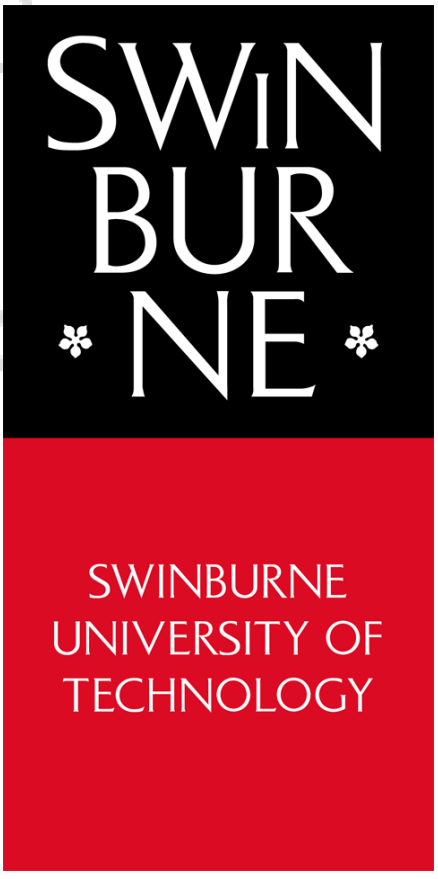
TNE10005/TNE60002

Network Administration

Lab 2

Using MS Project 2016



Aims:

- To plan a simple project using MS Project 2016

Introduction

In this lab we are going to use MS Project 2016 to plan the roll out of a network to a company that is in the process of renewal. New offices are being prepared with new computer hardware.

This company has three branches: Melbourne, Wyndham and Ringwood. The head office will be in Wyndham.

Each branch has at least 10 staff to handle the day to day branch functions. The head office has an additional 10 staff who deal with the company wide issues.

You will be given the responsibility for creating a project plan for the Wyndham head office and designing the addressing plan for the whole network and the LAN for the Administration department in Wyndham.

Launching MS Project

1. From the Metro screen (i.e. the screen with the tiles, not the desktop), type **Project**. When **Microsoft Project 2016** appears in the list of applications, **click the application to launch it**.

Starting a New Project

2. When launched MS Project should arrive at the ***Project*** page. Click on ***Blank Project*** t to create a new project.

   We need to ensure that we set the project dates, otherwise it the project will default to the current date.

3. **Click** on the **Project** tab and then Project Information. Make sure that the start date is set to next Monday. Click **OK** to close.
4. Save the file as **WyndhamBranchNetworkV1.mpp** to your **desktop**

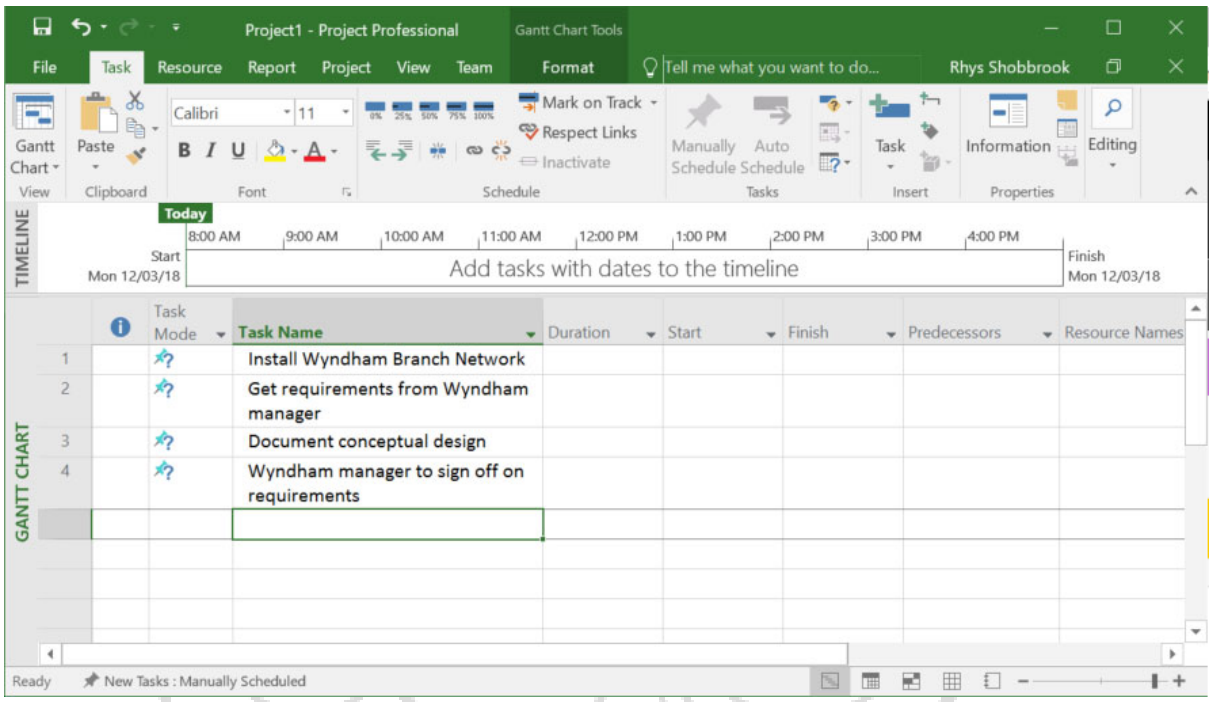
Creating a Work Breakdown Structure

5. Under the column called **task name**, click in a cell and type *Install Wyndham Branch Network* and press **Enter**.
6. Type the following sub-task information in the subsequent cells underneath

   Get requirements from Wyndham manager
   Document conceptual design
   Wyndham manager to sign off on requirements

   (*Hint: Copy and paste might speed things up here, …unless your document is printed. If you don't like copying the formatting and want to paste plain text, choose* ***Paste special…****)*

7. When you are done, it should look something like this:



Lab 2 Figure 1

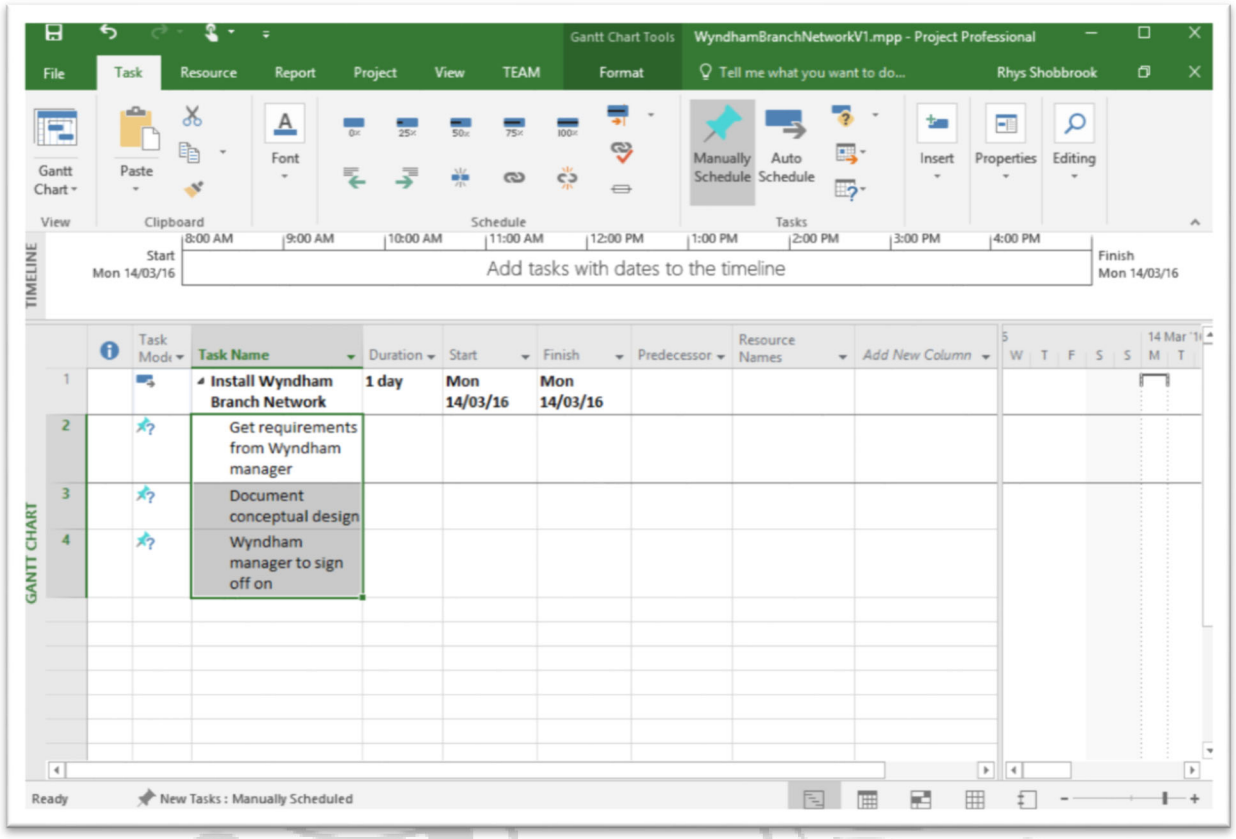
(Note: By default, the task bar will automatically hide itself. If you would like the task bar to stay visible click on the pin icon in the far right of the task bar)

8. In order make these new tasks (2-4) to appear as sub-tasks we need to decrement them. We can do this by highlighting the sub-tasks and either from the **Task** tab by clicking on the right arrow button,

   i.e. 

   Or by pressing the key combination Alt-Shift-Right

   Select task 2-4 and decrement them.



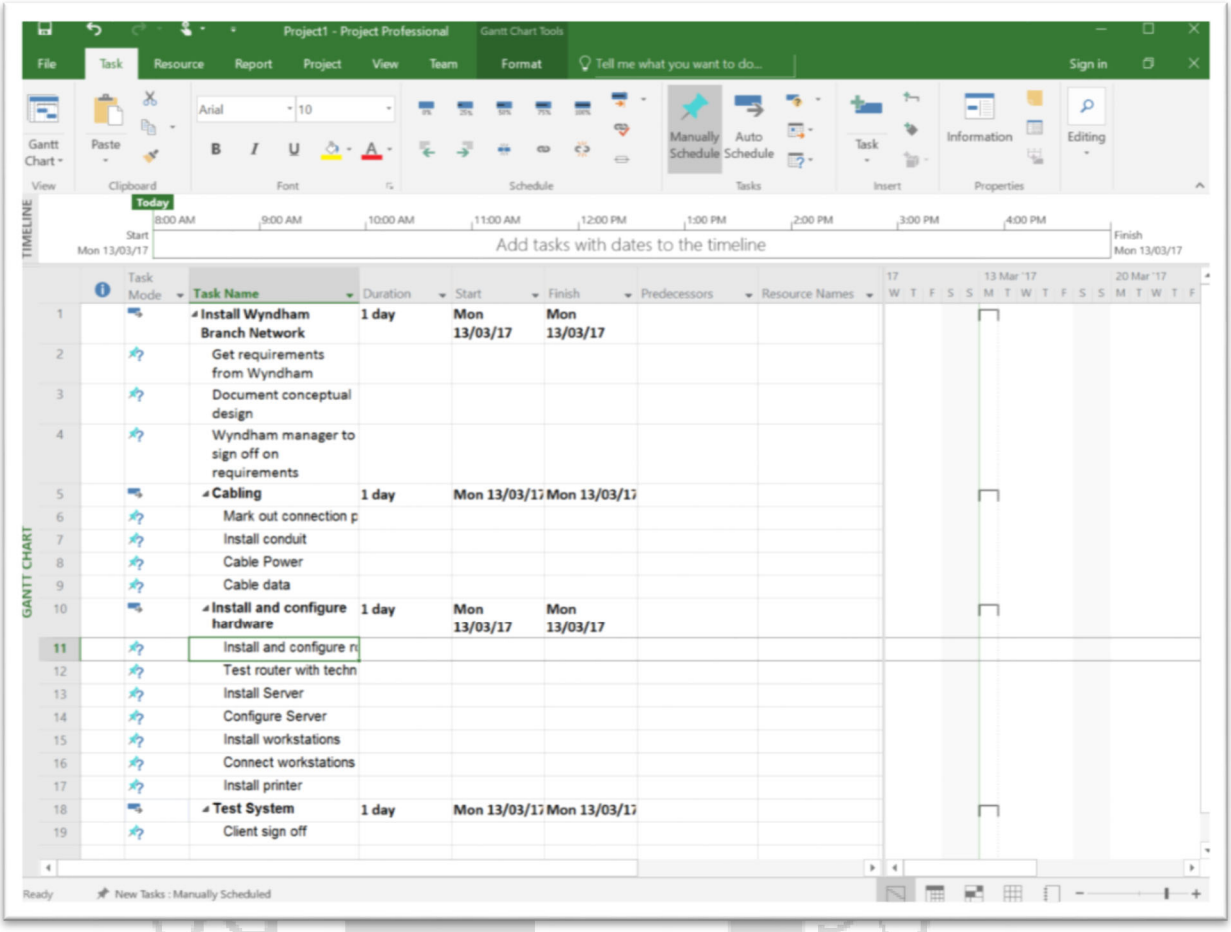
Lab 2 Figure 2

9. Notice that the Install Wyndham Branch Network task now has a box with a '◢' to its left. Clicking on this will collapse all of the subtasks into it. This box will then have a '▷' in it. Clicking on the ▷ will redisplay the subtasks.

10. Now enter the remaining tasks as given in below *(Remember, you can use cut and paste)*

    Cabling
    Mark out connection points
    Install conduit
    Cable Power
    Cable data
    Install and configure hardware
    Install and configure router
    Test router with technician's laptop
    Install Server
    Configure Server
    Install workstations
    Connect workstations
    Install printer
    Test System
    Client sign off

11. Decrement or increment (Alt-Shift-Left arrow) the subtasks to match Lab 2 Figure 3.

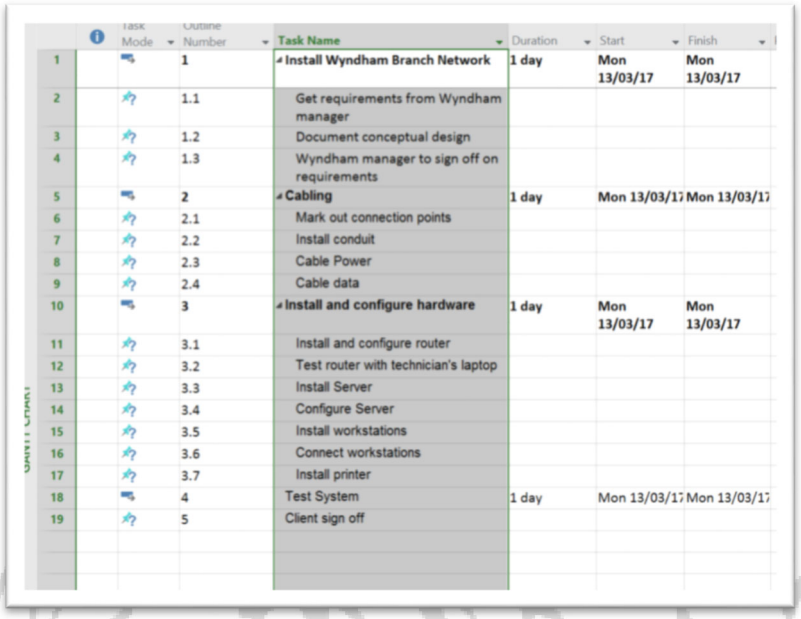


Lab 2 Figure 3

12. For communication purposes it would be more effective to have a numbering system that reflected whether the task was a sub-task or not. Currently the task numbers down the left of our WBS do not indicate this. For example if I was talking about task 16, there is nothing inherent in this that lets you know it belongs to the Install and configure hardware task.

    We will enable outline numbering by right clicking the **Task Name** column header and selecting **Insert Column**. Then scroll down to (or start typing in the search field) **Outline Number.**

13. Our Work Breakdown Structure should now look like this:



	Task Mode	Outline Number	Task Name	Duration	Start	Finish
1		1	**Install Wyndham Branch Network**	1 day	Mon 13/03/17	Mon 13/03/17
2		1.1	Get requirements from Wyndham manager			
3		1.2	Document conceptual design			
4		1.3	Wyndham manager to sign off on requirements			
5		2	**Cabling**	1 day	Mon 13/03/17	Mon 13/03/17
6		2.1	Mark out connection points			
7		2.2	Install conduit			
8		2.3	Cable Power			
9		2.4	Cable data			
10		3	**Install and configure hardware**	1 day	Mon 13/03/17	Mon 13/03/17
11		3.1	Install and configure router			
12		3.2	Test router with technician's laptop			
13		3.3	Install Server			
14		3.4	Configure Server			
15		3.5	Install workstations			
16		3.6	Connect workstations			
17		3.7	Install printer			
18		4	Test System	1 day	Mon 13/03/17	Mon 13/03/17
19		5	Client sign off			

Lab 2 Figure 4

14. We need to now include our estimation of each task's duration.

    We do this by entering the duration in to the 'Duration' column, using the following codes: minutes (m), hours (h), days (d), weeks (w), or months (mo).

    So half a day would be entered as 0.5d

15. For task 1.1 enter 0.5d, for task 1.2 enter 1d, and for task 1.3 enter 2h.

    Notice that when every subtask has a duration, the summary task's duration is a summation of the subtasks (Note: If it does not summarise the duration of the tasks, in the **Task Mode** column right click the parent task row and select **Auto Schedule**).

16. Now enter the following durations.

Mark out connection points	**2 hrs**
Install conduit	**1 day**
Cable Power	**1 day**
Cable data	**1 day**
Install and configure hardware	
Install and configure router	**2 hrs**
Test router with technician's laptop	**1 hr**
Install Server	**0.5 days**
Configure Server	**0.5 days**
Install workstations	**0.25 days**
Connect workstations	**0.5 days**
Install printer	**1 hr**
Test System	**1 day**
Client sign off	**1 hr**

17. Save the project

Creating a Gantt chart

You may notice light blue bars down the right hand side of the window.

(If you cannot see them try zooming in by clicking on the '+' in the bottom right hand corner of the window).

These bars indicate when each task is to occur. In our current Gantt chart they are all aligned in a single column.

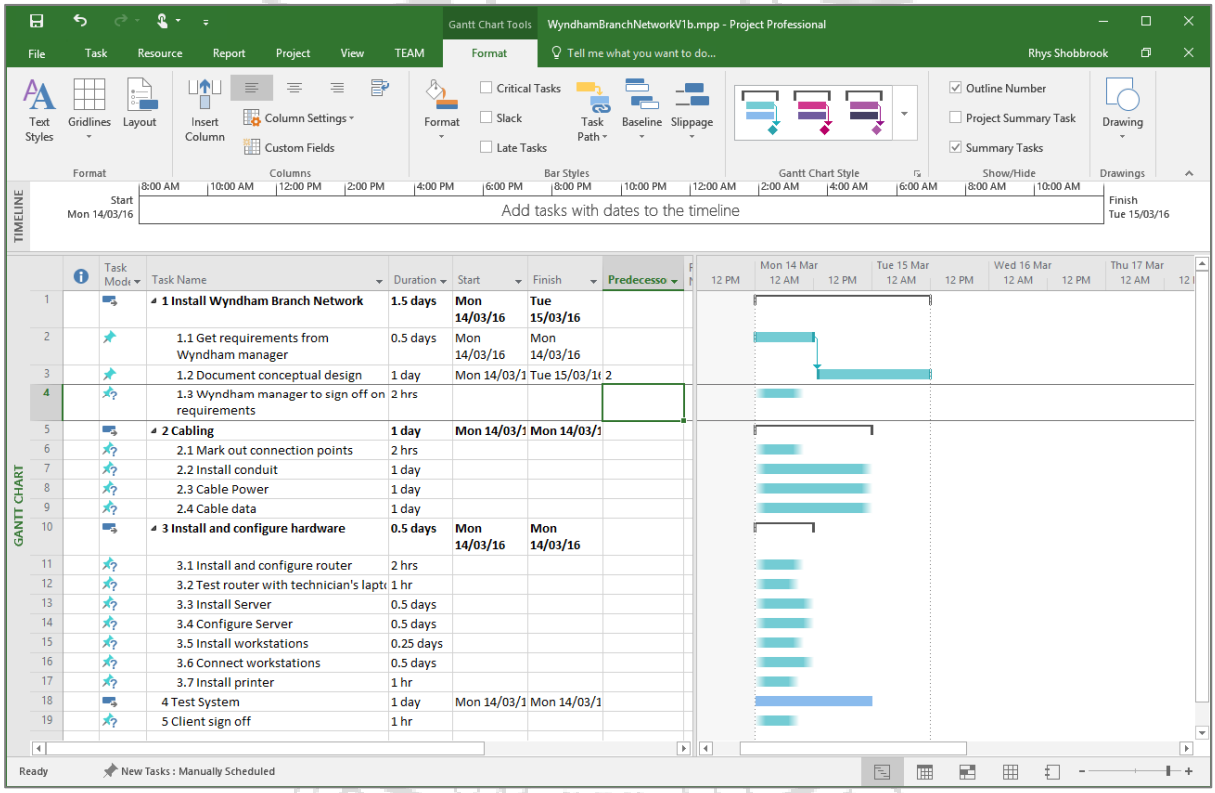
If we were working of this project plan, as it currently stands all tasks need to start at the same time.

Obviously this is not possible.

We need to sequence our task. We need to set what tasks need to occur first.

We do this by entering a Predecessor for each task.

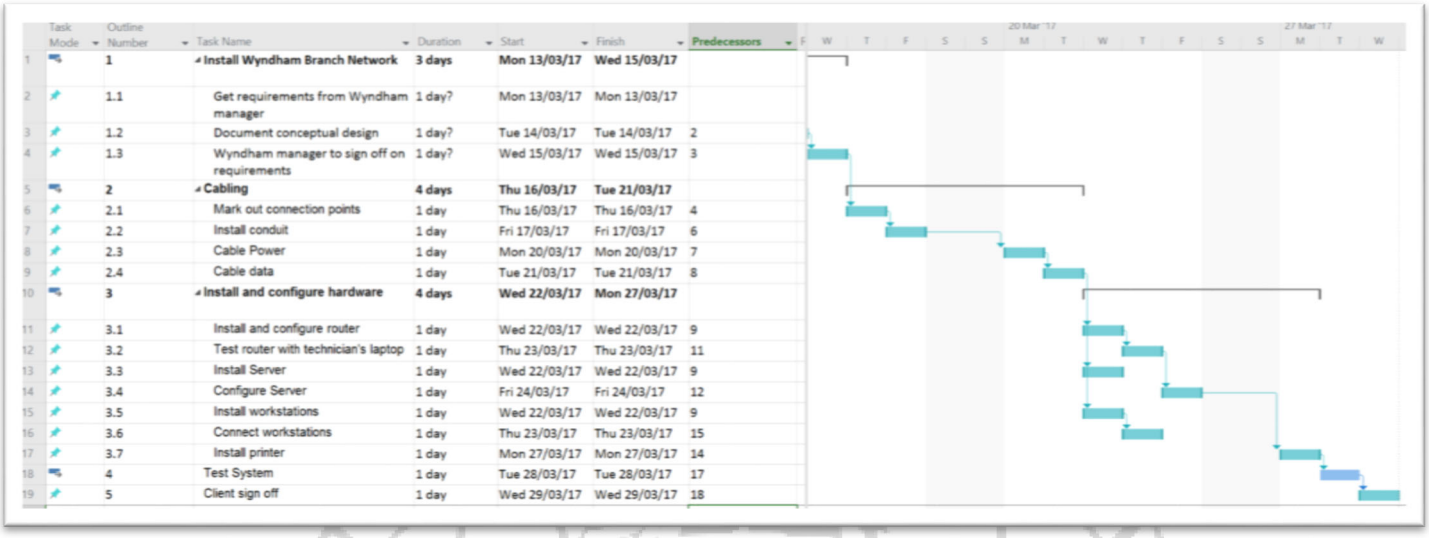
18. Let's look at tasks 1.1-1.3. Task 1.3 is *Wyndham manager to sign off on requirements*. Obviously the requirements must be defined (1.1) and documented (1.2) before the manager can sign off on the requirements.
19. The predecessor for task 1.2 is task 1.1. To enter this, click the cell in the predecessor column for task 1.2.
20. Enter the number on the far left column of the window. In this case we would enter **2** (and not the task number 1.1)



Lab 2 Figure 5

Notice that the blue bar for this task has now shifted to the right and an arrow points from the predecessor.

21. Enter the other predecessors as they have been entered in Lab 2 Figure 6



	Task Mode	Outline Number	Task Name	Duration	Start	Finish	Predecessors
1		1	**Install Wyndham Branch Network**	**3 days**	**Mon 13/03/17**	**Wed 15/03/17**	
2		1.1	Get requirements from Wyndham manager	1 day?	Mon 13/03/17	Mon 13/03/17	
3		1.2	Document conceptual design	1 day?	Tue 14/03/17	Tue 14/03/17	2
4		1.3	Wyndham manager to sign off on requirements	1 day?	Wed 15/03/17	Wed 15/03/17	3
5		2	**Cabling**	**4 days**	**Thu 16/03/17**	**Tue 21/03/17**	
6		2.1	Mark out connection points	1 day	Thu 16/03/17	Thu 16/03/17	4
7		2.2	Install conduit	1 day	Fri 17/03/17	Fri 17/03/17	6
8		2.3	Cable Power	1 day	Mon 20/03/17	Mon 20/03/17	7
9		2.4	Cable data	1 day	Tue 21/03/17	Tue 21/03/17	8
10		3	**Install and configure hardware**	**4 days**	**Wed 22/03/17**	**Mon 27/03/17**	
11		3.1	Install and configure router	1 day	Wed 22/03/17	Wed 22/03/17	9
12		3.2	Test router with technician's laptop	1 day	Thu 23/03/17	Thu 23/03/17	11
13		3.3	Install Server	1 day	Wed 22/03/17	Wed 22/03/17	9
14		3.4	Configure Server	1 day	Fri 24/03/17	Fri 24/03/17	12
15		3.5	Install workstations	1 day	Wed 22/03/17	Wed 22/03/17	9
16		3.6	Connect workstations	1 day	Thu 23/03/17	Thu 23/03/17	15
17		3.7	Install printer	1 day	Mon 27/03/17	Mon 27/03/17	14
18		4	Test System	1 day	Tue 28/03/17	Tue 28/03/17	17
19		5	Client sign off	1 day	Wed 29/03/17	Wed 29/03/17	18

Lab 2 Figure 6

22. Please be aware that some tasks may have multiple predecessors. Let me share an example based on one of my first project blunders. You can't install the workstations until the power has been cabled, data has been cabled and… (this is the one I forgot) the furniture is delivered.

    In this situation you would enter the predecessor tasks separated by a comma. For example: 7,8,9.

23. Sometimes a predecessor does not have to be completely finished before a subsequent task can begin.

    Look at the example of the cabling.

    We have the following tasks.

    - Mark out connection points
    - Install conduit
    - Cable Power
    - Cable data

    If we are cabling a large office with many rooms then sometimes it is possible to start in one room while the previous task is finishing in another. For example, once the connection points have been marked out in Room A, Room B can start being marked out. While Room B is being marked out, the conduit can be installed in Room A.

    Our aim is to improve the efficiency of our project plan.

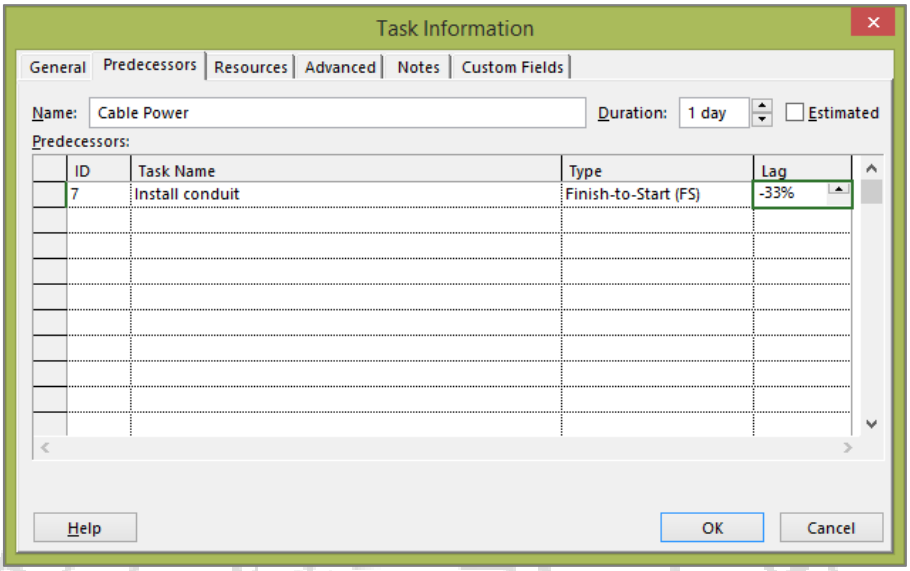
    If there can be overlap in the tasks, then we can start and finish subsequent tasks earlier.

    To do this we need to configure a **lead time** for the predecessor field.

    Cabling the power can begin before all of the conduit has been installed. This means we can configure a lead time for this predecessor.

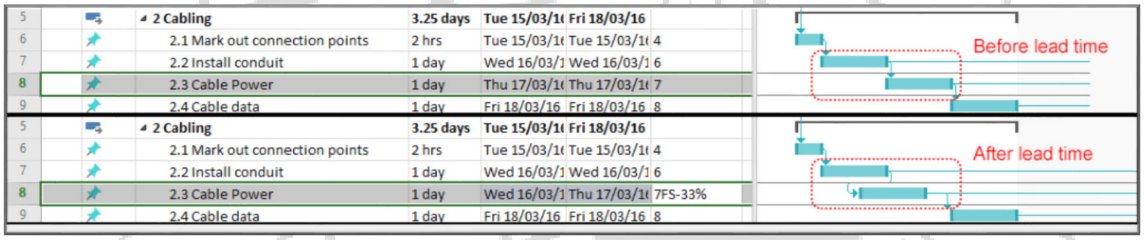
24. Double click on task 2.3 Cable Power (or go to the **Task** tab and select Information).

25. On the **Predecessors** tab, there is a field called **lag**. Click in here and type -33%.



Lab 2 Figure 7

26. Press **OK** and observe the change to the Gantt bar for task 2.3.



Lab 2 Figure 8

Notice that the predecessor arrow now points a third of the way into task 2.3?

This means that the cabling of the power is expected to begin when the installation of the conduit is 2/3's complete. Ironically, we have configured a **lead** time in the lag field.

27. Add a 33% lead time for the 2.4 Cable data task (i.e. a -33% lag time)

On other occasions we need a lag time between tasks.

The classic example is when painting inside a house. It might only take a day in which to do the painting, but the paint must fully dry before anything is put up against the walls.

So if you configure a duration of 3 days for painting the house, no task will begin until the paint is dry. The problem with this approach is that all of the resources assigned to this task will be tied up in the plan. If you are hiring painters to come in to do the painting, then Project will budget for them to be paid for 3 days instead of just 1.

So in this case it would be better to configure a 2-day lag after the completion of the painting.

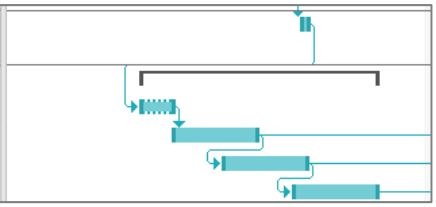
In this project we have a similar problem with task 1. The manager must sign off on the requirements. We cannot expect that the manager will sign off on the requirements immediately they are given the documentation.

They need to read the documentation, sometimes seeking legal advice before they sign it.

So in this project we are going to estimate that it will take the manager 2 days in which to read, consult and sign off on the requirements.

28. Double click on task 1.3 and add a lag time of 2 days.
29. If you look closely we now have a problem:

4		1.3 Wyndham manager to sign off on requirements	2 hrs	Thu 17/03/16	Thu 17/03/16	3FS+2 days
5		**2 Cabling**	**2.59 days**	**Tue 15/03/1(**	**Fri 18/03/16**	
6		2.1 Mark out connection points	2 hrs	Tue 15/03/1(	Tue 15/03/1(	4
7		2.2 Install conduit	1 day	Wed 16/03/1	Wed 16/03/1	6
8		2.3 Cable Power	1 day	Wed 16/03/1	Thu 17/03/1(	7FS-33%
9		2.4 Cable data	1 day	Thu 17/03/1(	Fri 18/03/16	8FS-33%



Lab 2 Figure 9

Notice that **Cabling** is now scheduled to begin Monday, the day before the Wyndham manager has signed off.

This is because the scheduling is currently set to manual. We can tell this because the **Task Mode** column has thumb tacks (i.e.).

30. Select all tasks, by clicking at the head of the **Task Mode** column.

    Then choose the **Task** tab and click **Auto Schedule.**

31. Save the file as WyndhamBranchNetworkV2.mpp to your desktop

    We now have a detailed plan for managing the **time** of this small project.

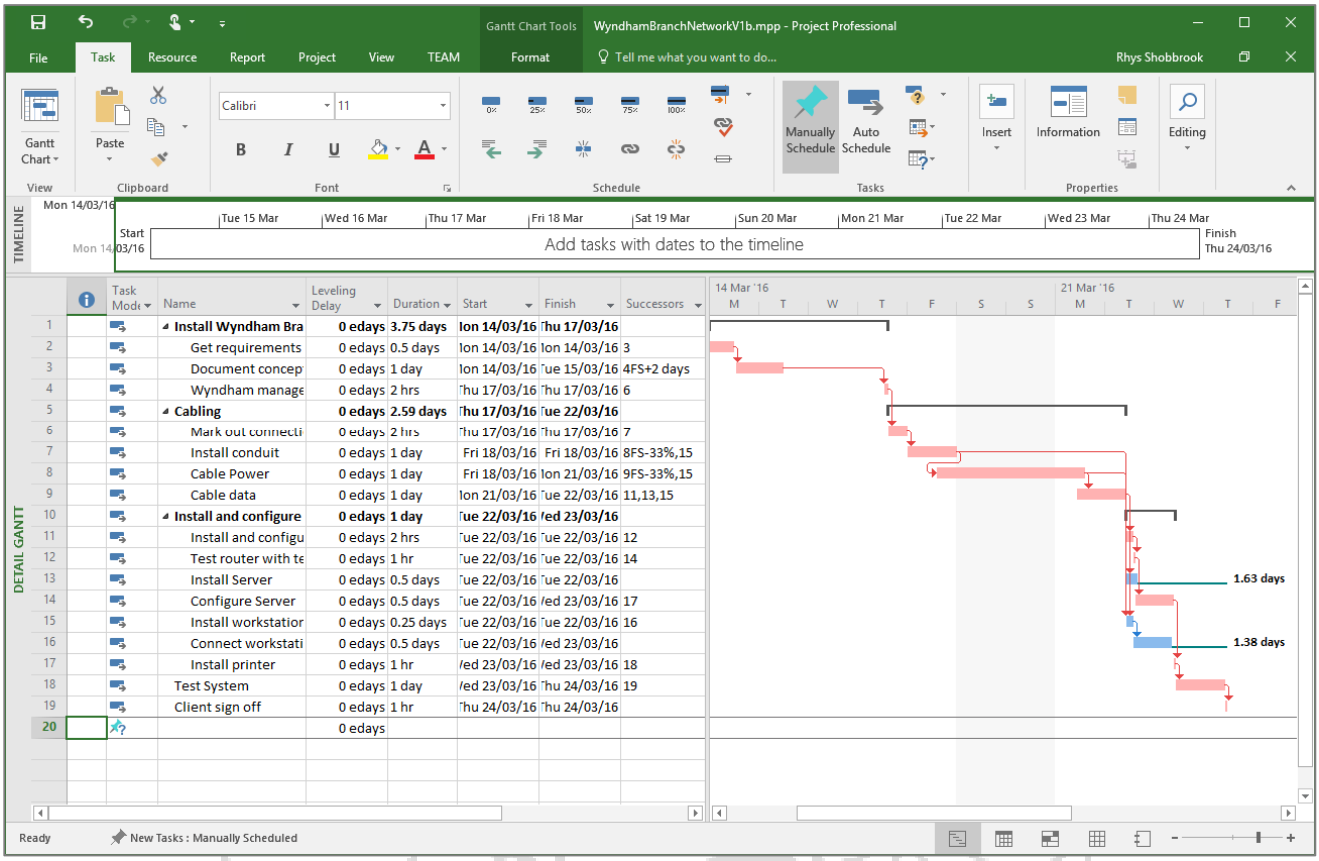
Determining the Critical Path

This is a simple project. Consequently, it will not be a good example of how **Critical Path Analysis** can help us manage our projects.

Critical path analysis finds the sequence of activities that ultimately determine the length of the project. If any of these activities fall behind schedule the whole project falls behind schedule.

Some like to think of it as the shortest path through the Gantt chart.

32. To view the critical path, from the **View** tab, Click down on the Gantt Chart button (top left), Select More Views, then **Detail Gantt**



Lab 2 Figure 18

Notice that some of the Gantt bars have become red (OK, nearly all are red, as I said above this simple project is not a good example of how useful Critical Path is).

These red tasks are the tasks that determine the earliest the project can finish.

This is a very powerful tool in more complex projects.

For example, if two project tasks are competing for the same resource then you don't take the resources away from the red tasks. If you do the whole project falls behind.

The blue tasks are the tasks that have some scheduling flexibility, hence we would in a considered manner give resource priority to the red tasks.

Managing Resources and Costs

As we know from last week's lecture, there are more areas in managing a project than just managing time.

Managing costs and resources are also important.

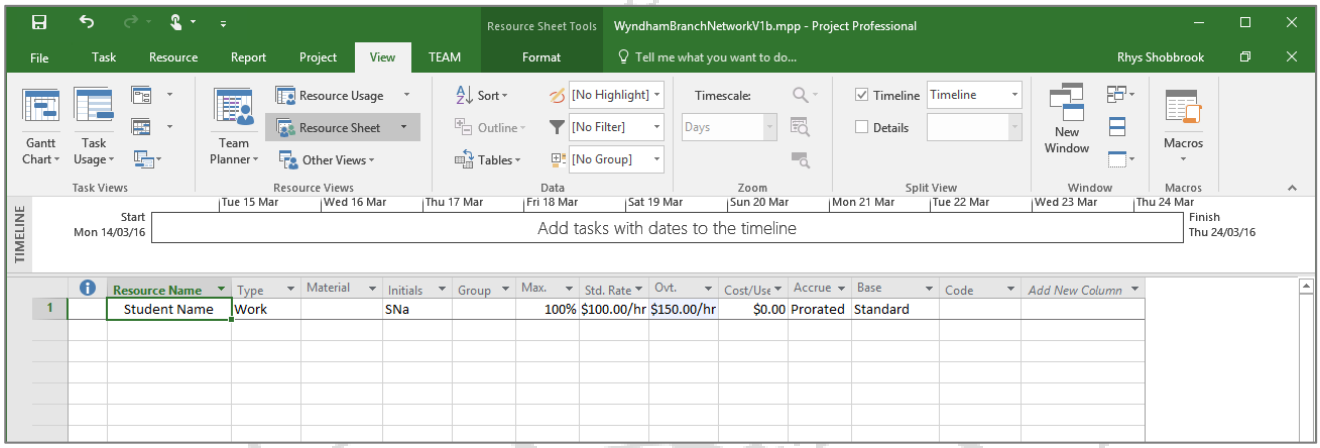
MS Project is also a valuable tool for managing these areas.

33. Go to the **View** tab and click on **Resource Sheet**.

    We will enter two types of resources. Human resources, which we enter as *Work* and material resources, such as servers, PC's, etc. which we will enter as *Material*.

The data requirements for each type are slightly different.

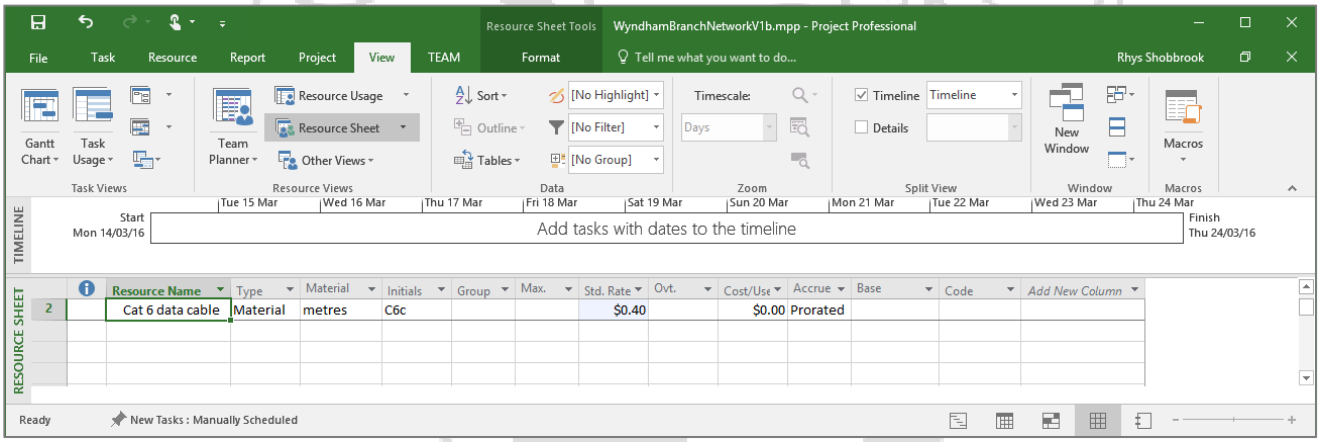
34. Enter **your** details as the first resource. You will be represented in the figures as **Student Name.** *(Obviously yours will differ and will display the name you enter)*. Enter the remaining data as presented in Figure 10.



Lab 2 Figure 10

for material resources only. The default unit for human resources is hours. There is no default unit for material resources as it varies with each.

35. Add the following details for the data cable



Lab 2 Figure 11

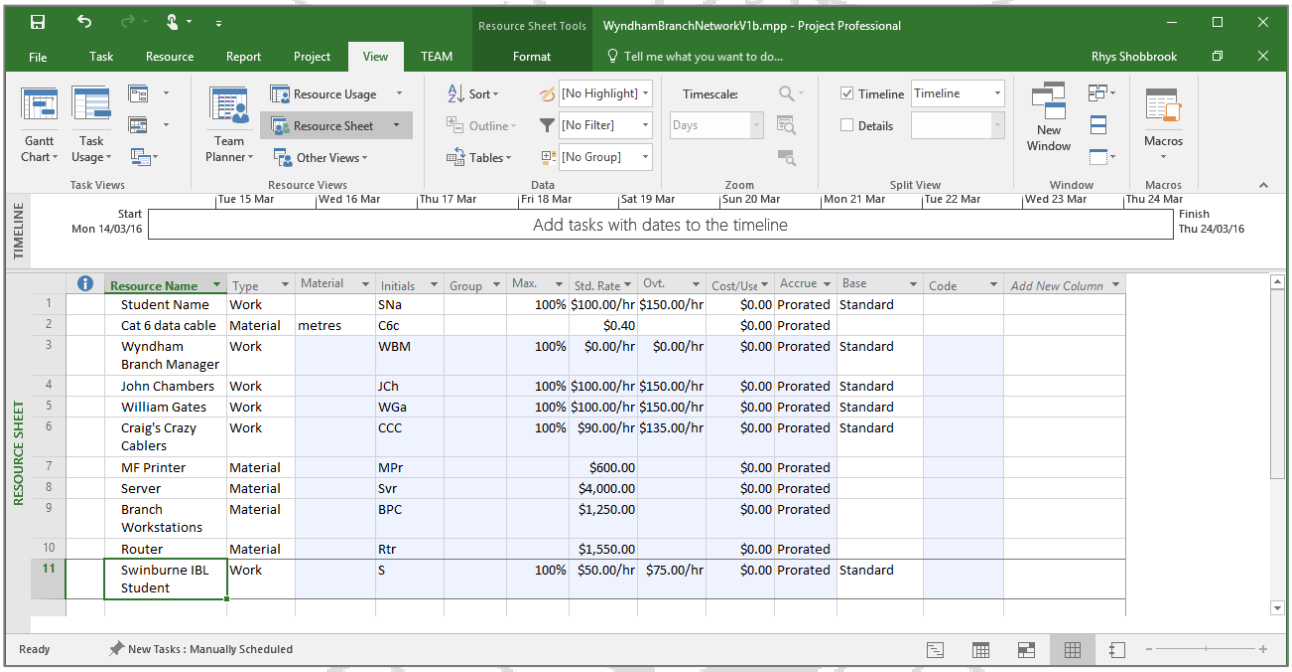
Notice that we cannot enter any data into the Max. units, Ovt Rate fields.

In this situation we have told project that our Cat6 data cable will cost $0.40 per metre.

36. Enter in the remaining resource information as follows
(hint: copy & paste the green text)

Resource Name	Type	Material Label	Initials	Group	Max Units (availability)	Standard rate	Overtime rate
Student Name	Work		SNa		100%	$100.00/hr	$150.00/hr
Cat 6 Cable	Material	metres	C6c			$0.40	
Wyndham Branch Manager	Work		WBM		100%	$0.00/hr	$0.00/hr
John Chambers	Work		JCh		100%	$100.00/hr	$150.00/hr
William Gates	Work		WGa		100%	$100.00/hr	$150.00/hr
Craig's Crazy Cablers	Work		CCC		100%	$90.00/hr	$135.00/hr
MF Printer	Material	units	MPr			$600.00	
Server	Material	units	Svr			$4,000.00	
Branch Workstations	Material	units	BPC			$1,250.00	
Router	Material	units	Rtr			$1,550.00	
Swinburne IBL Student	Work		S		100%	$50.00/hr	$75.00/hr

37. Your resources should now look as follows:



Lab 2 Figure 12

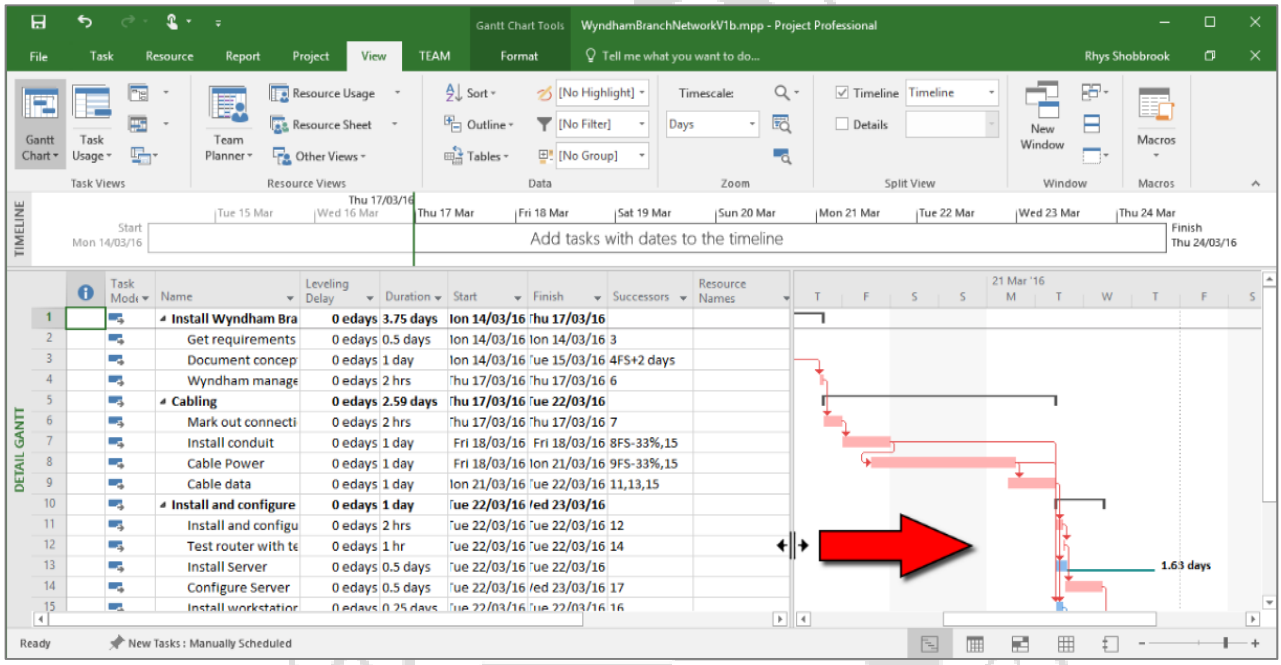
We can document important information about the resource that may not fit into Project's categories, but are still important for our project.

38. Save the file as WyndhamBranchNetworkV3.mpp to your desktop

Assigning Resources

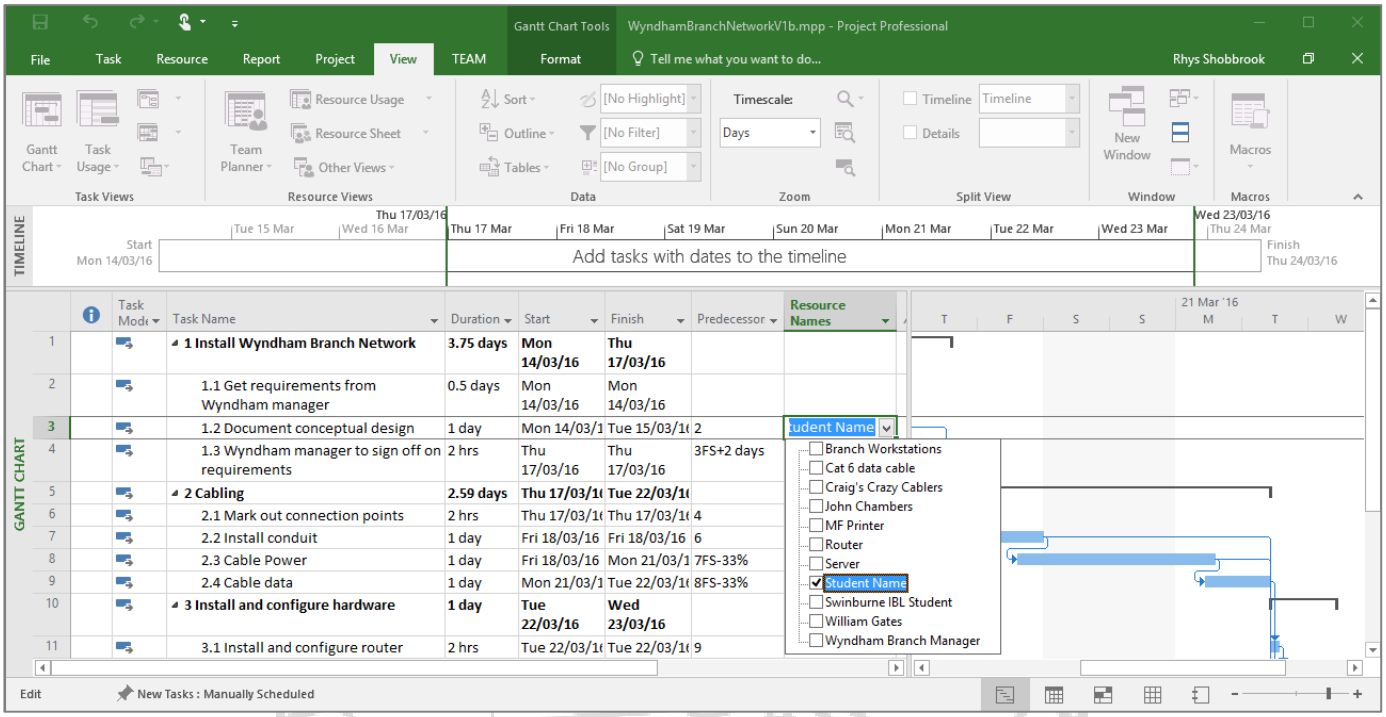
39. For assigning a single resource to an activity we can use the Gantt Chart view (remember to click on the Gantt Chart button in the top left, this time use the standard *Gantt Chart* view and don't use *Detailed Gantt*). The column to the right of the Predecessor column is called Resource Names. If your screen is small, it may be being covered by the Gantt chart. Move your mouse over the border between the WBS and the Gantt chart until it becomes this shape

    and drag to the right to reveal the Resource Names column.



Lab 2 Figure 13

40. Adjacent to task 1.2. Click in the cell in the Resource Names column and drop down to reveal the different resources available to assign. Click on the name you entered for yourself in step 34 to allocate yourself to this task.



Lab 2 Figure 14

41. MS Project 2016 provides a drop down list that will let you select multiple resources for the task
42. If you have time, assign resources for the other tasks, remembering that the tasks 3.3 and 3.7 also need to have material resources allocated to them. Conversely tasks 3.2, 3.4 and 3.6 do not need to have material resources assigned to them. These material resources were assigned in the previous step. If we assigned them again, they would be counted twice in our budget.

43. Save the file as WyndhamBranchNetworkV4.mpp to your desktop

    Please be aware that we do not need to assign resources to **summary** tasks.

Extension

Add tasks so that the installation of the Melbourne and Ringwood branches are also planned for.

End of Lab