# MICROSOFT PROJECT 2013 TUTORIAL

Introduction

Microsoft Project is a Windows-based project management software package. It provides the flexibility to help manage your projects, provides assistance in every phase of the project and calculates schedules and other project information. It helps to build the project plan and also helps in tracking it to its completion. Microsoft Project supports calendar controls, allocation of resources, production of network charts, Gantt charts, resource charts, calendar charts and dozens of reports. It is easy to navigate and similar to other Microsoft packages. Microsoft Project can be of substantial assistance in the management of projects. It does not produce or print a delineated work breakdown structure, although it does generate work breakdown structure numbers. Its primary advantage is its widespread use and the availability of hundreds of add-ins.

Installing Microsoft Project

Microsoft Project is available to download via Microsoft DreamSpark. When installed, it usually positions itself in the Microsoft Office folder.

Getting Started

1. Click the **Start** button in the lower-right-hand corner of your windows taskbar, then point to **All Programs**, then **Microsoft Office 2013** and finally click **Project 2013**.
2. To create a new project file, select **Blank Project**. The new project screen exhibits below:
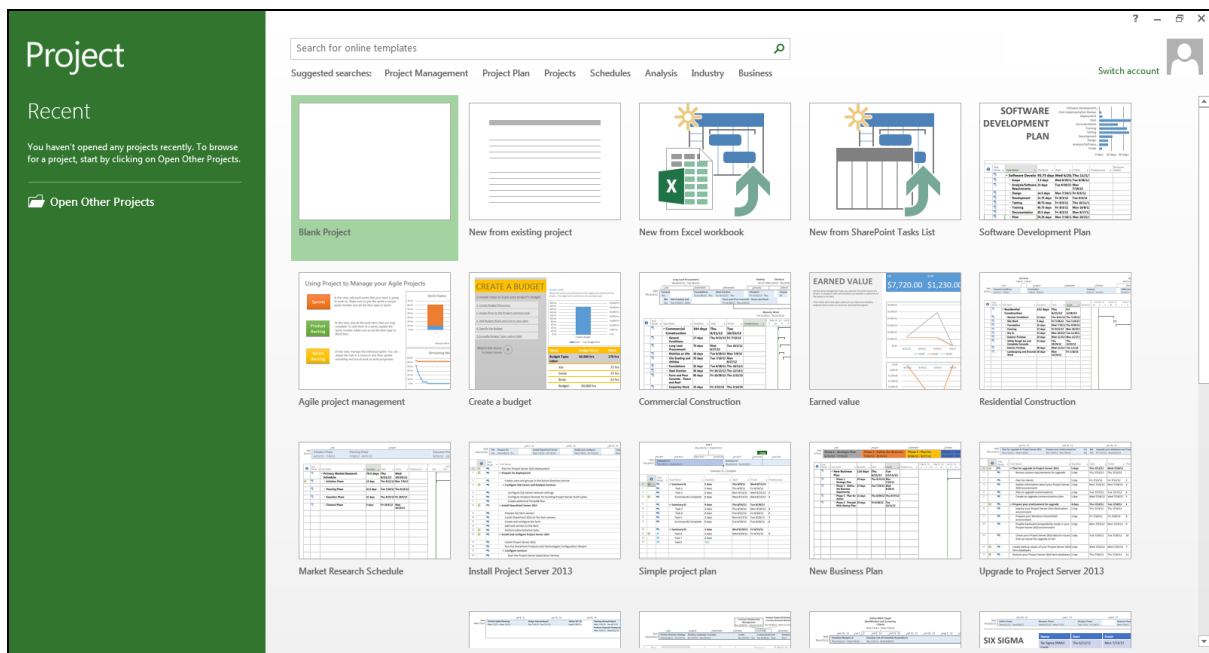
3. A new blank project schedule appears as displayed below. In the status bar at the bottom of the screen, click **New Task: Manually Scheduled**, then click **Auto Scheduled** option from the pop-up menu that appears.
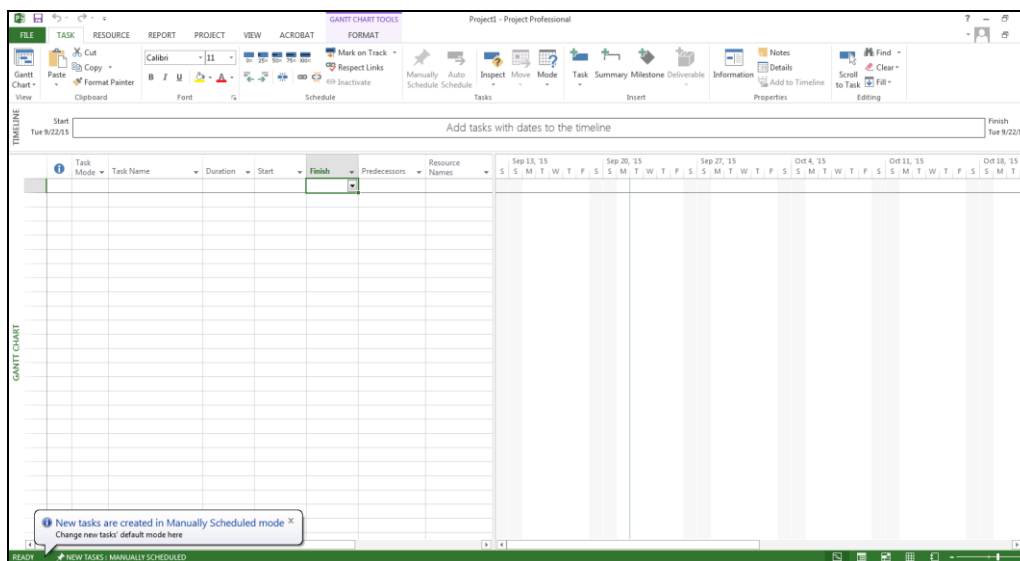
4. To specify a start date, click the **Project** tab, then click the **Project Information** button. The *Project Information* dialog box appears, as exhibited below. In the *Project Information* window, enter the project start date; otherwise, by default today's date is taken. You can schedule a project from either its start date or its finish date, but not both. The *Schedule from:* box is where you can specify whether you want the project scheduled from the start date or from the completion date. In the former case, tasks begin as soon as possible. In the latter case, tasks begin as late as possible. Click on the drop-down arrow associated with the *Schedule from:* box and select the second of the two alternatives and then select the first again. Note how the comment underneath changes. Now, click **OK** at the bottom of the pane.

You are placed in the Gantt view of the project. This is really a combination of two views in one. On the left, you have a table that you can change. On the right, you have the typical Gantt chart. You can move the partition between two simply by attaching the cursor to the partition edge and dragging it to the left or to the right. Dragging it to the right reveals more of the table, but lessens the amount of the Gantt chart that is in view. Dragging it to the left does just the opposite.
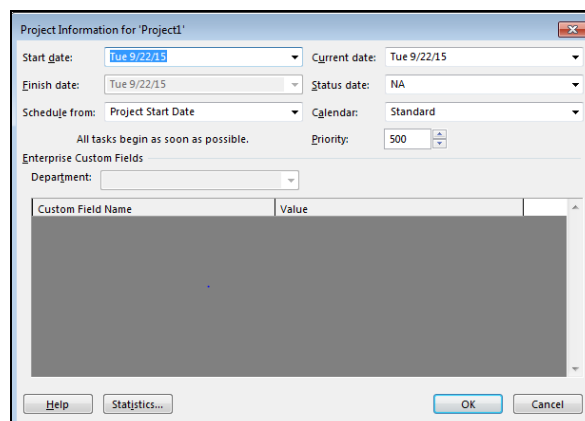
5. Click the **File** tab, then click the **Save As** button and give the project a name.

Entering Tasks

1. Click the **View** tab, then click the **Gantt Chart** button, and select **Gantt Chart** from a drop-down list. In most cases, this was the view you were placed in to begin with so nothing changes.
2. In the **Task Name** column, type in several task names, one to a line. Use the down arrow to move to the line below or press **Enter** after typing a task name.
3. In order to insert a task in the list, between two tasks, position the cursor on the task above the point in which the insertion is to be made, right click and select **Insert Task**. Microsoft Project will insert a task row that you can enter the task name.

Specify Subordination

This is basically grouping tasks into phase, which makes it easier to track a project and also makes it easier to read the task list. Grouping is done by *indenting* tasks. A task can also be removed from a group and that is called *out-denting*. Tasks that are subordinate to a higher level task on the work breakdown structure are so indicated by subordination.

1. In the **Task Name** column, select the task you want to indent or out-dent by *boxing* it as you would in any spreadsheet. Boxing is done by simply clicking on the cell in which the task resides.
2. On the **Task** tab, in the **Schedule** group, click the **Indent Task** button to indent the task or **Out-dent Task** button to out-dent the task. You can also highlight a number of tasks and then click on the **Indent Task** or **Out-dent Task** button to indent or out-dent the entire collection of tasks at once.

Note: Microsoft Project assigns numbers to the task to indicate the level of the task. These are called *outline numbers*. If you indent three tasks under a particular task say task no. 1 then the three tasks are numbered as 1.1, 1.2 and1.3. To display the outline numbers in the **Task Name** column, click the **Format** tab, in the **Show/Hide** group, check **Outline Number** box. Alternatively, you can show the outline numbers as WBS codes in the **WBS** column. To display the **WBS** column, select the **Task Name** column, then right click and select **Insert Column** from the list. The new column is inserted to the left of the **Task Name** column. From the list in the new column, scroll down and select **WBS**. The default of the outline numbers is shown in the **WBS** column. The outline numbers can be customized as needed by selecting the **Project** tab and clicking on **WBS** button in the **Properties** group. Under **WBS**, select **Define Code** to customize the outline numbers for your project.

Specify Task Durations

Microsoft Project sets default duration of one day for each task that you entered or inserted above. You will obviously have to change many of these. You can do so by entering the duration in the **Duration** column. After you enter the duration, you may press the **Down Arrow** key or hit **Enter**.

Note: A *milestone* is a task whose duration is zero days. Any task can be changed to a milestone by changing duration to zero.

You will not need to enter the durations of tasks which have subtasks subordinated below them. These tasks have their durations calculated as the sum of all the demoted task durations. Think of tasks that have subtasks as a summary of all the subtask information that is subordinate to them. Consider the following list of tasks:

No.	WBS	Name	Duration (d)	Predecessors
1	1	Analysis	27	
2	1.1	Interviews	7	
3	1.1.1	Management	1	1
4	1.1.2	Supervisor	2	3
5	1.1.3	Technical	2	4
6	1.1.4	Clerical	2	5
7	1.2	Anal Existing Doc	3	2
8	1.3	Synthesis	3	7
9	1.4	Functional Spec	5	6,8
10	1.5	Re-estimate	1	9
11	1.6	Development Prop	4	10
12	1.7	Presentation	4	11

Note that, in the list above, Analysis duration is exactly as long as necessary to accommodate all of its subtasks and sub-subtasks. Microsoft Project will figure this out automatically. Thus, once all the subtask and sub-subtask durations are entered, Microsoft Project will compute the duration automatically of the associated task. It is not possible for the user to change this. The same can be said for subtasks when they have sub-subtasks. Again, Microsoft Project will not allow you to change the duration of a task that has subtasks.

Microsoft Project accepts durations in minutes, hours, days, weeks or months. When entering data into the **Duration** column, use the following designations for minutes (m), hours (h), days (d), weeks (wk), or months (mo). The default is days (d) and therefore, the "d" is optional and need not be entered when the intent is to enter durations in days. Thus, if the scheduled duration of a task is 6 days, simply press 6 and then hit **Enter**.

Microsoft Project has its own built-in understanding of time and it is making a lot assumptions about the way in which you work. For example, it is assuming 8-hour work days, five-day work weeks and that you do not work on Saturday or Sunday. To see this, view the project in the Calendar view by clicking the **View** tab then clicking the **Calendar** button in the **Task Views** group; notice the duration of the tasks and how they fall across weekends as necessary to fill up the required number of weekdays. You can change the default working time (8-hour work days, five day work weeks) by selecting the **Project** tab and clicking on the **Change Working Time** button.

Inserting Columns

You can insert columns within any table in the Gantt view. Make certain that your first task is a summary task under which all other tasks are subordinated. Include a *Cost* column in the entry table next to the *Duration* column. You can also include "major function," "output," and "input" columns within the entry table. To insert a new column, select one column where you want your new column to locate (to the left of the selected column) then right click and select **Insert Column**. A new column is inserted to the left of the selected column along with a list of columns you may choose to insert.

Showing Task Precedence

This is done to show the time-sequential relationship between two tasks. To show that a particular task can begin only when the predecessor task has completed, the two tasks must be linked. After you decide the task sequence, you can link the tasks, as follows.

1. In the **Task Name** column, select two or more tasks that you want to link. To select more than one task, use the **Ctrl** button in conjunction with the left-click button on the mouse for every task selected after the first. To avoid confusion, it is best to select only a pair of tasks at a time. The first task you click on will be assumed to be the precedent task and the second task that you click on will be assumed to be the subsequent task.
2. On the **Task** tab, in the **Schedule** group, click the **Link Tasks** 🔗 button.

Microsoft Project generally links tasks as Finish-to-Start tasks, i.e., the second task begins only when the preceding task has completed. Several precedent tasks can be linked into single subsequent task, but this has to be done in pairs in which each precedent task is clicked on first, followed by a click on the subsequent task.

To link the task in Start-to-Start, Finish-to-Finish or Start-to-Finish dependency, the following steps should be followed.

1. In the **Task Name** column, double click the task you want to link. The *Task Information* dialog box appears.
2. Click the **Predecessors** tab.
3. In the **ID** column, type the ID number of the predecessor task (this is the number on the far left column). The **Type** box should show the default Finish-to-Start (FS) relationship.
4. Click in the **Type** box and then click the drop-down arrow to see the four types of dependency relationships that can be established. As indicated, the default link type is a Finish-to-Start link, that is, a link in which the succeeding task is not allowed to start until the preceding task is complete. However, Start-to-Start links and Finish-to-Finish links are also possible. In these latter cases, the analyst wants tasks to start together or finish together.

To unlink tasks, use the **Unlink Tasks** 🔗 button on the **Task** tab in the **Schedule** group after highlighting the associated task names.

Setting Hard Start Dates, Stop Dates

It is possible to set hard start dates, stop dates for tasks in Microsoft Project. To do so, begin in the Gantt view with the entry table visible. Slide the partition to the right to expose as much of the entry table as possible. You should see two side-by-side columns—the start column and the finish column. By changing any of the dates in these columns, you are setting a hard date constraint. If you do so, an indicator will appear in the first column of the entry table, the column labeled 🛈 for information. If you rest the cursor on that indicator, a message appears that informs you of the hard date constraint that has been applied to the task. Only one hard date constraint can be set per task—at the start date or at the stop date, but not both.

Assigning Resources

An assignment is the pairing of a resource to a task. A resource is a person and/or equipment item needed to accomplish the task. Resources can be places, departments, businesses, people, equipment—anything required to complete an activity. When you create an assignment, you assign a resource to a task. The resource issue makes the project management picture far more robust. Microsoft Project can accommodate situations where the assigned resource is not available at the time the task is to start, or is available for a few hours each day. Microsoft Project assigns costs to tasks on the basis of the resource hours consumed by those tasks.

You can:
- assign individual resources
- assign resources part time
- assign several resources
- remove resources from a task
- replace one resource with another.

Assigning Resources to Tasks

1. In the **Task Name** column, select the task to which you have to assign a resource.
2. On the **Resource** tab, in the **Assignments** group, click the **Assign Resources** button.
3. The *Assign Resources* dialog box appears. In the **Resource Name** column, type in the name of the resource and click on **Assign**.

Note: By default Microsoft Project assigns 100 of the resource to the task. To change this, assign it, say part time, type a percentage less than 100% in the **Units** column.

Assigning Several Resources

Several resources can be assigned to a single task. In older versions of Microsoft Project, when such is done, Microsoft Project will cut the duration of the task in half, assuming that each resource is working 100% on the task and that the two together are twice as fast as either would be alone. This is a bad

assumption in the software business because as Brooks (1975) points out in his book *The Mythical Man-Month* that men and months are not interchangeable unless there is no interaction between them. If you decide to split your job with another person, you will have to spend some time training the other person to do your part of the job. Then you will have to interact with the other person as the two of you together build the interfaces that are necessary between each person's module(s). Clearly, the time is not split in half. Therefore, in the previous versions of Microsoft Project, you have to re-set the duration to the original plan. However, this assumption has been removed from Microsoft Project 2013 version so you do not have to go back and check the duration for each task.

Removing Resources from a Task

1. In the **Task Name** column, select the task to which you have to remove a resource.
2. On the **Resource** tab, in the **Assignments** group, click the **Assign Resources** button.
3. The *Assign Resources* dialog box appears. In the **Resource Name** column, select the resource you want to remove, then click **Remove**.

Assigning and Managing Costs

Estimating costs and assigning them to tasks and resources helps you to develop a project budget. It also helps you to determine how closely the final project cost matches its estimated cost and helps in planning for the future.

Assigning a Rate to a Resource

Microsoft Project helps us to assign hourly or fixed rates to resources. For hourly rates, you can assign a standard rate (**Std. Rate**), which is the rate you pay a resource during normal working hours. Overtime rate (**Ovt. Rate**) is the amount you will pay the resource for any overtime that it does. To resources that charge a flat amount to do a job, you can assign a fixed cost per use (**Cost/Use**).

1. On the **Resource** tab, click on the **Team Planner** button, then select **Resource Sheet** from the drop-down list.
2. In the **Std. Rate**, **Ovt. Rate** and **Cost/Use** columns for the resource, type the rates that apply and press **Enter**.

Assigning a Fixed Cost to a Task

1. On the **View** tab, click the **Gantt Chart** button in the **Task Views** group.
2. On the **View** tab, click the **Tables** button in the **Data** group, and select **Cost** from the list.
3. In the **Fixed Cost** column for the task, type in the cost and press **Enter**.

Viewing Costs

Microsoft Project provides numerous ways to examine costs associated with a project. You can:
- view the cost per task
- view the cost per resource
- view the total project cost.

Viewing the Cost per Task

The sum of individual task costs make up most if not all of the total project cost. To view the total cost of each task:

1. On the **View** tab, click the **Gantt Chart** button in the **Task Views** group.
2. On the **View** tab, click the **Tables** button in the **Data** group, and select **Cost** from the list.
3. Scroll the table on the left to view the **Total Cost** column.

Viewing the Cost per Resource

This helps you to know the total cost of that resource for all the tasks the resource is assigned to.

1. On the **Resource** tab, click on the **Team Planner** button, then select **Resource Sheet** from the drop-down list.
2. On the **View** tab, click the **Tables** button in the **Data** group, and select **Cost** from the list.

Viewing the Total Project Cost

1. On the **Project** tab, click the **Project Information** button in the **Properties** group.
2. Click **Statistics**.

Determining Critical Tasks

In every project there are tasks that can delay a project if they are not completed on time and tasks that can be completed after their original finish time without affecting the project finish date. Tasks that can delay a project are called *critical tasks* and the ones that do not delay are called *non-critical tasks*.

Critical tasks make up a special path known as the *critical path*. The critical path is the sequence of tasks that ends on the latest finish date, i.e., the finish date of the last task in the critical path is the project finish date. The critical path is the longest path through the network and the path that determines the duration of the total project. When you shorten the schedule, the critical path has to be shortened.

There are several ways to get Microsoft Project to exhibit the critical path in red. For one, you can right click anywhere in the Gantt chart, select **Show/Hide Bar Styles**, and click **Critical Tasks** from the list of options that it gives you. Another

way is to change the view by selecting the **Gantt Chart** button on the **View** tab and selecting **More Views** from a drop-down list. When the *More Views* dialog box appears, select **Detail Gantt** and click **Apply**.

Finding Slack in the Schedule

Free slack is the amount of time a task can be delayed without delaying the finish date of another task.

1. On the **View** tab, select the **Gantt Chart** button in the **Task Views** group, then select **More Views** from a drop-down list.
2. When the *More Views* dialog box appears, select **Detail Gantt** and click **Apply**. Slack on a task appears graphically as thin slack bars adjoining the regular Gantt bars.
3. You can also view the **Free Slack** and **Total Slack** from the schedule table. To view the schedule table, on the **View** tab, click the **Table** button in the **Data** group, and select **More Tables** from the drop-down list provided. When the *More Tables* dialog box appears, select **Schedule**, and then click **Apply**.

Shortening Your Schedule

The most effective way to shorten your schedule is to adjust tasks that lie on the critical path. Adjusting non-critical tasks will not shorten the schedule. The actions you can take to shorten your schedule fall into two categories.

- **Shorten Task Duration.** This can be done by decreasing the duration directly, by decreasing total work, by assigning more resources to a task, by assigning overtime work and by increasing a resource's work schedule.
- **Compress the Schedule.** This can be done by making the tasks start sooner, by combining or deleting tasks, by breaking down a task into non-critical subtasks, by adding lead time to a task, by changing the task dependency, type of task. etc.

Do the followings to break down a critical task into non-critical subtasks:

1. On the **View** tab, select the **Gantt Chart** button in the **Task Views** group, then select **More Views** from a drop-down list.
2. When the *More Views* dialog box appears, select **Detail Gantt** and click **Apply**.
3. In the **Task Name** column, select a single task on the critical path that could be completed in several steps.
4. On the **Task** tab, click the **Unlink Tasks** button in the **Schedule** group.
5. Remove the resources assigned to the task.
6. Select the task beneath the task you want to change, and then right click and select **Insert Task**.
7. Repeat step 6 for each subtask you want to add.
8. For each new task, type a name in the **Task Name** column and duration in the **Duration** column.
9. In the **Task Name** column, select all the new tasks, and then click the **Indent Task** button to make them subtasks of the original task. The original task becomes the summary task. One subtask will be on the critical path.

10. Click the **Link Tasks** button.

The Network or PERT Chart View

To view the Network or PERT chart, click the **View** tab, then select the **Network Diagram** button in the **Task Views** group. The Network diagram of the above exercise is displayed below. You can adjust the display size of the diagram by left clicking anywhere in the network diagram and selecting **Zoom**, then adjusting the percentage as appropriate.
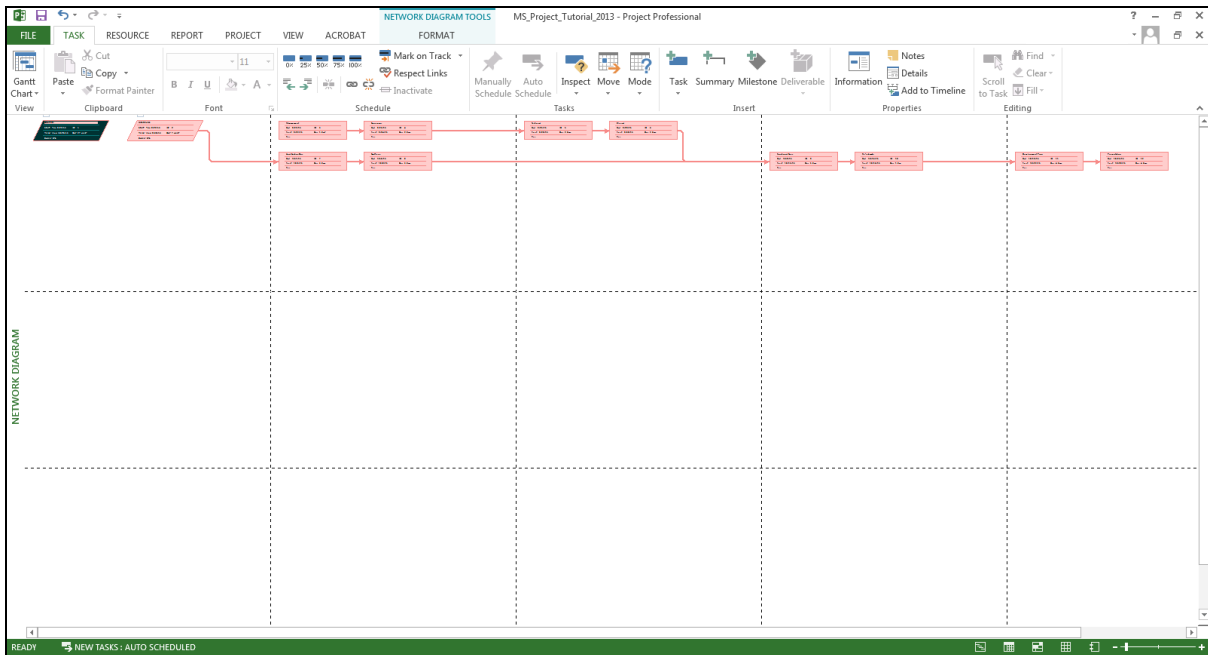
Printing the Required View

Microsoft Project provides many views of the project that can be printed out. As a minimum, they are the Gantt view, the Task Usage view, the Tracking Gantt view, the Network Diagram view and the Calendar view. To print the required view, select the view from the **View** tab, then on the **File** tab, select **Print**. Adjust your printer properties as appropriate.

Analyzing a Project

The main goals of analyzing your project plan are to:
- shorten the schedule to meet project deadline.
- distribute the work load evenly by resolving resource over allocations so that no resources are overworked
- reduce costs to a minimum to save money and complete the project within your budget.

The most important part of the plan is the schedule. By adjusting the schedule, you can schedule a task to start and finish sooner, bring in the project finish date, shrink task durations and distribute the workload more evenly. Before you analyze and adjust a task's schedule, you need to know what factors affect its schedule. The

main factors that affect how Microsoft Project determines a task's start and finish dates are:

- **Placement.** In a logically ordered set of tasks, the tasks are usually performed in the order in which they appear in the task list. For example, a task near the top of the list occurs at the beginning of the project; a task in the middle of the list occurs in the middle of the project.
- **Duration.** Several factors affect duration, but, in general, the longer the duration you enter, the later a task finishes. Changing the duration may change the task finish date.
- **Task Dependencies.** The type of link you establish between two tasks determines whether the successor task starts after the predecessor task is complete. By replacing one type of link with another, you can change the task's start and finish dates and, perhaps the project end date.
- **Overlap and Delay.** The overlap or lead-time you add between two tasks causes the successor task to begin earlier. The delay or lag time between two tasks causes the successor task to begin later.
- **Constraints.** You can force a task to start or finish on or near a date you specify by entering a start or finish date yourself or you can change the default constraint from as soon as possible to an inflexible constraint such as Must start on or Finish no later than. It is, however, better to let Microsoft Project calculate and if the schedule changes, recalculate.
- **Assigned More Resources.** When you assign additional resources to a task, the task duration can change. Generally, the more resources you assign to a task, the shorter its duration becomes.
- **Work.** By changing the amount of work required to accomplish a task, you can change the task duration and thus the final date.
- **Task Type.** By default each task is a fixed unit task. You can change the task type to fixed duration or fixed work.

Other factors that affect how a task is scheduled are the project start date, the day of the week on which it starts and whether you split a task into portions, with an interruption between each portion.

Exercise 1

In this exercise you are going to enter the following tasks along with each task's duration (in days) and the predecessor tasks into Microsoft Project.

| No.	WBS	Name	Duration	Predecessors
1	1	IT PROJECT		
2	1.1	Definition		
3	1.1.1	Interviews	2d	-
4	1.1.2	Prep Req Doc	2d	3
5	1.1.3	Prep Proj Plan	2d	4
6	1.1.4	Prep Proposal	2d	5
7	1.2	Analysis		
8	1.2.1	Interviews		
9	1.2.1.1	Management	1d	6
10	1.2.1.2	Supervisor	2d	6
11	1.2.1.3	Technical	2d	6
12	1.2.1.4	Clerical	2d	6
13	1.2.2	Anal Existing Doc	3d	8
14	1.2.3	Synthesis	3d	13
15	1.2.4	Functional Spec	5d	14
16	1.2.5	Re-estimate Plan	1d	15
17	1.2.6	Development Prop	4d	16
18	1.2.7	Presentation	1d	17
19	1.3	Design		
20	1.3.1	System Design	5d	18
21	1.3.2	Walk-through	1d	20
22	1.3.3	File Design	2d	21
23	1.3.4	Walk-through	1d	22
24	1.3.5	Acc Test Plan	4d	23
25	1.3.6	Design Spec	5d	23
26	1.4	Construction		
27	1.4.1	Plan the Integration	4d	25
28	1.4.2	Module Design	5d	27
29	1.4.3	Walk-through	1d	28
30	1.4.4	Plan Module Testing	2d	29
31	1.4.5	Coding	5d	30
32	1.4.6	Module Test	5d	31
33	1.4.7	User Documentation	5d	25
34	1.5	System Test	5d	32

You will only be entering the data in the **Task Name**, **Duration** and **Predecessors** columns. The numbers to the left will appear automatically if you add the WBS column. Be sure to add the **WBS** and **Cost** columns to the entry table that is shown in the Gantt chart view. The numbers shown in the WBS column above are there to indicate subordination. However, Microsoft Project will do the work breakdown structure numbers you see above if you do the subordination (indentation) correctly. Interviews, Anal Existing Doc, Synthesis, Functional Spec, Re-estimate Plan, Development Prop and Presentation are all subtasks within Analysis. This is precisely what the 1.2.x is intended to designate. Likewise, 1.2.1.1

Management, 1.2.1.2 Supervisor, 1.2.1.3 Technical, and 1.2.1.4 Clerical are all sub-subtasks of subtask 1.2.1 Interviews. It will be necessary for you to *demote* these subtasks and sub-subtasks appropriately in Microsoft Project by use of the demotion (Indent) arrow in the Gantt chart view. Assign the following resources to the tasks:

Resource Name	Task	Hourly Rate
Kirk Kennedy	3, 4, 9, 13, 21, 23, 29	$50
Norbert Norris	5, 6, 10, 13, 14, 16, 21, 23, 29	$60
Floyd Ford	11, 17, 18, 21, 23, 29	$70
Frida Fisher	12, 20, 21, 22, 23, 24, 25, 29	$80
Judy Johnson	15, 21, 23, 27, 28, 29, 30, 31	$40
Ben Brown	21, 23, 29, 32, 33, 34	$50

Determine the total time and total budget required to complete this project. Printout the entry table with the WBS and Cost columns added and its associated Gantt chart. Explain why (in writing) it makes sense to include a Project task at the very beginning of your list of tasks. Explain why summary tasks have no stated duration in the table above. Explain why the first subordinated task immediately below a summary task has no predecessor.

The end result of all of these tasks and assignment entries is the following:
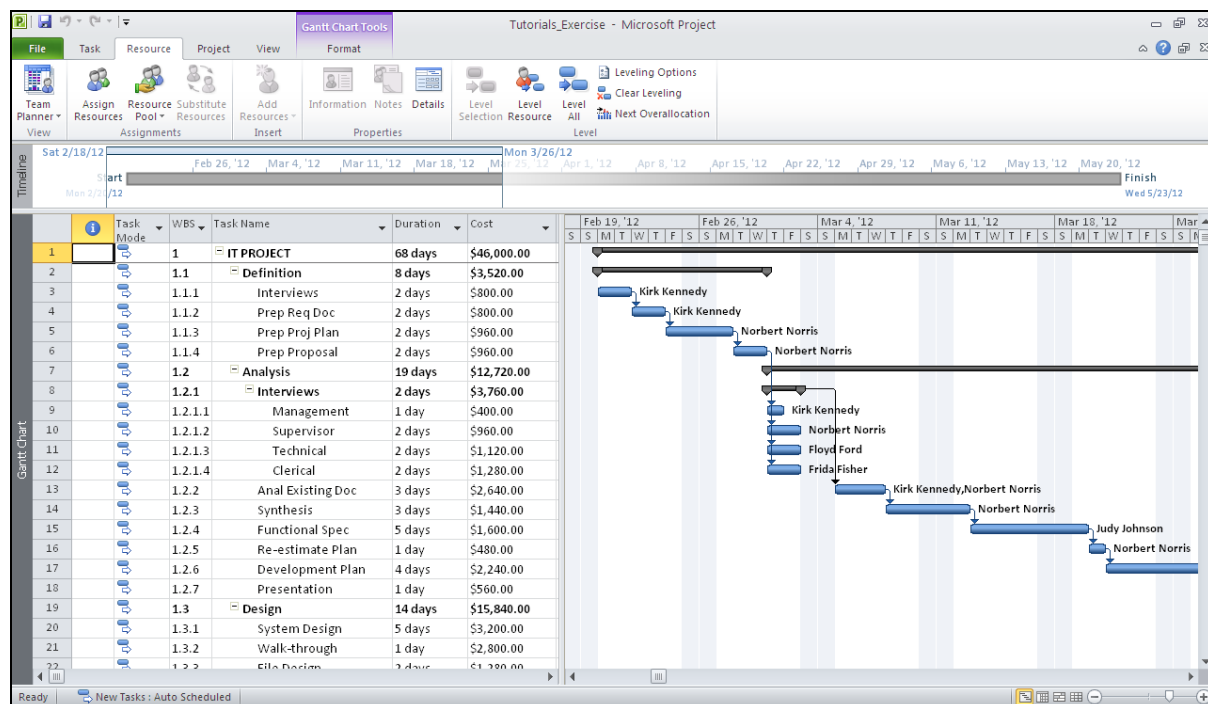
Exercise 2

The Irving Companies are a small conglomerate specializing in health-related businesses, from wholesale planning to in-home health care and medical supplies. The company wants to replace its old legacy systems with an ERP system. The tasks required to do this are the following:

Task	Duration
1. Define the business case	60 days
2. Specify requirements	10 days
3. Select an installer/system integrator	10 days
4. Select an ERP vendor	10 days
5. Install the system	
6. Install phase 1	10 days
7. Install phase 2	10 days
8. Install phase 3	12 days
9. Perform parameterization	
10. Parameterize phase 1	22 days
11. Parameterize phase 2	15 days
12. Parameterize phase 3	14 days
13. Perform testing	
14. Test phase 1 of the system	20 days
15. Test phase 2 of the system	20 days
16. Test phase 3 of the system	30 days
17. Conduct overall testing	5 days
18. Conduct acceptance test	2 days
19. Perform training	
20. Train for phase 1 cut-over	10 days
21. Train for phase 2 cut-over	10 days
22. Train for phase 3 cut-over	12 days
23. Perform cut-over	
24. Perform phase 1 cut-over	2 days
25. Perform phase 2 cut-over	3 days
26. Perform phase 3 cut-over	4 days
27. Assess performance in relation to specs	2 days
28. Closeout	2 days

Implement within Microsoft Project. Determine project duration. Assume one distinct person is assigned to each of the three phases. The person assigned to phase 1 costs $75/hr, while the person assigned to phase 2 costs $95/hr and phase 3 costs $80/hr. Assume all other work is performed by the project manager at $150/hr. Determine the project overall cost. Decide what precedence relationships you will require.

Determine the critical path. Describe some ways to get it completed sooner, without adding resources. Turn in the hardcopy of the Gantt view of your project with the entry table shown and a cost column included in that table.