\$1,200.00	\$1,200.00	\$0.00	\$0.00	\$1,200.00	\$1,200.00	\$0.00
5 Main task 2	\$5,200.00	\$2,000.00	\$4,400.00	(\$3,200.00)	(\$2,400.00)	\$11,440.08	\$5,200.00	(\$6,240.08)
6 Subtask 1	\$2,000.00	\$2,000.00	\$4,400.00	\$0.00	(\$2,400.00)	\$4,400.00	\$2,000.00	(\$2,400.00)
7 Subtask 2	\$2,000.00	\$0.00	\$0.00	(\$2,000.00)	\$0.00	\$2,000.00	\$2,000.00	\$0.00
8 Subtask 3	\$400.00	\$0.00	\$0.00	(\$400.00)	\$0.00	\$400.00	\$400.00	\$0.00
9 Subtask 4	\$800.00	\$0.00	\$0.00	(\$800.00)	\$0.00	\$800.00	\$800.00	\$0.00

**Figure A-55. Earned value table**

2. *View the earned value chart.* Click the **Report** tab, and then click **Costs** under the View Reports group, and then click **Earned Value Report**, as shown in Figure A-56. You can experiment with different report options or click the link to Learn more about earned value, as desired.

## EARNED VALUE

Earned value management helps you quantify the performance of a project. It compares costs and schedules to a baseline to determine if the project is on track.

If the charts don't look right, make sure you have set a baseline, assigned costs to tasks or resources, and entered progress.

Rectangular Snip

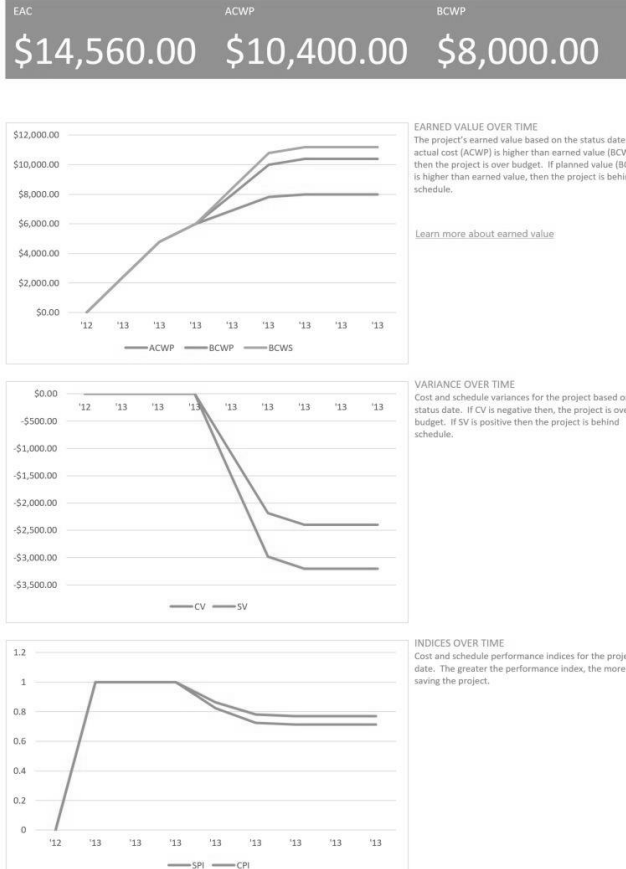


Figure A-56. Earned value report

3. *Close without saving the file.* Click the **File** tab, click **Close**, and select **No** when prompted to save the file. You can also exit Project Professional 2016 and take a break, if desired.

Next you will use a few more features to help tie your project to other applications.

## INTEGRATING PROJECT PROFESSIONAL 2016 WITH OTHER APPLICATIONS AND APPS FOR OFFICE

Project Professional 2016 provides several features to make it easy to integrate with other applications. For example, you can copy data between Project Professional 2016 and other applications (including the timeline), or you might want to create hyperlinks to project documents created in Word, Excel, PowerPoint, or other applications from within your project files. You can also purchase and add new apps to Project 2016 from Microsoft's Office Store.

### *Copying Information between Applications*

Most people are familiar with copying information between Office applications. For example, you can highlight a column of data in Excel, select copy, and then select Paste in Project Professional 2016 or other applications. You can also create a new Project Professional 2016 file from an existing Excel file by select New from Excel Workbook. It is also easy to copy a timeline into another application.



To copy a timeline:

1. *Open another Project Professional 2016 template file.* Start Project Professional 2016, and open a template file, such as **Residential Construction**, as shown in Figure A-57. Notice the timeline near the top of the screen.

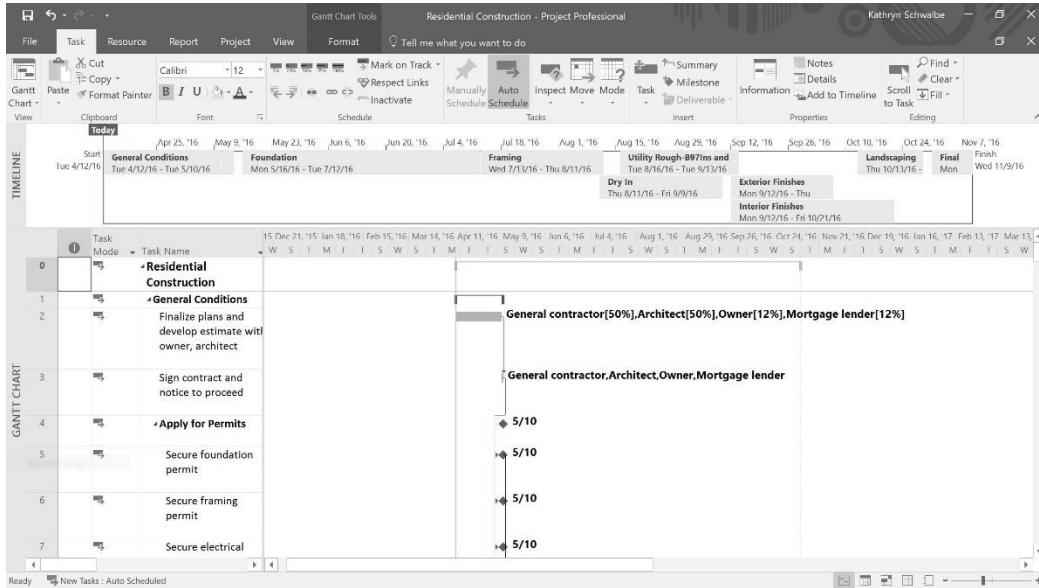


Figure A-57. Residential construction template

2. *Copy the Timeline.* Click anywhere on the Timeline, and then click the **Copy Timeline** button in the Copy group on the Ribbon, as shown in Figure A-57, and select **For Presentation**.

3. *Paste the Timeline into PowerPoint.* Open **PowerPoint**, change the slide layout to Title and Contents, type “**Project Timeline**” as the title for the slide, and change the theme, as desired (Main Event is selected here), and then **right-click** in the contents section and select **Paste picture**. Your screen should resemble Figure A-58, showing the Project Professional 2016 Timeline in your presentation. You can also paste the timeline into other presentation software, as desired.

4. *Close the file without saving it.* Click the **File** tab, click **Close**, and select **No** when prompted to save the file.

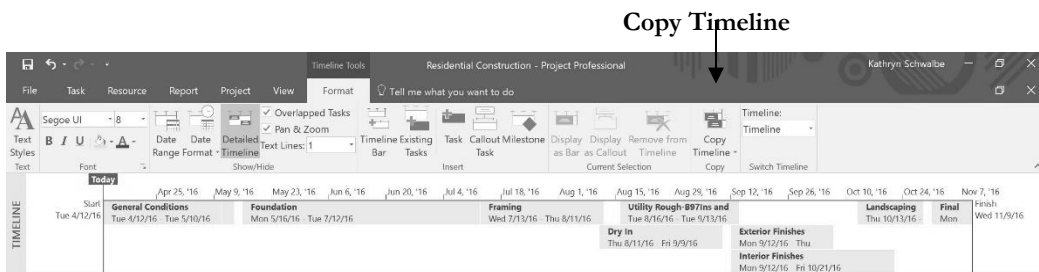


Figure A-58. Copy Timeline



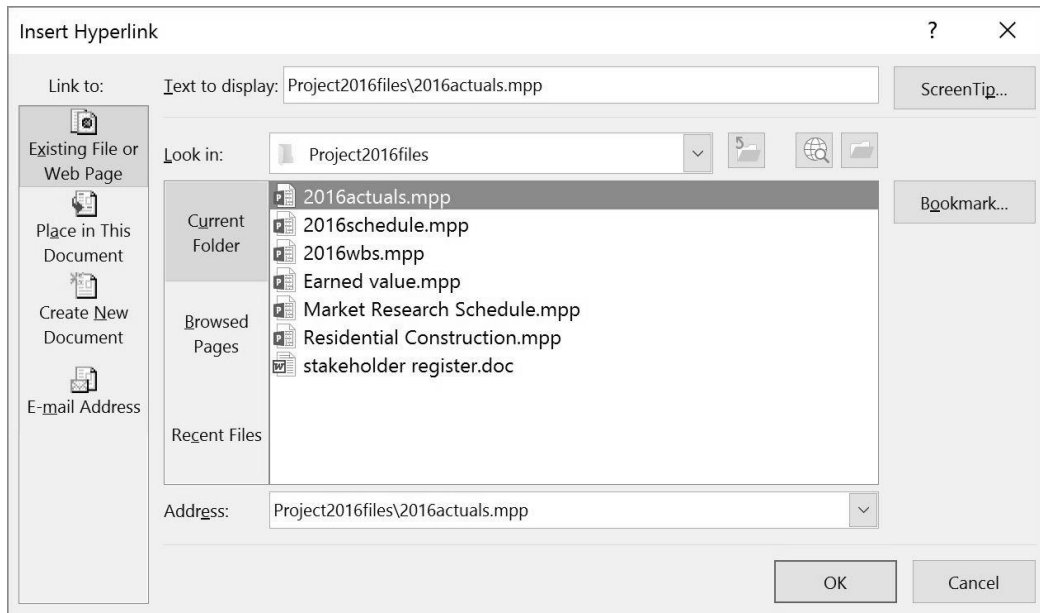
Figure A-59. Timeline picture pasted into PowerPoint

### *Creating Hyperlinks to Other Files*

Some people like to use their Project Professional 2016 file as a main source of information for many different project documents. To do this, you can simply insert a hyperlink to other document files. For example, you can create a hyperlink to the file with the stakeholder register you listed as a milestone in your Task Name column earlier.

To insert a hyperlink within a file:

1. *Open the **2016schedule.mpp** file.* Use the file you saved earlier or download it from the companion Website for this text. The Entry table and Gantt Chart view should display.
2. *Select the task in which you want to insert a hyperlink.* Click the Task Name for **Task 3, Stakeholder register completed.**
3. *Open the Insert Hyperlink dialog box.* Right-click in that cell, then click **Hyperlink**. The Insert Hyperlink dialog box opens, as shown in Figure A-60. You will have different folders visible based on your computer's directory structure.



**Figure A-60. Insert hyperlink dialog box**

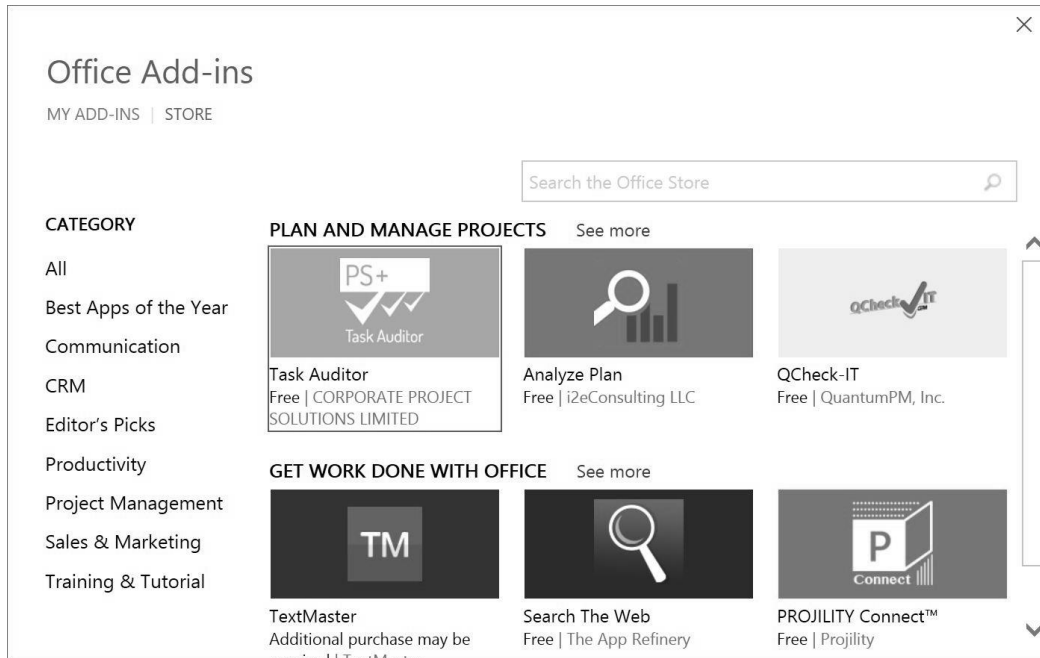
4. *Double-click the filename of the hyperlink file.* Change the **Look in:** information until you find where you have saved the files you downloaded for this appendix. Double-click the Word file named **stakeholder register**, and then click **OK**. A Hyperlink button appears in the Indicators column to the left of the Task Name for Task 3. (Note: If that column does not display, click the **Format** tab, **Insert Column**, and select **Indicators**). Move your mouse over the hyperlink button until the mouse pointer changes to the Hand symbol to reveal the name of the hyperlinked file. If you click on it, the file will open.

### ***Using Project Professional 2016 Apps***

Microsoft has an Office Store where you can download special apps for Project Professional 2016. New apps are added often.

To explore Project Professional 2016 apps:

1. *Access the Office Store.* With Project Professional 2016 open, click the **Project** tab, then click **Store button** on the left of the Ribbon under the Add-ins group. The Office Add-ins dialog box opens, as shown in Figure A-61.



**Figure A-61. Apps for Office dialog box (as of April 2016)**

2. *Explore the Add-ins.* Read information about various apps, as desired.
3. *Close Project Professional 2016.* Click the **Close icon** in the upper right of the window to close the application. Select **No** when prompted to save the file.

### ***Synching with Project Server and Project Online***

Recall from Figure A-1 that Project Professional 2016 is one of six different versions of Project 2016. One of its features is that it can be synched with Project Server and Project Online to allow collaboration with team members, PMO staff, and senior executives. Remember that individual projects are often part of programs and portfolios created to support organizational strategy.

You have really just touched the surface of Project Professional 2016's powerful features, but you probably know more than most people who have this software! Consult other books, online resources, and experts for more detailed information to learn even more about Project Professional 2016 and other versions of Project 2016.

## DISCUSSION QUESTIONS

1. What are the six different versions of project management software offered by Microsoft? Briefly describe how they differ and who uses them.
2. What are some unique features of project management software in general?
3. What are the new features of Project Professional 2016?
4. How do you create a WBS in Project 2016?
5. How do you enter task durations and establish dependencies between tasks?
6. How do you establish a baseline in Project 2016 and enter actual information?
7. What type of information do you see in the Earned Value table?
8. What are some of the reports built-in to Project 2016? Which ones do you think are commonly used?
9. How can you access other application files from within Project 2016?

## EXERCISES

1. To make sure you understand the information in this appendix, perform the steps yourself. Print out the following screen shots or send them to your instructor, as directed. Remember that you can download required files from [www.intropm.com](http://www.intropm.com).
  - a. Figure A-11. Network diagram view
  - b. Figure A-16. Resource Overview report
  - c. Figure A-23. Adding automatic outline numbers and a project summary task
  - d. Create a new Project Professional 2016 file called general-wbs. Make the main categories survey phase, design phase, and implementation phase. Include at least two deliverables with at least two activities and one milestone under each of the phases. Use meaningful, fictitious names for them. For example, you might have a deliverable under survey phase called survey with activities called create survey and administer survey and a deliverable called survey completed. Enter 0 for the duration of the milestones, but do not enter any durations for the other tasks. Be sure to indent tasks and show the outline numbers before printing or submitting the file.

2. Continue performing the steps in this appendix, starting with the section called Developing the Schedule. Print out the following screens or send them to your instructor, as directed:
  - a. Figure A-32. All task durations and recurring task entered
  - b. Figure A-39. Network diagram view
  - c. Figure A-46. Changing Work hours for tasks
  - d. Figure A-56. Earned value report
  - e. Continue performing the steps, or at least read them. Write a one-to-two page paper describing the capabilities of Project Professional 2016 and your opinion of this software. What do you like and dislike about it?
3. If you are doing a team project as part of your class or for a project at work, use Project Professional 2016 to create a detailed file describing the work you plan to do for the project.
  - a. Create a detailed WBS, including several deliverables, activities, and milestones. Also estimate task durations, link tasks, add tasks to the timeline, and enter resources and costs, assign resources, and so on. Save your file as a baseline and print it out or send it to your instructor, as directed.
  - b. Track your progress on your team project by entering actual cost and schedule information. Create a new baseline file if there have been a lot of changes. View earned value information when you are halfway through the project or course. Continue tracking your progress until the project or course is finished. Print or submit your Gantt chart, Project Summary report, Earned Value table, and relevant information to your instructor.
  - c. Write a two- to three-page report describing your experience. What did you learn about Project Professional 2016 from this exercise? How do you think the software helps in managing a project? You may also want to interview people who use project management software for their experiences and suggestions.

## END NOTES

<sup>1</sup>Marketsandmarkets.com, “Project Portfolio Management (PPM) Market by Platform Type (Software and Services), Deployment Type (On-Premises and Cloud), End User, Business Solutions, Industry Vertical, and Region - Global Forecast and Analysis to 2020,” February 2016). Note: USD means U.S. dollars.