# MS Project Professional 2021

**Tutorial #1– The Overview**

CS 587 – Software Project Management
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# MS Project Professional 2021 Overview

- MS Project Professional is a very powerful and common tool to create a project plans.

- It helps you to efficiently organize your resources, deadlines and other important aspects such as compensation details, project constraints etc.

- The more information you provide, the more accurate will be your project plan.

# MS Project 2021 Supported OS

**Windows users:**

- Supported OS: Windows 10,Windows 8, Windows 2008R2 with .Net 3.5 or greater.

**MAC users:**

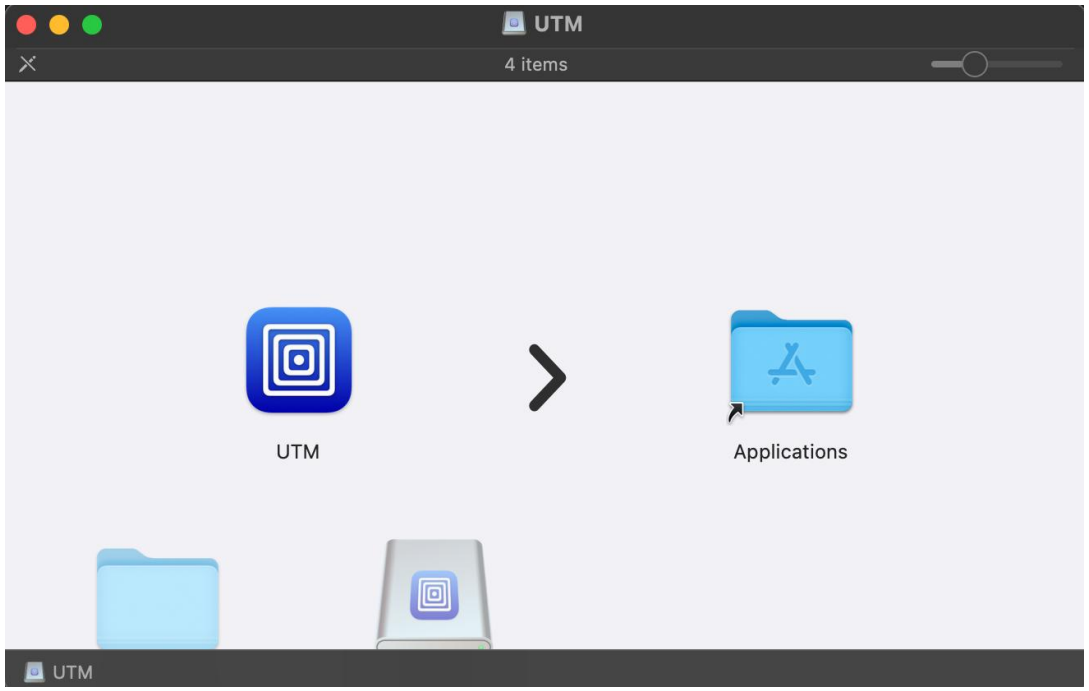
- Either install Windows on a virtual machine *(VirtualBox, , UTM, Parallels desktop or VMware ).*
- Or use Apple's Boot Camp (http://www.apple.com/support/bootcamp/)

**Linux users:**

- Either install Windows on a preferred virtual machine.
- Or install Windows OS on a separate partition to use the software.

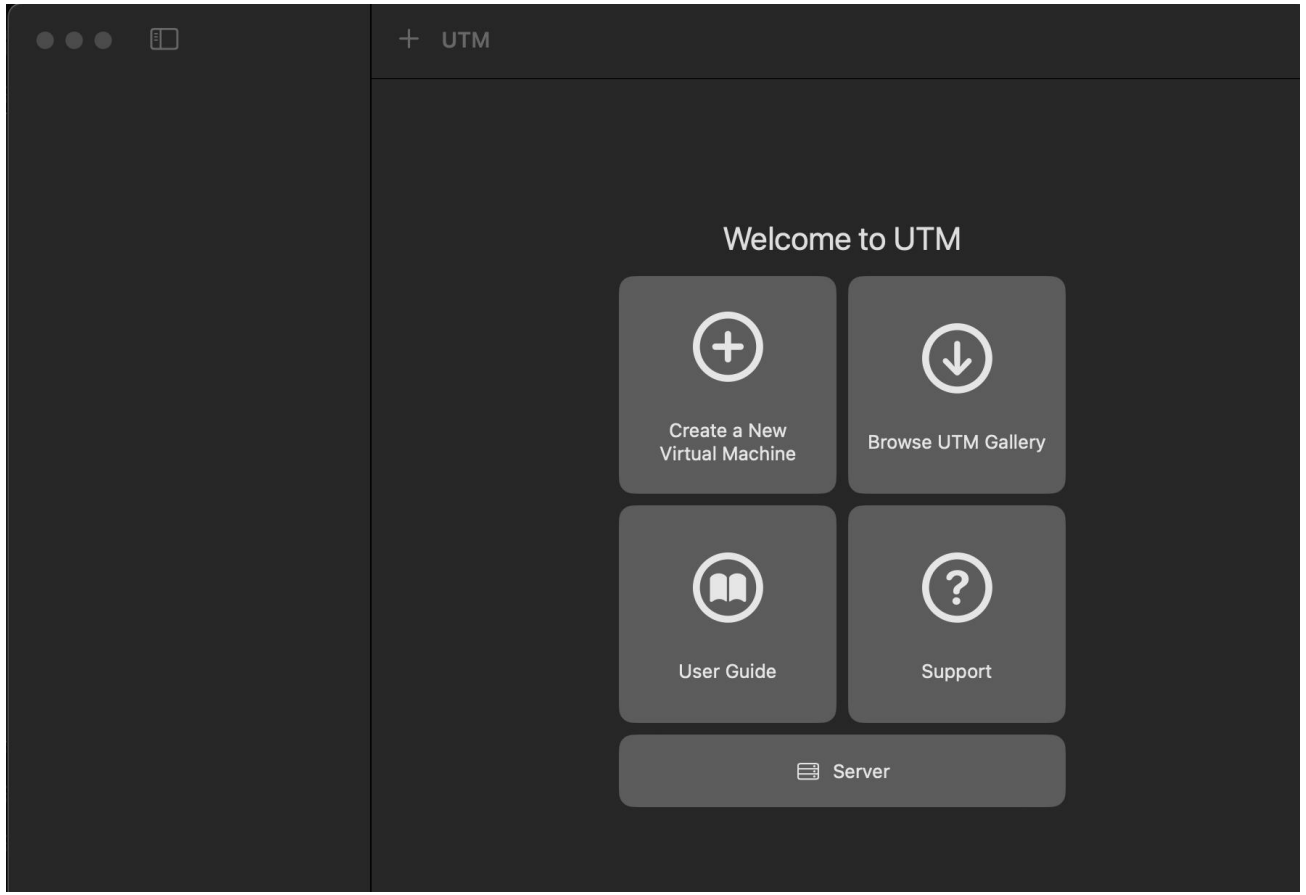
# UTM for MAC and Linux users

- You can download UTM from https://mac.getutm.app/
- The image of Windows OS can be downloaded from the following URL https://www.microsoft.com/en-us/software-download/windowsinsiderpreviewARM64




- Drag and drop the UTM app to Applications folder
- Run UTM
- Click “Create a new Virtual Machine” to create new virtual machine
- Click on ‘Virtualize’, Select Windows and select the downloaded windows image
- Specify Memory size
- Complete the Windows Setup

# UTM for MAC and Linux users



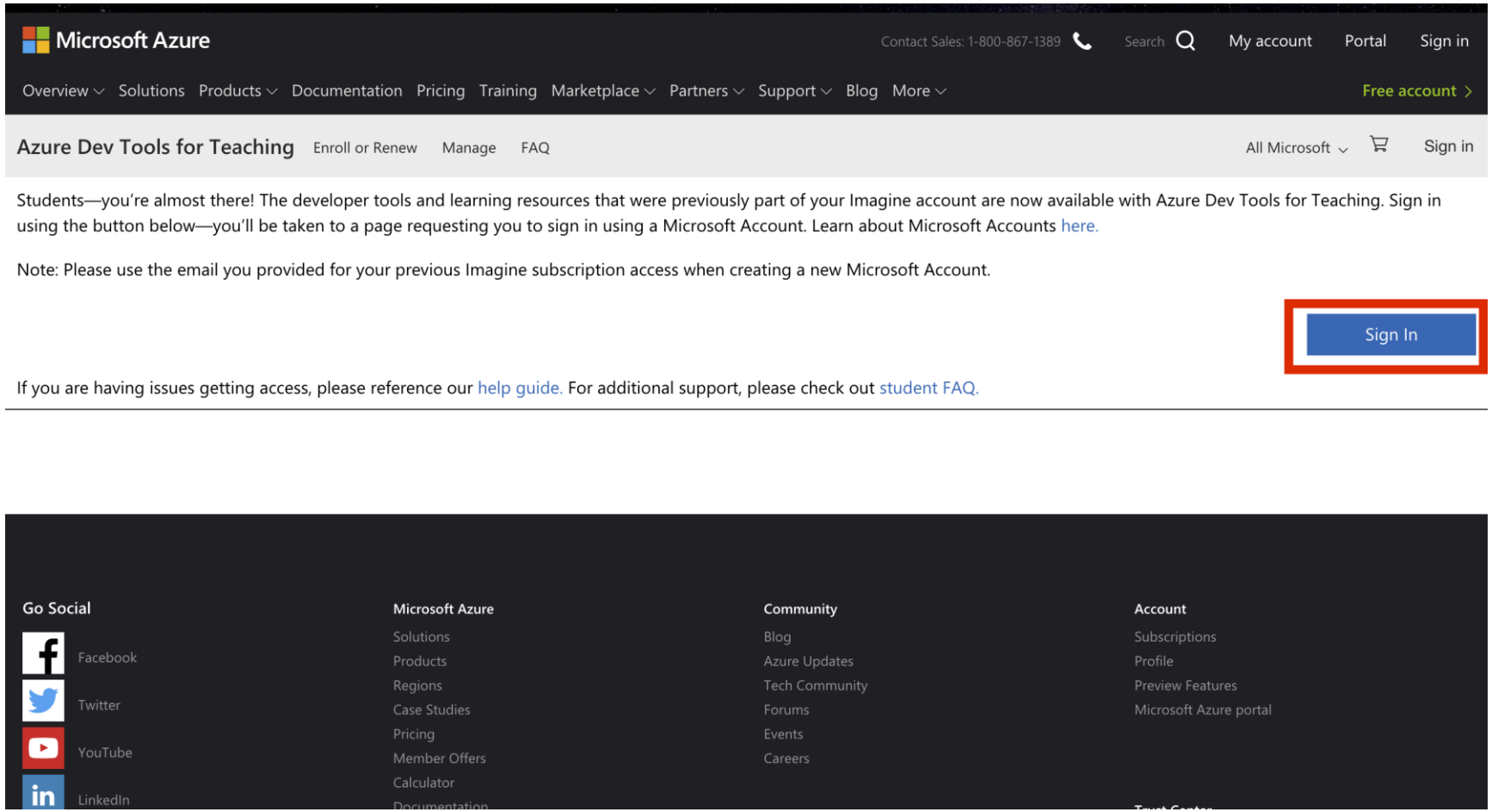

- While setting up windows if you face issue with network driver, type fn+shift+f10 and execute oobe\bypassrno command
- This command bypasses the internet requirement,Now the VM restarts and now we get an option “I don’t have internet”. Click on that and complete the setup
- Install Spicetools using this link https://github.com/utmapp/qemu/releases/download/v7.0.0-utm/spice-guest-tools-0.164.4.iso
- Then mount it to UTM and install it to fix all the Issues related to graphics, internet etc

# Download the software

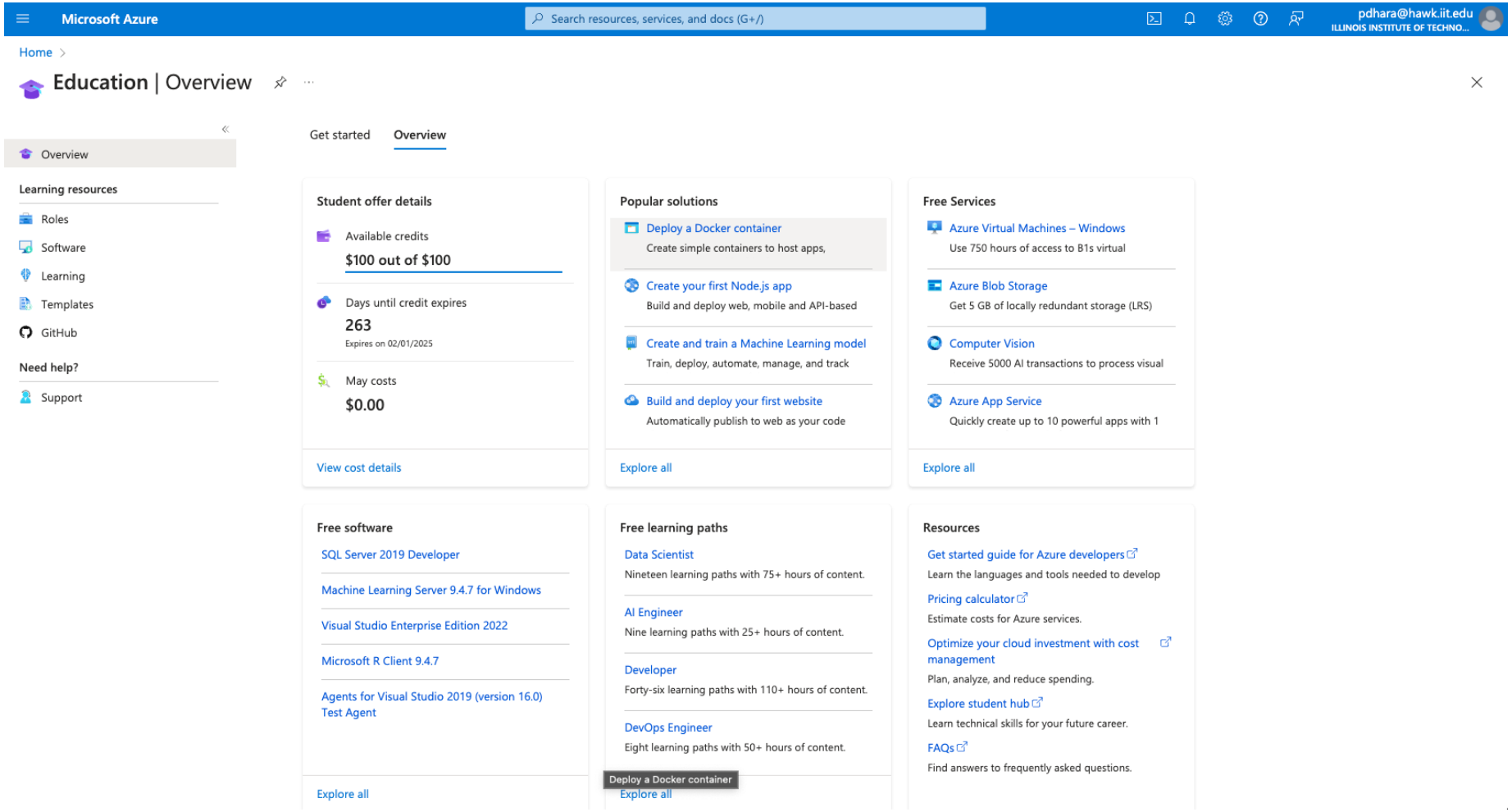
- Download the project professional 2021 using following URL.
- URL: https://azureforeducation.microsoft.com/devtools
- Login is usually the university email address, e.g., abc@hawk.iit.edu. For first time login, sign up with different email ID and activate your student account (hawk) once logged in.
- After you log in, look for Project Professional 2021 in Learning Resources tab under Software, and download the software.
- ***Copy and save the Product Key***
- Follow the steps on the website for downloading the software

# Step 1: Log in to Azure.

- Using the link: https://azureforeducation.microsoft.com/devtools

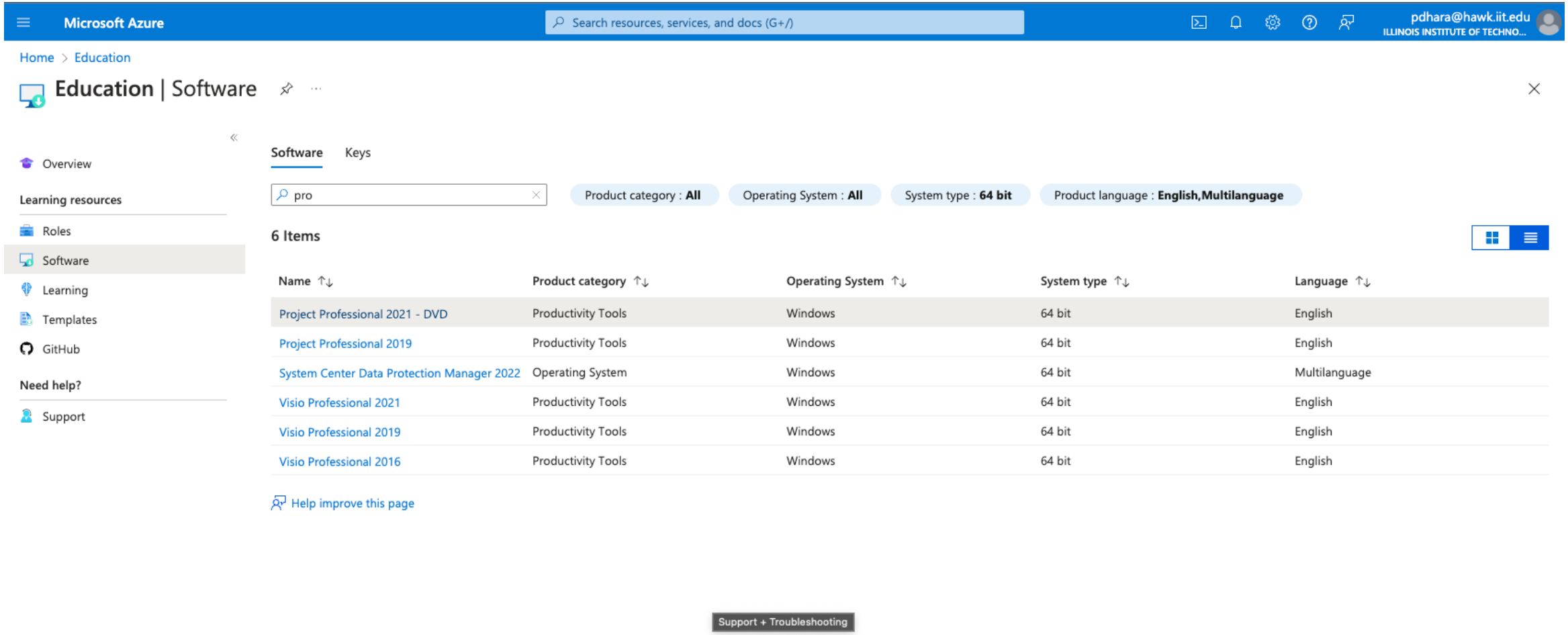


# Step 2: Add your Student Account to access the software

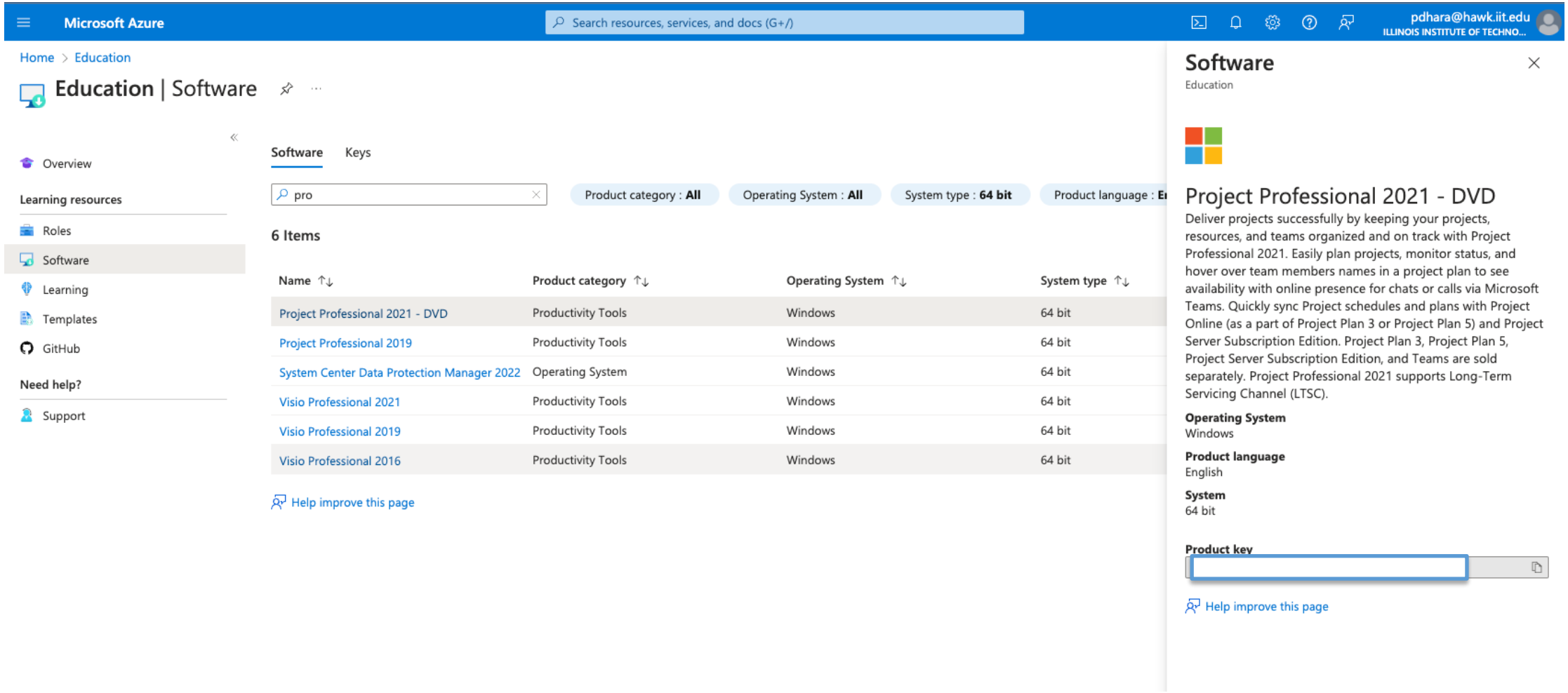


# Step 3: Find the software

- Find the software and download it. Make sure to download the 2021 version.



# Step 4: Copy and save the key, then download it.

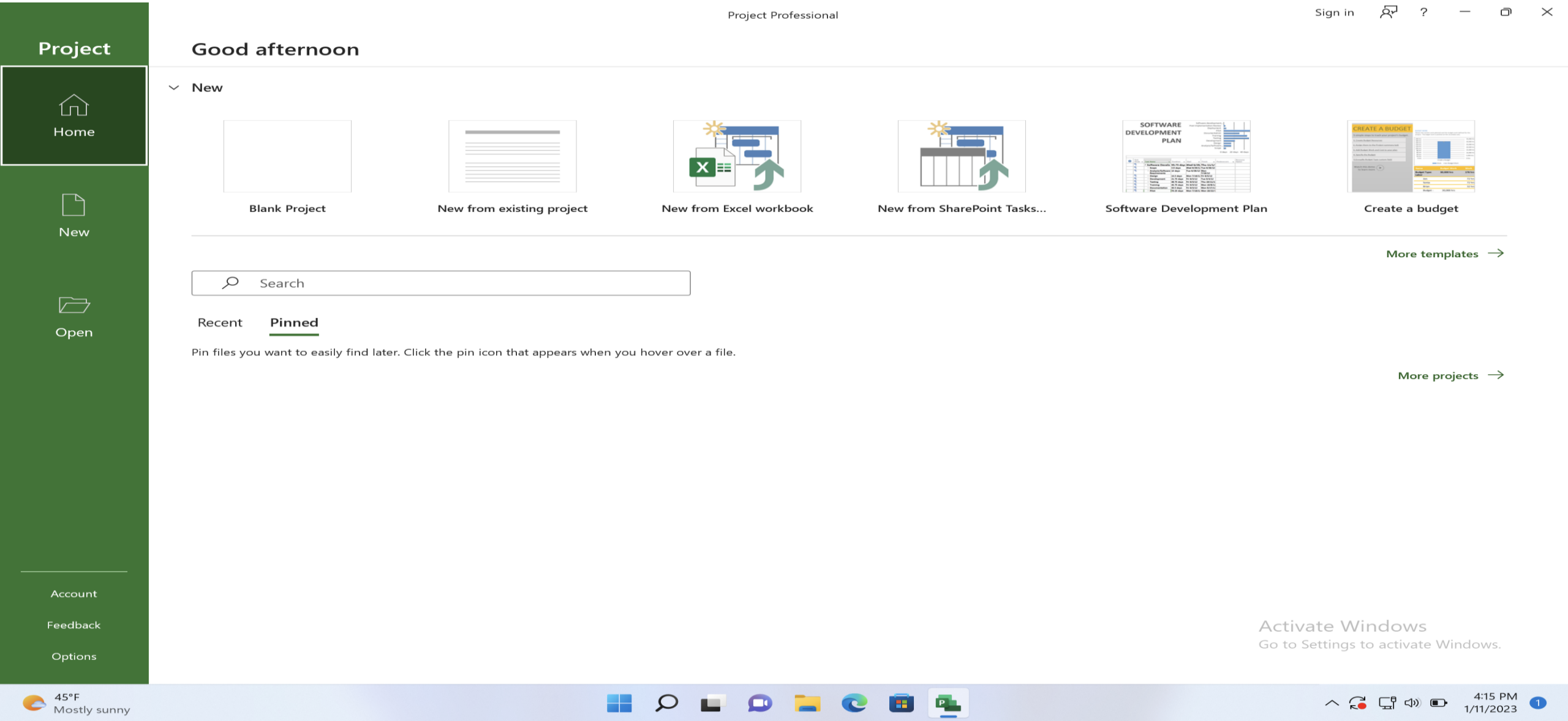



- Copy the Project 2021 iso file to the Windows running on UTM and install the software

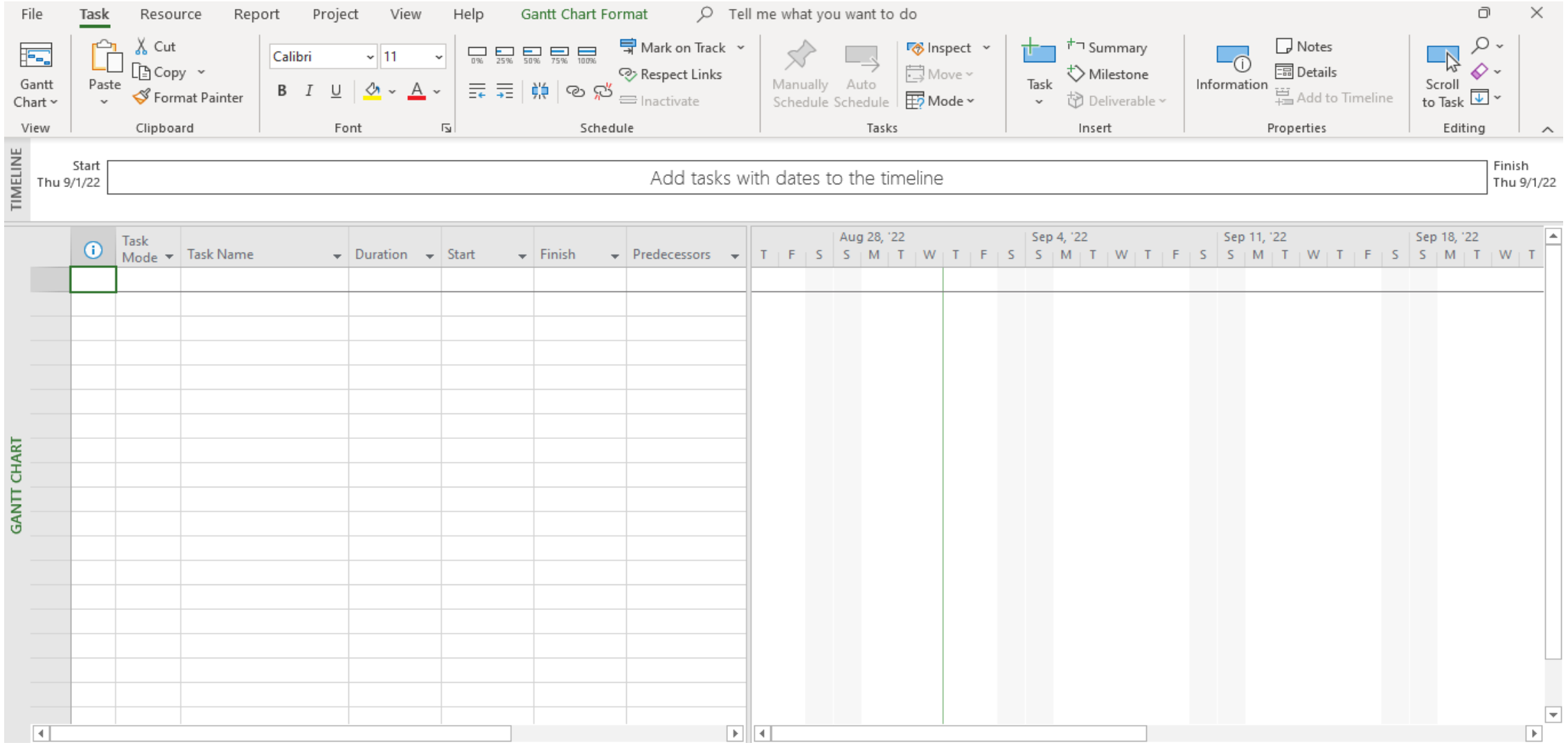
# Step 4: Installation

- Run the setup file, this will start the Microsoft Project Professional 2021 installation
- Agree to license and install the software
- After installation, you may need to restart the computer
- You should now be able to access Project Professional under Microsoft Office products containing Office, Excel, etc.
- When you open MS Project 2021 for the first time, register the product **using the Product key copied from Azure for Education**

# Project 2021 After installation



# Blank Project:

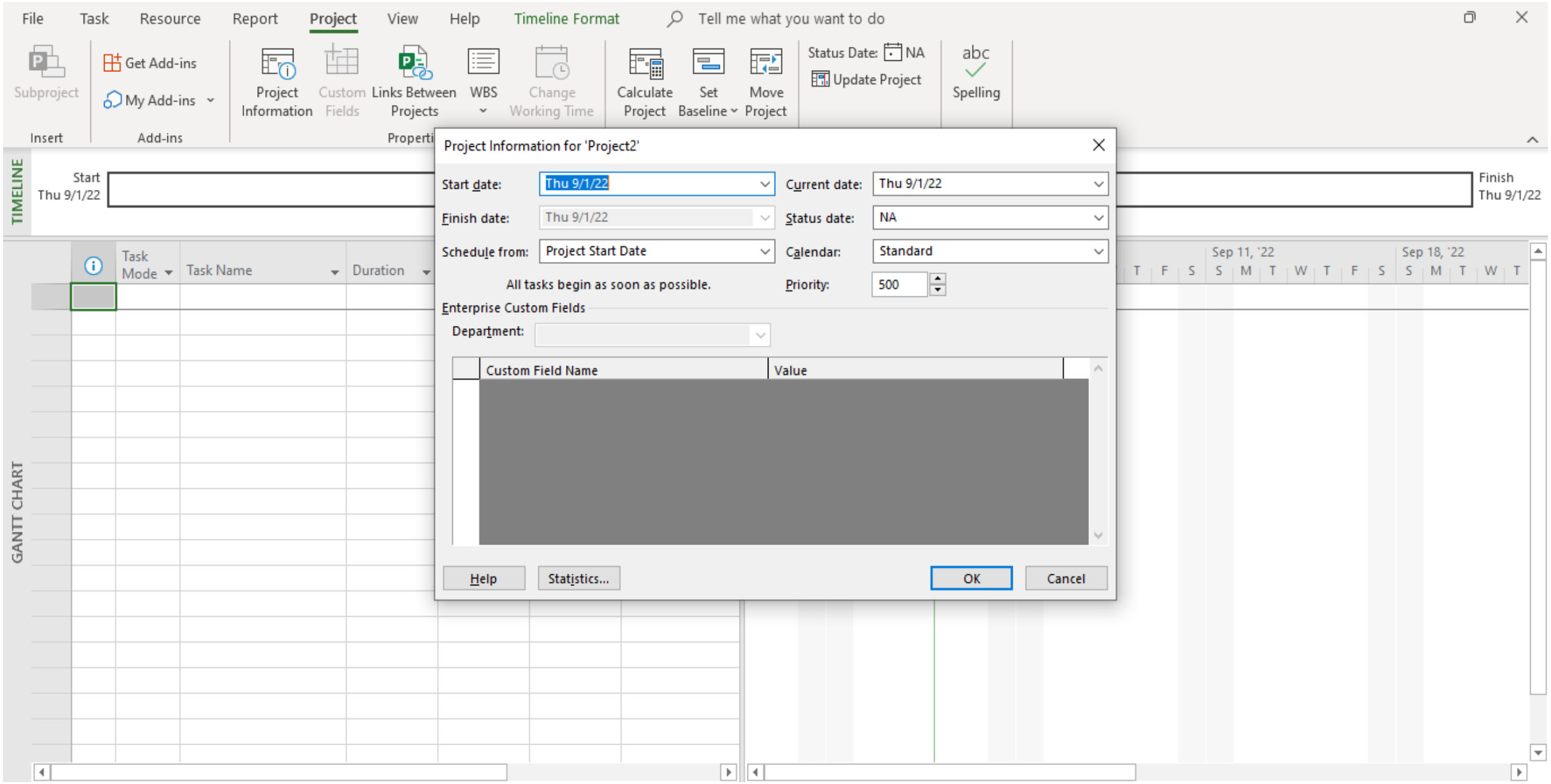


# Project Management

- Project management is the process of planning, organizing, and managing tasks and resources to accomplish a defined objective.
- These objectives are met with constraints such as resources, time and cost.
- Projects share common activities, including breaking the project into easily manageable tasks, scheduling the tasks, communicating with the team, and tracking the tasks as work progresses.

# How to Create a New Project ?

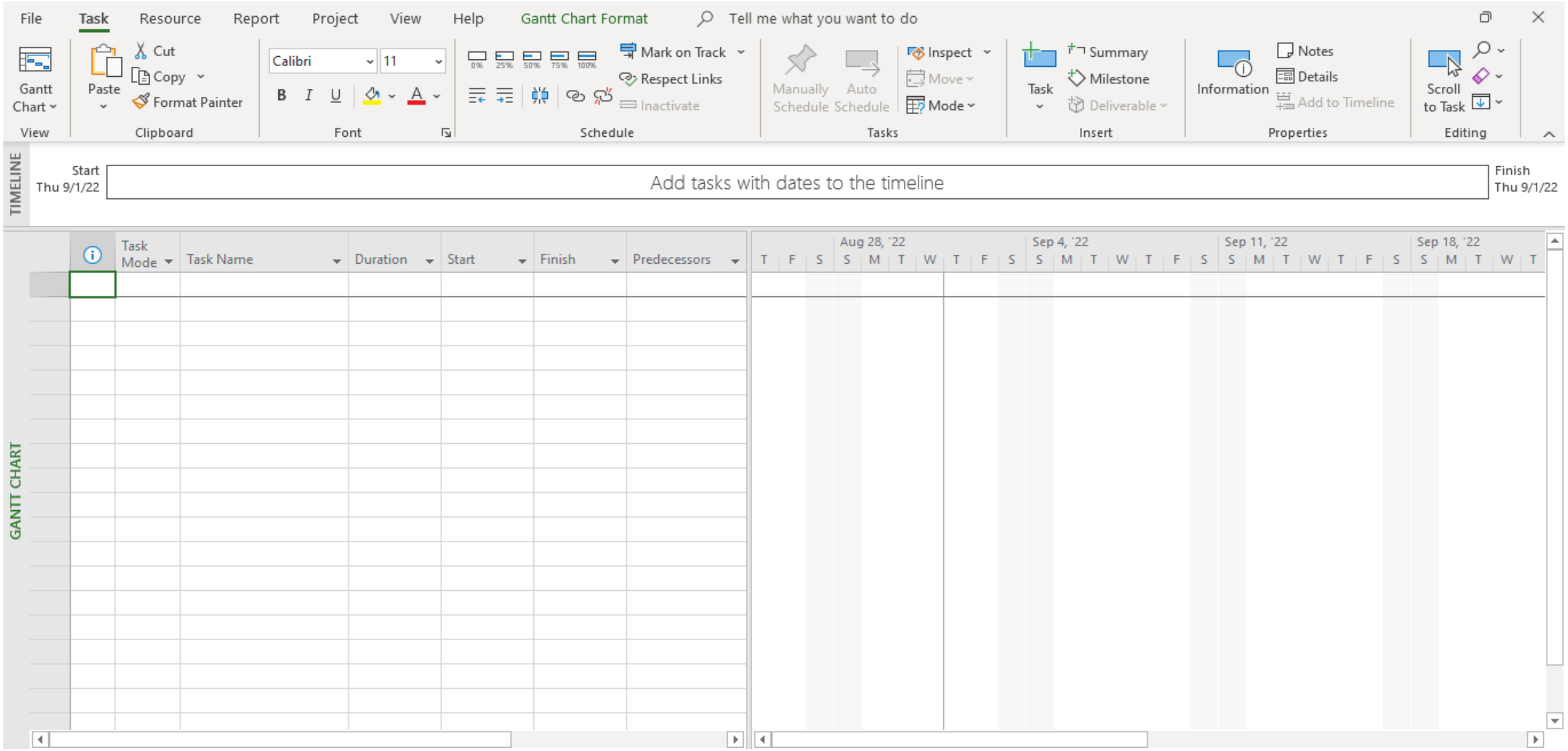
- Steps to create a project:
- Go to file, select new, click “Blank Project”.
- Enter your project's start or finish date, **but not both.**
- It's recommended that you enter only your project's start date and let Microsoft Project calculate the finish date after you have entered and scheduled tasks.


File
Task
Resource
Report
Project
View
Help
Timeline Format
Tell me what you want to do
Subproject
Get Add-ins
My Add-ins
Insert
Add-ins
Project Information
Custom Fields
Links Between Projects
WBS
Change Working Time
Calculate Project
Set Baseline
Move Project
Status Date: NA
Update Project
Spelling
TIMELINE
Start
Thu 9/1/22
Finish
Thu 9/1/22
GANTT CHART
Task Mode
Task Name
Duration
Sep 11, '22
Sep 18, '22
Project Information for 'Project2'
Start date:
Thu 9/1/22
Current date:
Thu 9/1/22
Finish date:
Thu 9/1/22
Status date:
NA
Schedule from:
Project Start Date
Calendar:
Standard
All tasks begin as soon as possible.
Priority:
500
Enterprise Custom Fields
Department:
Custom Field Name
Value
Help
Statistics...
OK
Cancel

# Project View

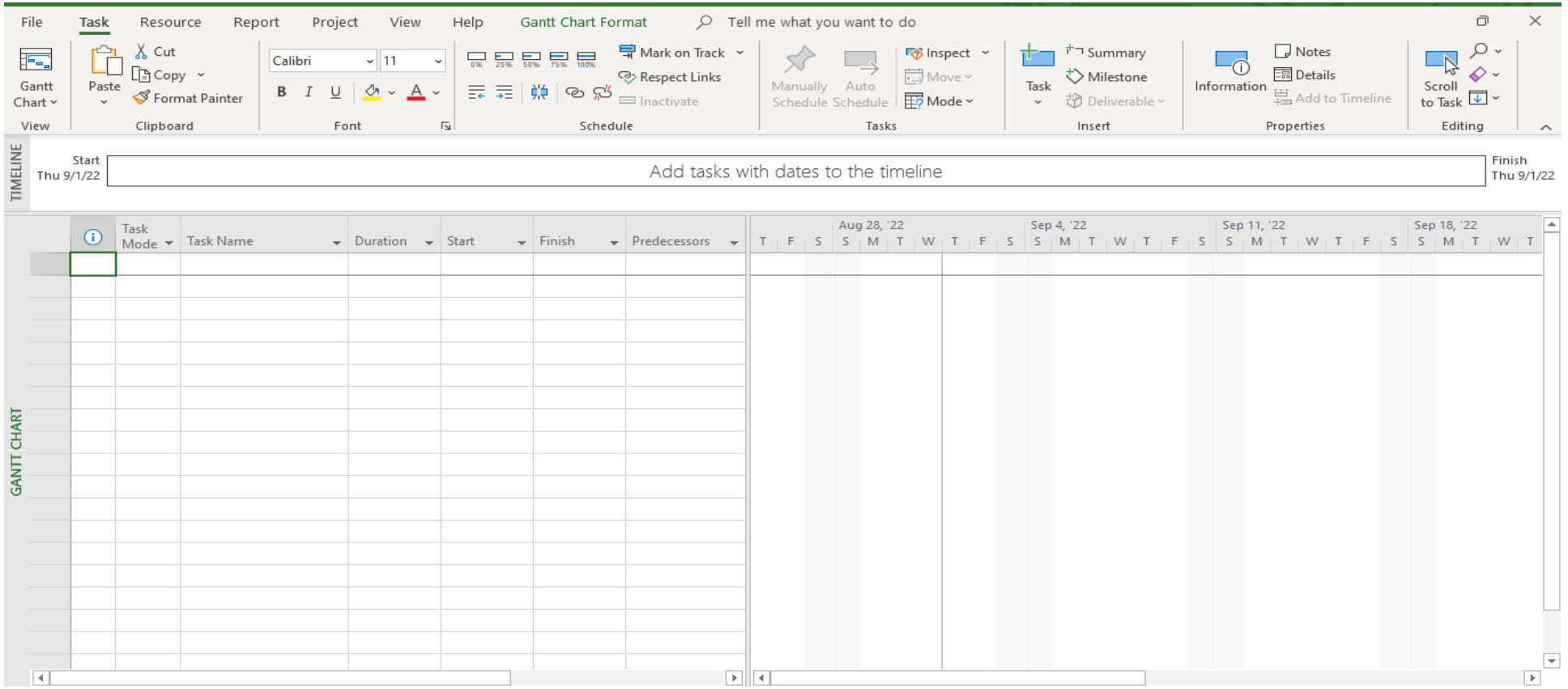
- Views allow you to examine your project from different angles based on what information you want displayed at any given time.
- Project Views are categorized into two types:
    - Task Views
    - Resource Views

# Project View



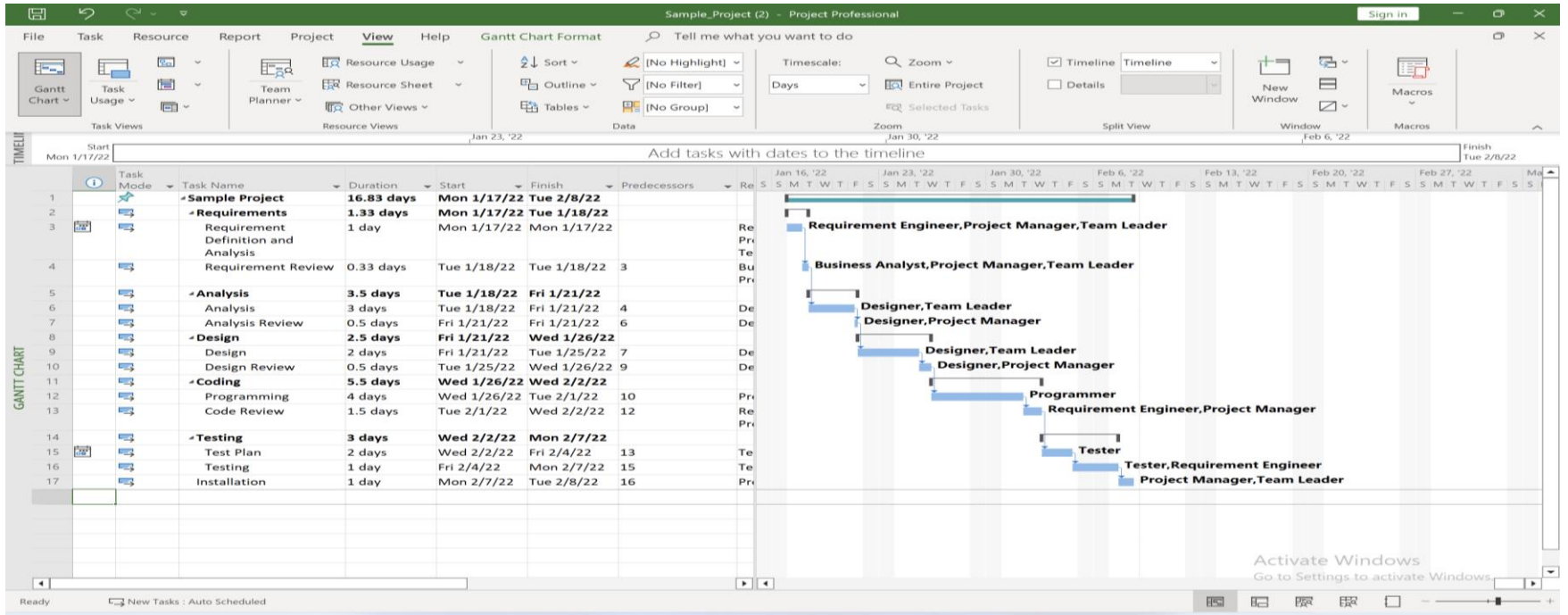
# Gantt Chart

- Select Gantt Chart view from the view menu (default view).
- You'll have a spreadsheet where you can now enter information of all the activities i.e., task name, duration, start date, end date, predecessors and various other fields.



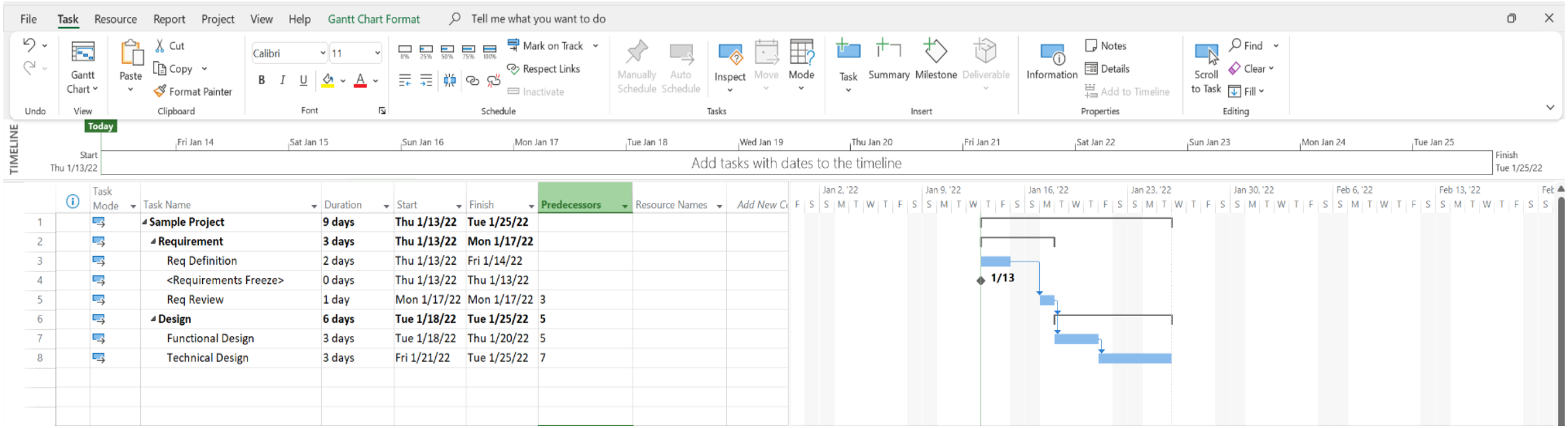
# Gantt Chart

- If you want to specify the time dependence of a task, you may specify the predecessor of a task by clicking tab "*Predecessors*".
- For predecessor activity you need to write the corresponding activity number.
- The software would calculate start and end date based on the fed information.



**Entering Milestones**

- To enter a milestone, enter the task name and set its duration to zero.
- The tool represents it as a diamond shape instead of a bar in the Gantt Chart.

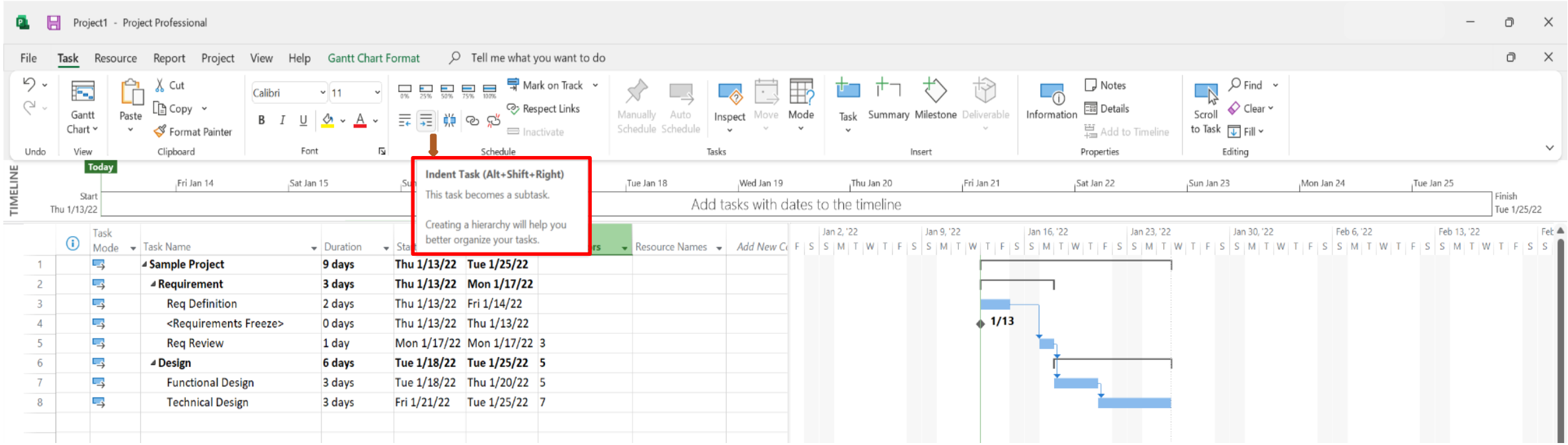


## Organize Tasks into Phases

- Outlining helps organize your tasks into more manageable chunks
- You can indent related tasks under a more general task, creating a hierarchy
- The general tasks are called summary tasks; the indented tasks below the summary task are called subtasks
- A summary task's start and finish dates are determined by the start and finish dates of its earliest and latest subtasks

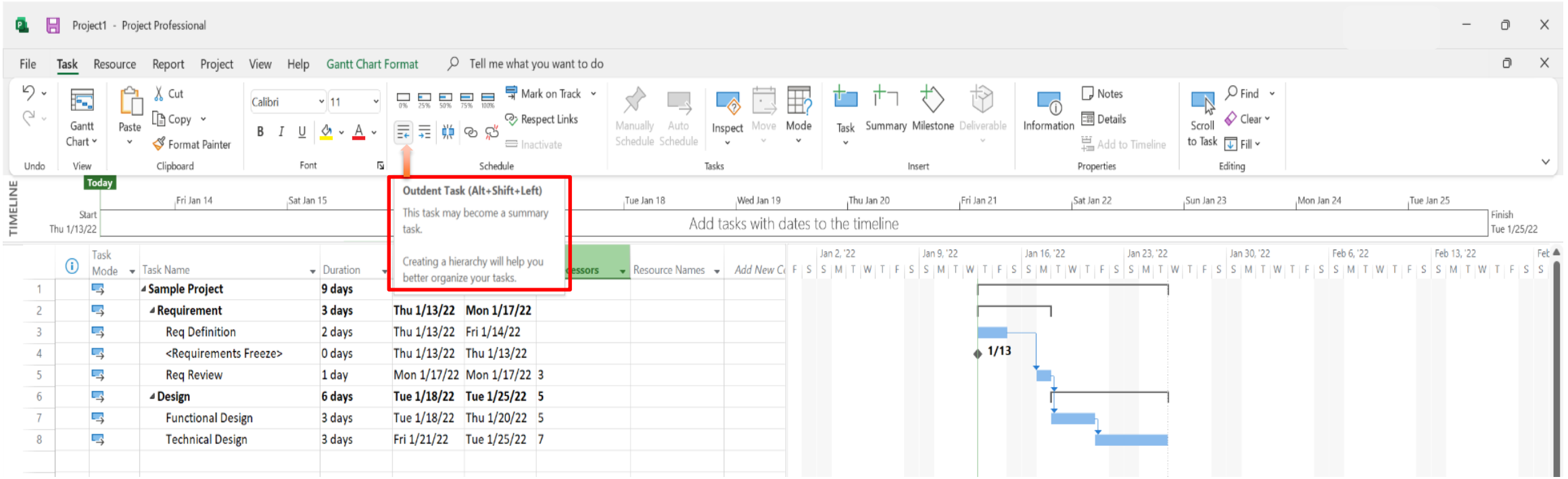
# Organize task into phases

- Create a summary task as normal task first.
- Click "*Indent Task*" icon in the menu.
- Repeat previous step to input all subtasks.



# Organize task into phases

- If you want to set some subtask as normal task, just place the cursor on the subtask, then click the icon labeled as "*Outdent Task*". This subtask then will be outdent to a higher level



# Creation of Links between Tasks

- Tasks are usually scheduled to start as soon as possible
- The duration of any task can be seen in the form of gray bars of varying length on the Gantt Chart in the timeline section
- A task that needs to be completed before are called predecessor task and the linked tasks are its successors
- By linking tasks, Project adjusts the schedule whenever there are changes that affect duration of other tasks
- Tasks can be linked in four ways:

  **start to start, start to finish, finish to start, finish to finish**

# Task Dependency

- Finish to start (FS)
  - -A FS B = B doesn't start before A is finished
- Finish to finish (FF)
  - –A FF B = B doesn't finish before A is finished
- Start to start (SS)
  - –A SS B = B doesn't start before A starts
- Start to finish (SF)
  - –A SF B = B doesn't finish before A starts

# Creation of links between the tasks – Using Predecessors

- A network of tasks in a project must be connecting activities from the start to the end
- To establish these relationship, we need to use the field “Predecessors” of each task, where we can designate which activity will be preceding the one, we are updating
- In this example below, it is indicated that “**Requirement Review**” can start once “**Requirement Definition**” is completed (**Finish to Start** relationship)

TIMELINE

Today

Fri Jan 14 | Sat Jan 15 | Sun Jan 16 | Mon Jan 17 | Tue Jan 18 | Wed Jan 19 | Thu Jan 20 | Fri Jan 21 | Sat Jan 22 | Sun Jan 23 | Mon Jan 24 | Tue Jan 25

Start Thu 1/13/22 — Add tasks with dates to the timeline — Finish Tue 1/25/22

| | Task Mode | Task Name | Duration | Start | Finish | Predecessors | Resource Names | Add New C |
|---|---|---|---|---|---|---|---|---|
| 1 | | **Sample Project** | **9 days** | **Thu 1/13/22** | **Tue 1/25/22** | | | |
| 2 | | **Requirement** | **3 days** | **Thu 1/13/22** | **Mon 1/17/22** | | | |
| 3 | | Req Definition | 2 days | Thu 1/13/22 | Fri 1/14/22 | | | |
| 4 | | <Requirements Freeze> | 0 days | Thu 1/13/22 | Thu 1/13/22 | | | |
| 5 | | Req Review | 1 day | Mon 1/17/22 | Mon 1/17/22 | | | |
| 6 | | **Design** | **6 days** | **Tue 1/18/22** | **Tue 1/25/22** | | | |
| 7 | | Functional Design | 3 days | Tue 1/18/22 | Thu 1/20/22 | | | |
| 8 | | Technical Design | 3 days | Fri 1/21/22 | Tue 1/25/22 | | | |

Jan 2, '22 | Jan 9, '22 | Jan 16, '22 | Jan 23, '22 | Jan 30, '22 | Feb 6, '22 | Feb 13, '22

F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S

Task Information

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: Functional Design

Duration: 3 days — Estimated

Percent complete: 0%

Priority: 500

Schedule Mode: Manually Scheduled / Auto Scheduled

Inactive

Dates

Start: Tue 1/18/22

Finish: Thu 1/20/22

Display on Timeline

Hide Bar

Rollup

Help — OK — Cancel

GANTT CHART

# Assigning Resources to Tasks

- Once you determine that you need to include resources into your project you will need to answer the following questions:
  - –What kind of resources do you need?
  - –How many of each resource do you need?
  - –Where will you get these resources?
  - –How do you determine what your project is going to cost?

# Resource Types

- Resources are of two types: Work resources and material resources

  –**Work** resources complete tasks by expending time on them; they are usually people and equipment that have been assigned to work on the project

  –**Material** resources are supplies and stocks that are needed to complete a project

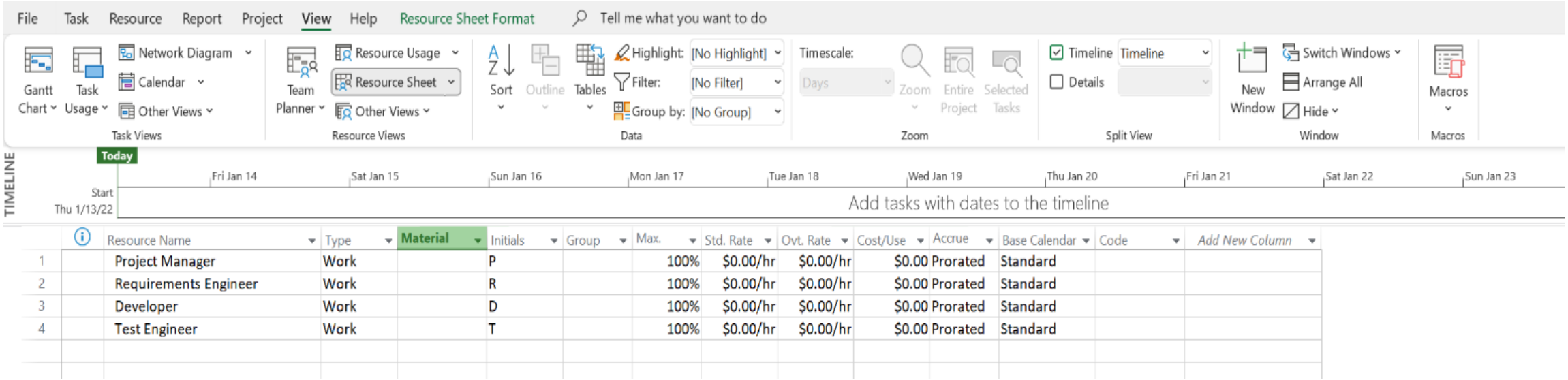
- When a set of resources is available for working, they are listed with details in the resource pool. After you determine the number of resources that you need, you need to establish the time and availability of each resource.
- For work resources, the amount of time that they can work for, be it in hours, days or months, or years and the amount (units of measurement) of material resources need to be specifically defined.

# Assigning Resources to Tasks

- The next step is to assign these resources to their respective tasks
- When you allocate a resource's time to work on a task you are assigning resources
- Once this is done, Project can recalculate the schedule to accommodate the working times of the assigned resources
- It goes one step ahead and tells you when you have **over allocated** a resource, i.e., when you have assigned a resource to multiple tasks in the same time period or when a resource is assigned to do more work than it can complete in a certain time

# Steps to Enter Resource Information in Project

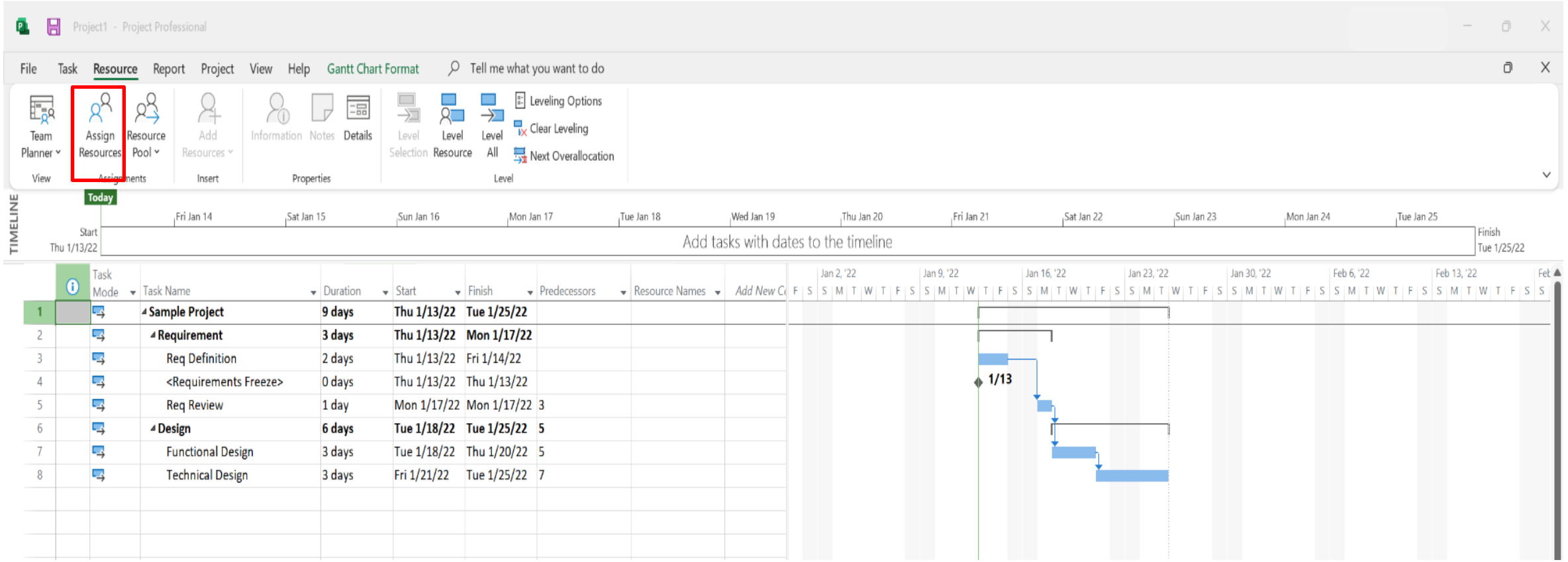
- On the View menu, click Resource Sheet
- In the Resource Name field, type a resource name
- You can enter different information like resource name, type of work, initials, std Rate, etc.
- Below is an example of some Human resources added to the Resource Sheet (We could also add other material resources)



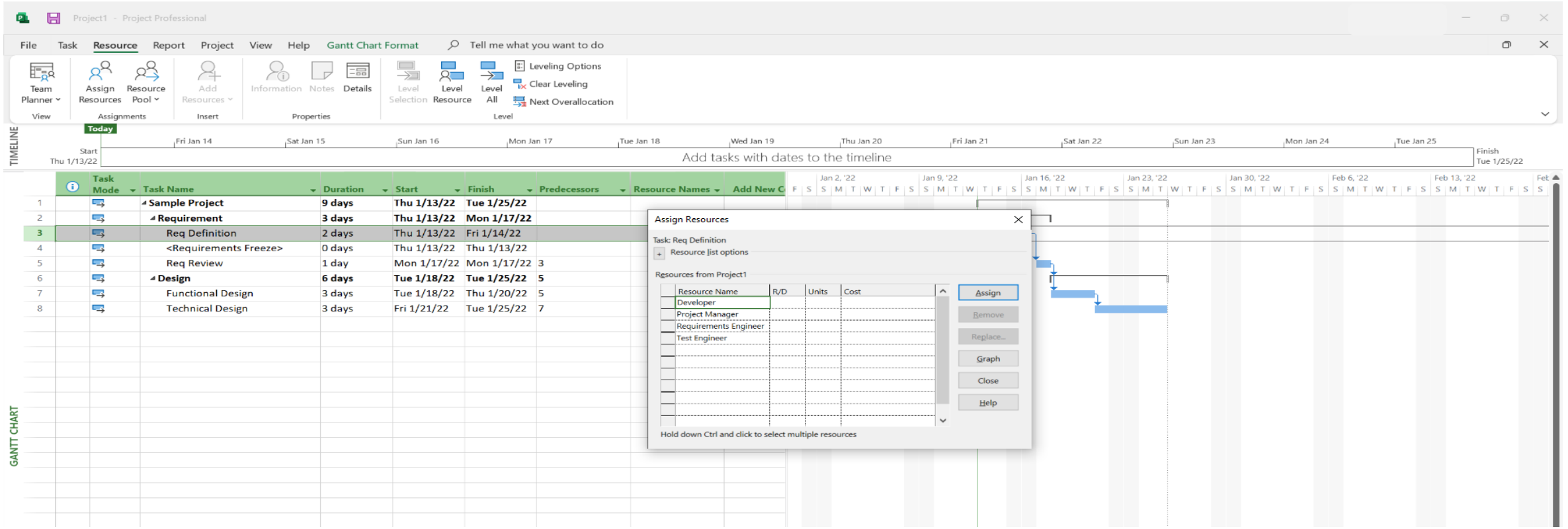

| | Resource Name | Type | Material | Initials | Group | Max. | Std. Rate | Ovt. Rate | Cost/Use | Accrue | Base Calendar | Code | Add New Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Project Manager | Work | | P | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Standard | | |
| 2 | Requirements Engineer | Work | | R | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Standard | | |
| 3 | Developer | Work | | D | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Standard | | |
| 4 | Test Engineer | Work | | T | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Standard | | |

**Steps to Enter Resource Information in Project**

- Once the resources are created, you can assign the resource to tasks
- Go back to task sheet, click the “Resource” menu tab, then click “Assign Resources”



- Then the “Assign resources” window will appear
- Click the resource in the window, and then click the task in the spreadsheet
- Then click “Assign” so that the resource is assigned to the task



## Critical Path

- The critical path is the series of tasks (or even a single task) that dictates the calculated finish date of the project, i.e., when the last task in the critical path is completed, the project is completed
- When you first create a task, its early start and early finish dates are the same as the scheduled start and finish dates
- As you link the task to predecessor and successor tasks and apply any date constraints, the early start and early finish dates are calculated as the earliest possible dates this task could start and finish if all predecessors and successors also start and finish on their respective early start and early finish dates

# Critical Path

- For finding Critical Path, list all the activities and enter early start, late start, early finish and late finish information of all the activities
- You can do this by right click, select "*Insert Column*", then select "*Early Start (ES)*", "*Early Finish (EF)*", "*Late Start (LS)*", "*Late Finish (LF)*", respectively
- Project automatically calculates the actual ES, EF, LS and LF info based on the starting/ ending dates you have provided

Project1 - Project Professional

File Task Resource Report Project View Help Gantt Chart Format Tell me what you want to do

Team Planner | Assign Resources | Resource Pool | Add Resources | Information | Notes | Details | Level Selection | Level Resource | Level All | Leveling Options | Clear Leveling | Next Overallocation

View | Assignments | Insert | Properties | Level

TIMELINE

Today

Fri Jan 14 | Sat Jan 15 | Sun Jan 16 | Mon Jan 17 | Tue Jan 18 | Wed Jan 19 | Thu Jan 20 | Fri Jan 21 | Sat Jan 22 | Sun Jan 23 | Mon Jan 24 | Tue Jan 25

Start Thu 1/13/22 — Add tasks with dates to the timeline — Finish Tue 1/25/22

GANTT CHART

| | Task Mode | Task Name | Duration | Start | Finish | Predecessors | Resource Names |
|---|---|---|---|---|---|---|---|
| 1 | | **Sample Project** | **9 days** | **Thu 1/13/22** | **Tue 1/25/22** | | |
| 2 | | **Requirement** | **3 days** | **Thu 1/13/22** | **Mon 1/17/22** | | |
| 3 | | Req Definition | 2 days | Thu 1/13/22 | Fri 1/14/22 | | |
| 4 | | <Requirements Freeze> | 0 days | Thu 1/13/22 | Thu 1/13/22 | | |
| 5 | | Req Review | 1 day | Mon 1/17/22 | Mon 1/17/22 | 3 | |
| 6 | | **Design** | **6 days** | **Tue 1/18/22** | **Tue 1/25/22** | **5** | |
| 7 | | Functional Design | 3 days | Tue 1/18/22 | Thu 1/20/22 | 5 | |
| 8 | | Technical Design | 3 days | Fri 1/21/22 | Tue 1/25/22 | 7 | |

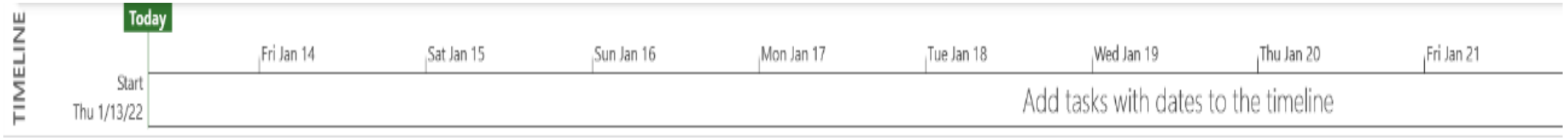
Duration2
Duration3
Duration4
Duration5
Duration6
Duration7
Duration8
Duration9
EAC
Early Finish
Early Start
Earned Value Method
Effort Driven
Error Message
Estimated
External Task
Finish
Finish Slack
Finish Variance
Finish1
Finish10
Finish2
Finish3
Finish4
Finish5
Finish6
Finish7
Finish8
Finish9
Fixed Cost
Fixed Cost Accrual
Flag1
Flag10
Flag11
Flag12
Flag13
Flag14
Flag15
Flag16
Flag17
Flag18
Flag19

Jan 2, '22 | Jan 9, '22 | Jan 16, '22 | Jan 23, '22 | Jan 30, '22 | Feb 6, '22

S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S

1/13

- The screen shot below shows the ES, EF, LS, LF dates included in the project




| | Task Mode | Task Name | Duration | Start | Finish | Predecessor | Early Start | Early Finish | Late Start | Late Finish |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | **Sample Project** | **9 days** | **Thu 1/13/22** | **Tue 1/25/22** | | **Thu 1/13/22** | **Tue 1/25/22** | **Thu 1/13/22** | **Tue 1/25/22** |
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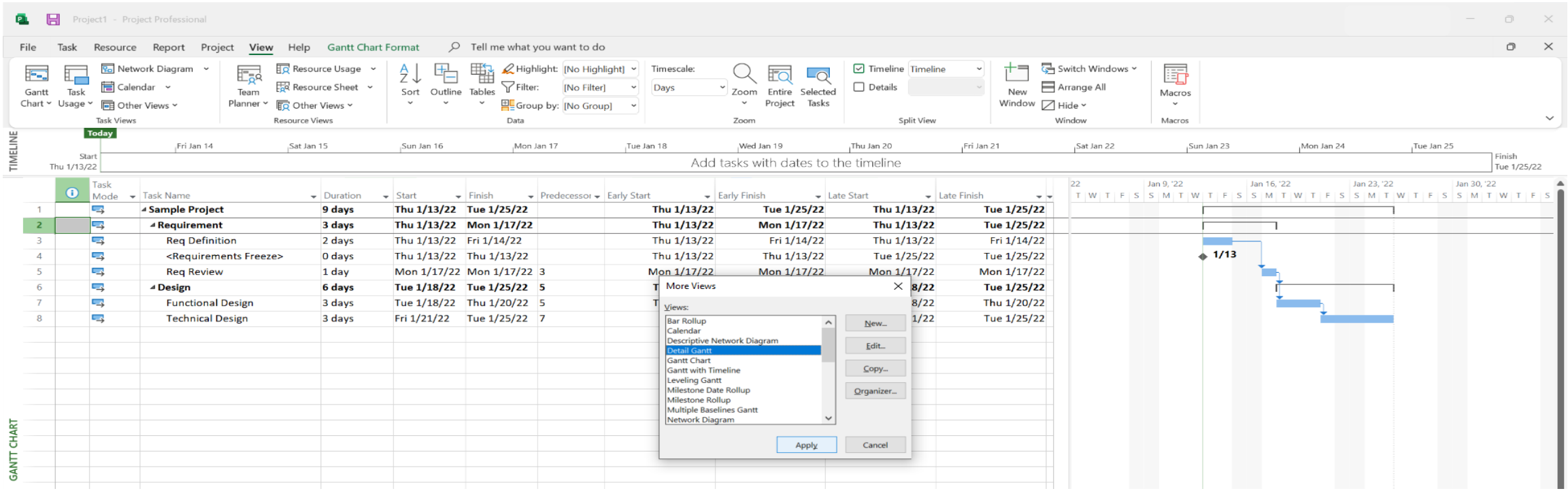
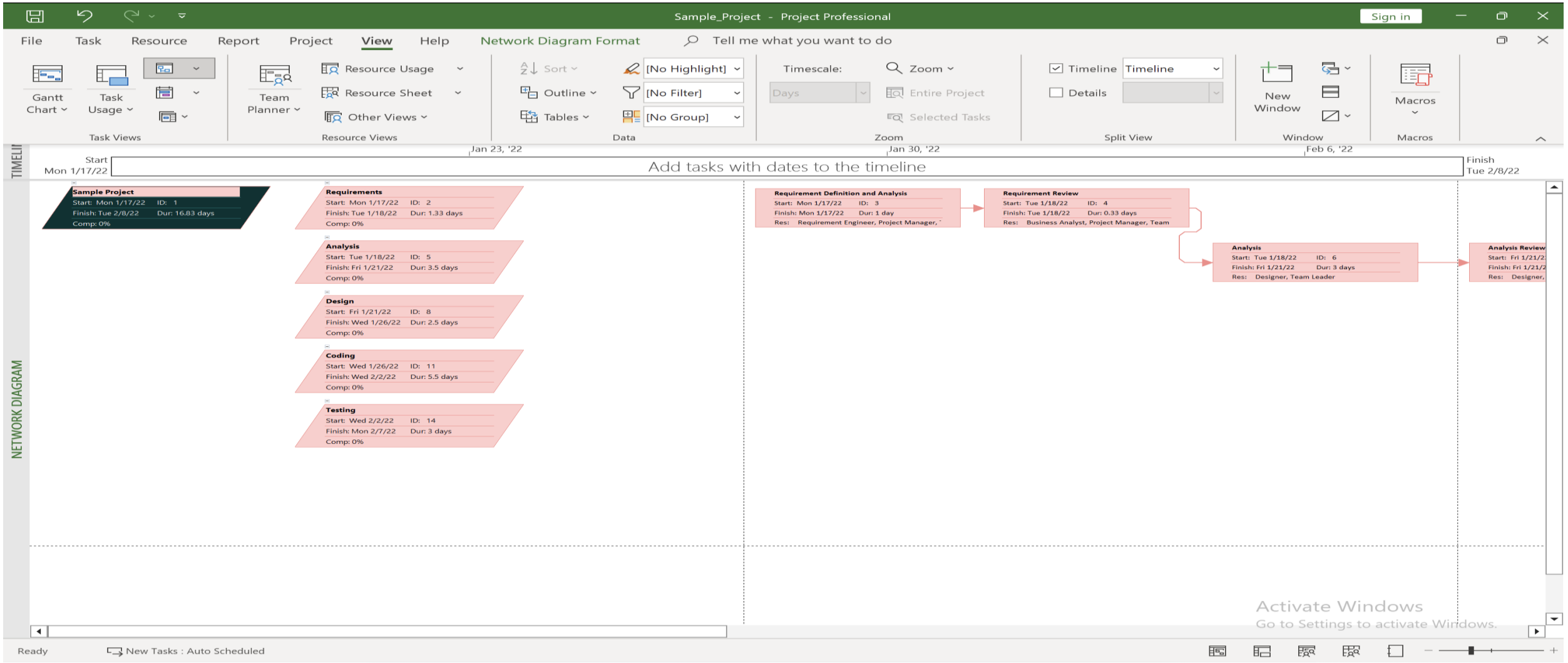
| 4 | | <Requirements Freeze> | 0 days | Thu 1/13/22 | Thu 1/13/22 | | Thu 1/13/22 | Thu 1/13/22 | Tue 1/25/22 | Tue 1/25/22 |
| 5 | | Req Review | 1 day | Mon 1/17/22 | Mon 1/17/22 | 3 | Mon 1/17/22 | Mon 1/17/22 | Mon 1/17/22 | Mon 1/17/22 |
| 6 | | **Design** | **6 days** | **Tue 1/18/22** | **Tue 1/25/22** | **5** | **Tue 1/18/22** | **Tue 1/25/22** | **Tue 1/18/22** | **Tue 1/25/22** |
| 7 | | Functional Design | 3 days | Tue 1/18/22 | Thu 1/20/22 | 5 | Tue 1/18/22 | Thu 1/20/22 | Tue 1/18/22 | Thu 1/20/22 |
| 8 | | Technical Design | 3 days | Fri 1/21/22 | Tue 1/25/22 | 7 | Fri 1/21/22 | Tue 1/25/22 | Fri 1/21/22 | Tue 1/25/22 |

- Critical path can be seen in multiple ways
- We can show critical path using Gantt chart, Detailed chart, Network Diagram, etc.
- In Detailed Gantt click on Gantt Chart ➡ Detailed and it will show the critical path with slack time



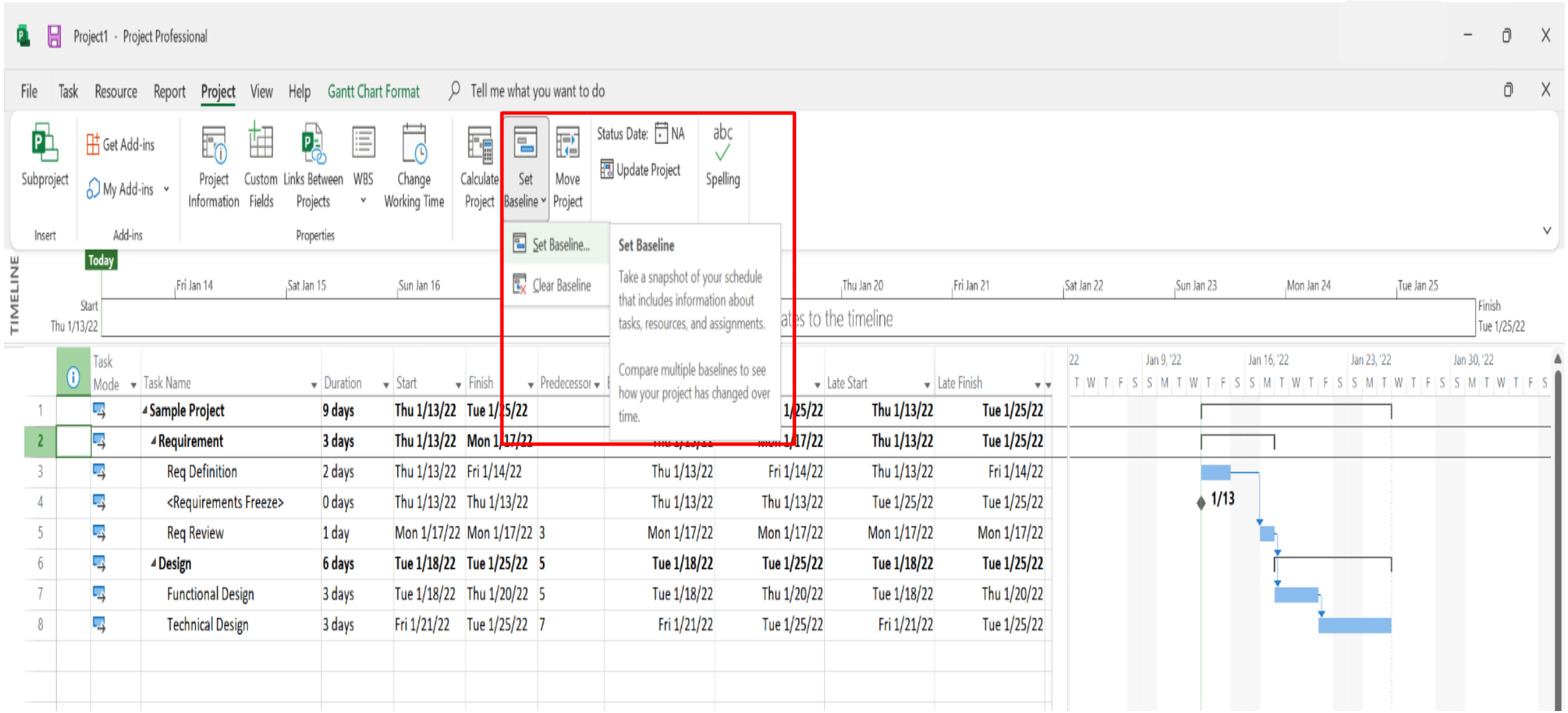
- In Network Diagram click on Network Diagram



## **Baseline**:

- A baseline is the set of original and finish dates, durations, work, and cost estimates that you save after you've completed and fine-tuned your project plan but before the project begins
- Typically, you set a baseline when your plan is complete, and you are ready to start tracking progress on it
- Baseline could be set from Project Menu Tab➡ Set Baseline
- By comparing baseline and scheduled information, you can track task start and finish dates
  - From the View menu ➡ Tables ➡ click Variance
  - To view variance information graphically, use the Tracking Gantt view
  - From the View menu ➡ Other Views ➡ More Views ➡ click Tracking Gantt

# Baseline


Project1 - Project Professional
File Task Resource Report Project View Help Gantt Chart Format
Tell me what you want to do
Subproject
Get Add-ins
My Add-ins
Insert
Add-ins
Project Information
Custom Fields
Links Between Projects
WBS
Change Working Time
Properties
Calculate Project
Set Baseline
Move Project
Status Date: NA
Update Project
abc
Spelling
Set Baseline...
Clear Baseline
Set Baseline
Take a snapshot of your schedule that includes information about tasks, resources, and assignments.
Compare multiple baselines to see how your project has changed over time.
TIMELINE
Today
Fri Jan 14
Sat Jan 15
Sun Jan 16
Thu Jan 20
Fri Jan 21
Sat Jan 22
Sun Jan 23
Mon Jan 24
Tue Jan 25
Start
Thu 1/13/22
Finish
Tue 1/25/22
Task Mode
Task Name
Duration
Start
Finish
Predecessor
Late Start
Late Finish
1 Sample Project 9 days Thu 1/13/22 Tue 1/25/22 Thu 1/13/22 Tue 1/25/22
2 Requirement 3 days Thu 1/13/22 Mon 1/17/22 Thu 1/13/22 Tue 1/25/22
3 Req Definition 2 days Thu 1/13/22 Fri 1/14/22 Thu 1/13/22 Fri 1/14/22 Thu 1/13/22 Fri 1/14/22
4 <Requirements Freeze> 0 days Thu 1/13/22 Thu 1/13/22 Thu 1/13/22 Thu 1/13/22 Tue 1/25/22 Tue 1/25/22
5 Req Review 1 day Mon 1/17/22 Mon 1/17/22 3 Mon 1/17/22 Mon 1/17/22 Mon 1/17/22 Mon 1/17/22
6 Design 6 days Tue 1/18/22 Tue 1/25/22 5 Tue 1/18/22 Tue 1/25/22 Tue 1/18/22 Tue 1/25/22
7 Functional Design 3 days Tue 1/18/22 Thu 1/20/22 5 Tue 1/18/22 Thu 1/20/22 Tue 1/18/22 Thu 1/20/22
8 Technical Design 3 days Fri 1/21/22 Tue 1/25/22 7 Fri 1/21/22 Tue 1/25/22 Fri 1/21/22 Tue 1/25/22
Jan 9, '22
Jan 16, '22
Jan 23, '22
Jan 30, '22
1/13