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Institute: Illinois Institute of Technology

CS 587: Software Project Management

Spring 2024 - Assignment I

- **Questions and Answers:**

Q. 4 What is the earliest finish date for this project if it is scheduled to start on 1/29/24?

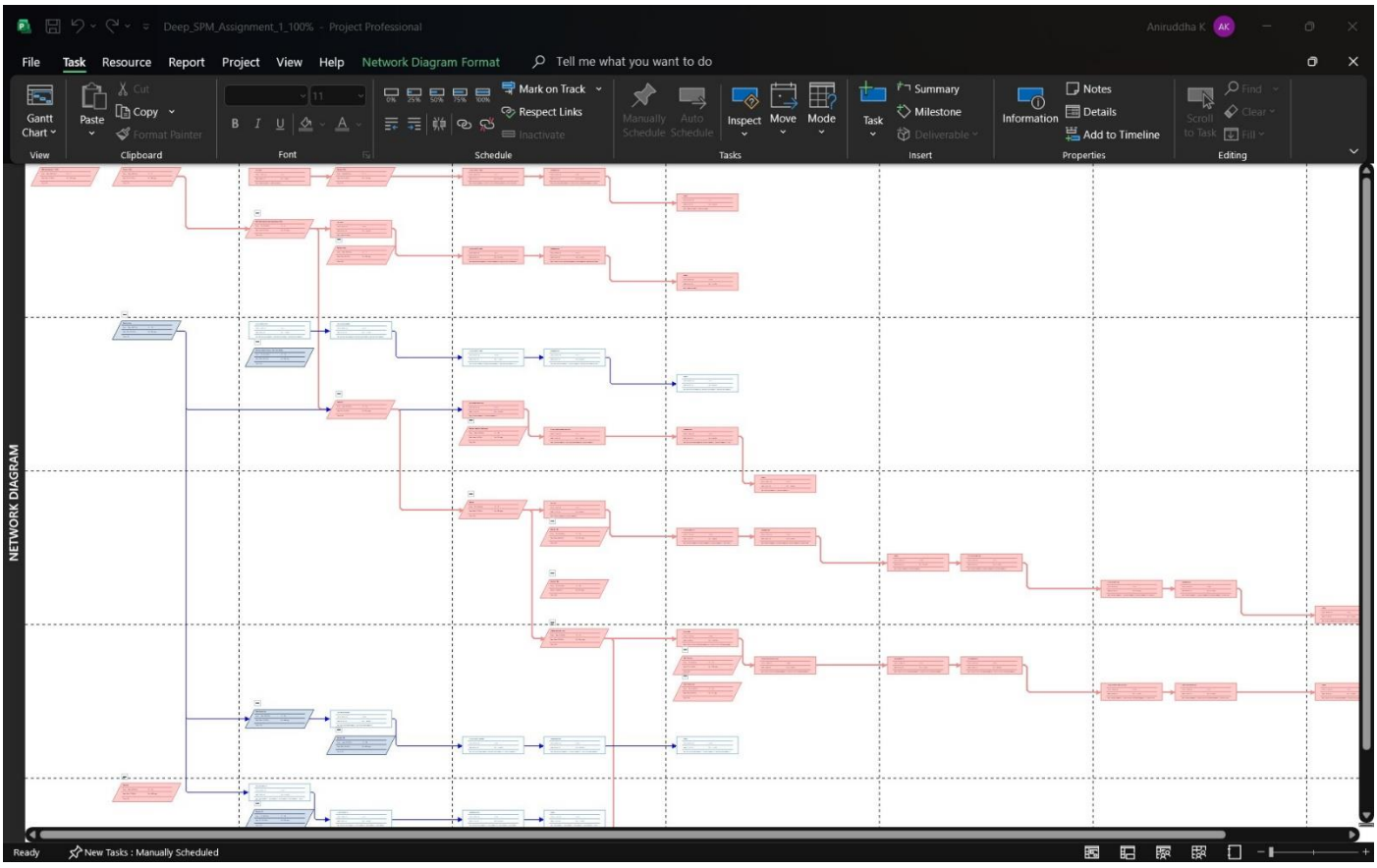
Ans: If the project is scheduled to start on 1/29/24, with 100% resource utilization and allocation then the earliest finish date is 6/17/24. So, the start and finish date are 29 Jan 2024 to 17 June 2024.

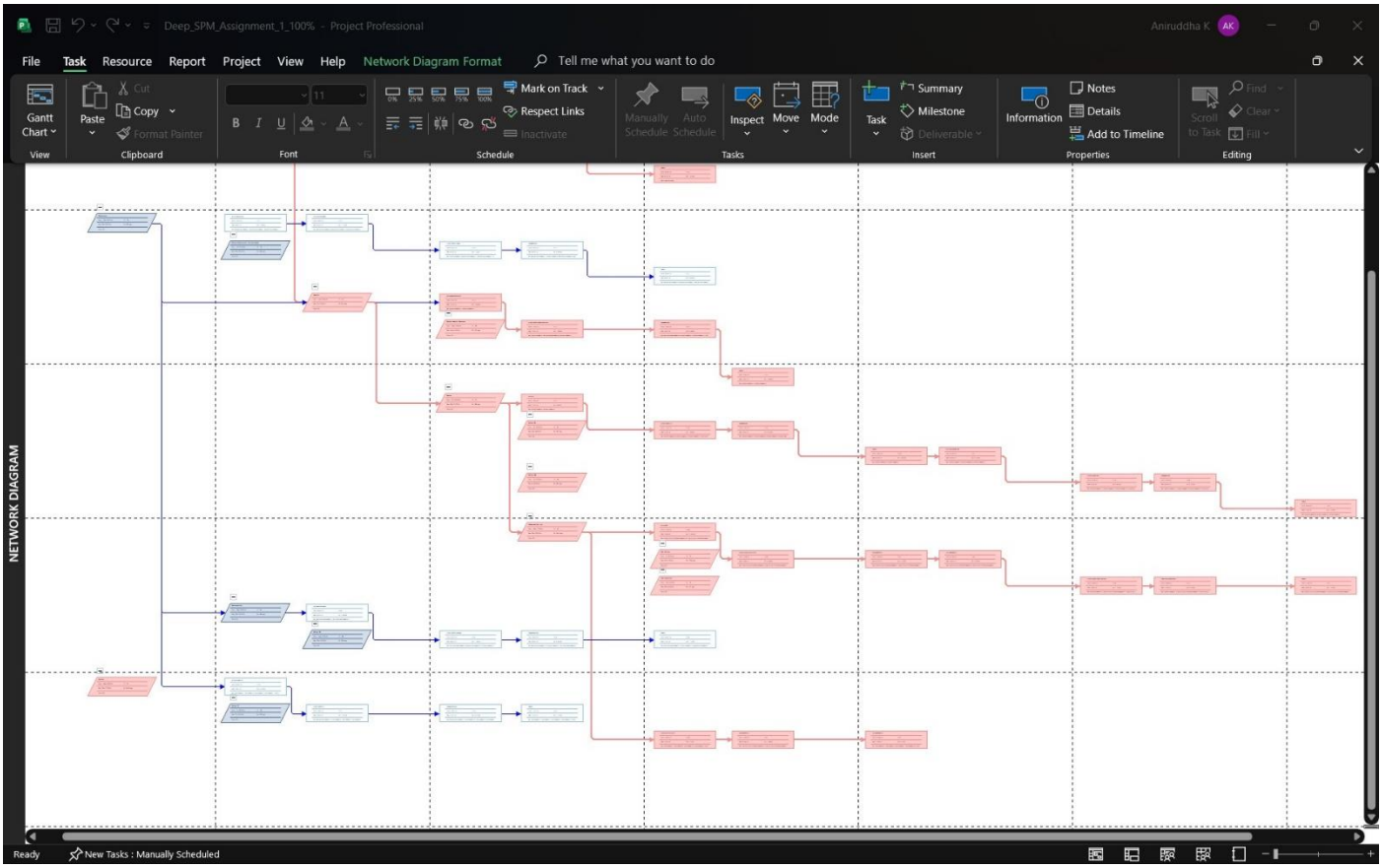
Q. 5 If you are not allowed to use more than 20% of the resources available at any point in time for this project, what is the earliest finish date for this project if it is scheduled to start on 1/29/24?

Ans: If the project is scheduled to start on 1/29/24, with 20% resource utilization and allocation then the earliest finish date is 12/10/25. So, the start and finish date is 29 Jan 2024 to 10 December 2024.

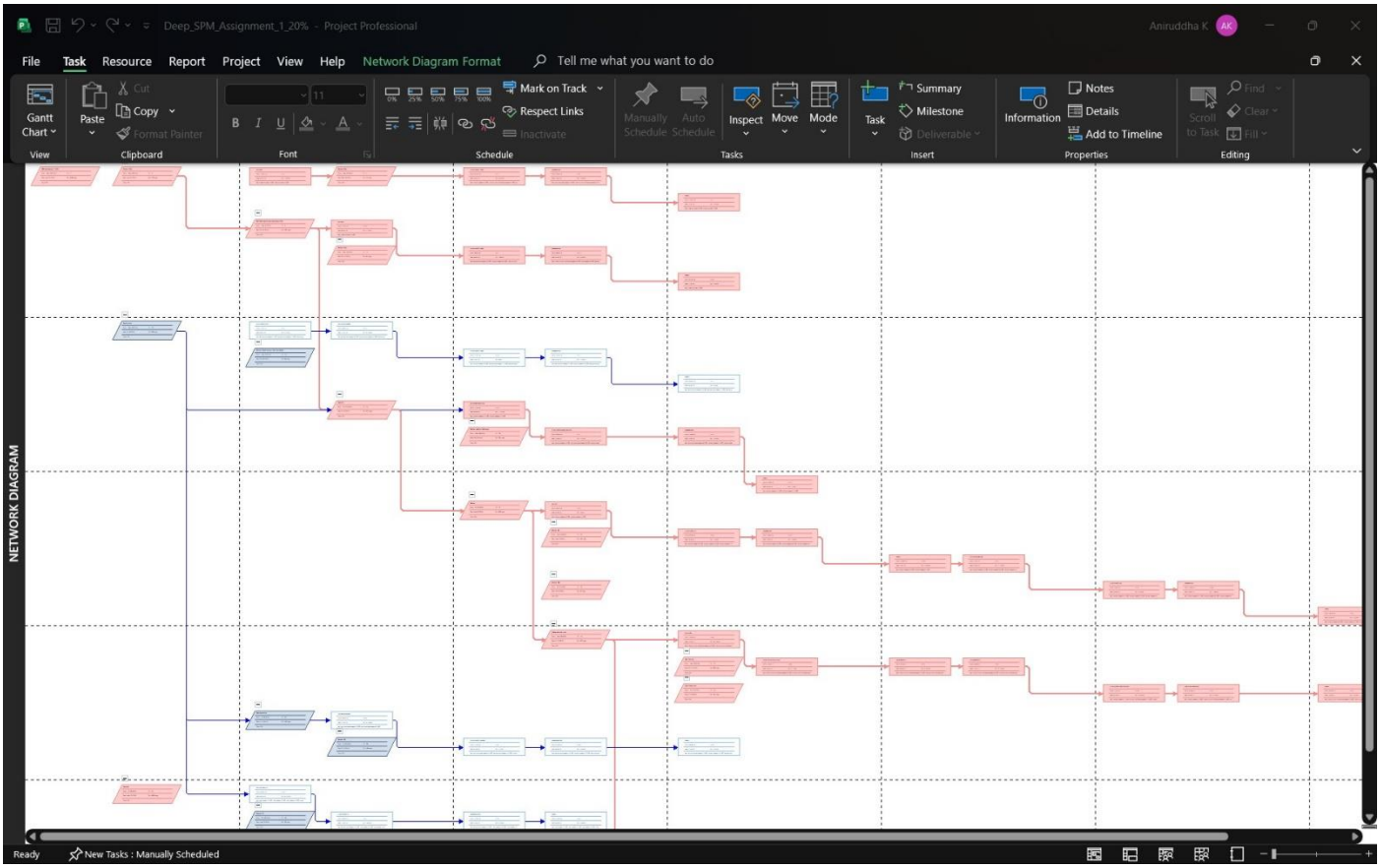
- **Network Diagram:**

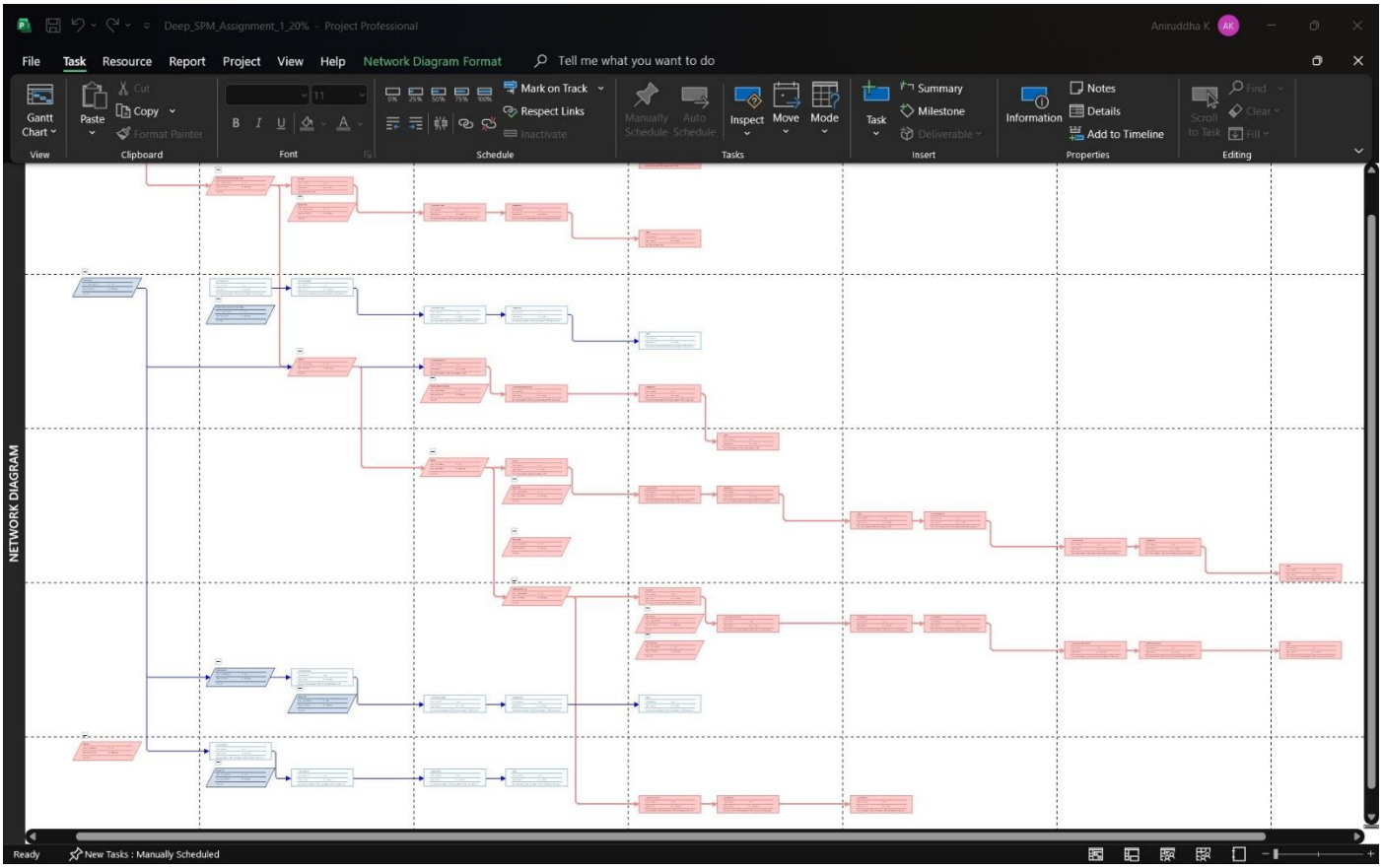
1. 100% utilization:





2. 20% Utilization:





- **Calculation:**

The formula to calculate duration:

$$\text{Number of days} = \frac{(\text{Amount of work} / \text{Productivity Rate})}{8}$$

Here,

8 hours is considered as 1 day as per 9-5 office hours

- **Example Calculation:**

1. **Project Plan - Write plan:**
   - ✓ Amount of work: 51 pages
   - ✓ Productivity rate: 2 pages/hour
   - ✓ Duration = $\frac{51/2}{8}$ = 3.19 days
2. **Risk Mitigation and Contingency Plan – Write Plan**
   - ✓ Amount of work: 65 pages
   - ✓ Productivity rate: 5 pages/hour
   - ✓ Duration = $\frac{65/5}{8}$ = 1.63 days
3. **Requirement – Write Use case Models:**
   - ✓ Amount of work: 167 requests
   - ✓ Productivity rate: 5 requests/hour
   - ✓ Duration = $\frac{167/5}{8}$ = 4.18 days

4. **Analysis –Review Meeting:**
   - ✓ Amount of work: 89 pages
   - ✓ Productivity rate: 3 pages/hour
   - ✓ Duration = $\frac{89/3}{8}$ = 3.71 days
5. **Design – Rework**
   - ✓ Amount of work: 184 pages
   - ✓ Productivity rate: 5 pages/hour
   - ✓ Duration/Effort = $\frac{184/5}{8}$ = 4.6 days
6. **Coding and Unit Test - Prep for code inspection**
   - ✓ Amount of work: 5123 SLOC
   - ✓ Productivity rate: 5 SLOC/hour
   - ✓ Duration/Effort = $\frac{5123/5}{8}$ = 128.08 days
7. **Testing – Execute TP (test cases):**
   - ✓ Amount of work: 231 pages
   - ✓ Productivity rate: 5 pages/day
   - ✓ Duration/Effort = $\frac{231/5}{8}$ = 46.2 days
8. **Documentation - Review UD Meeting:**
   - ✓ Amount of work: 146 pages
   - ✓ Productivity rate: 4 pages/hour
   - ✓ Duration/Effort = $\frac{146/4}{8}$ = 4.56 days

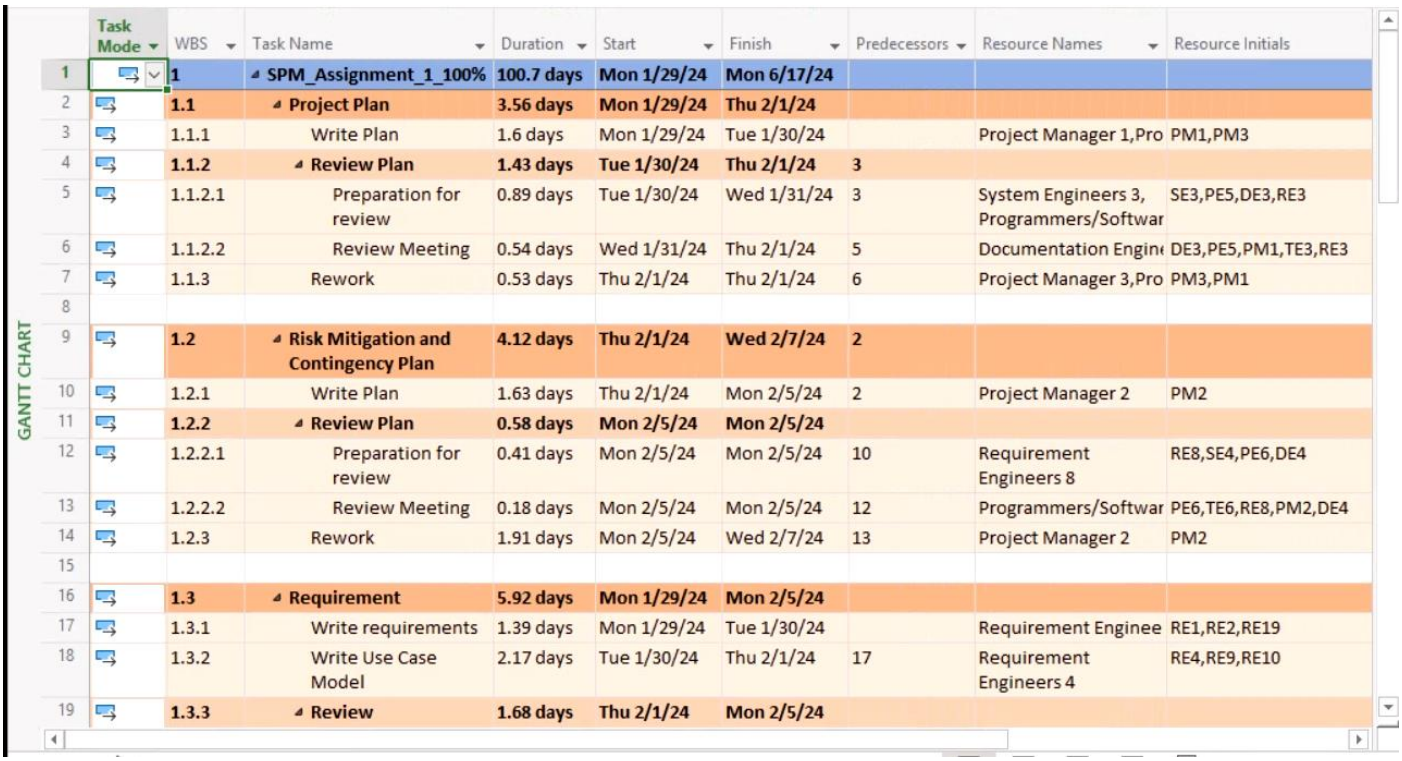
- **Below is the rest of the calculation of each remaining Task:**

Task	Amount of Work	Productivity Rate	Calculated Duration (in days)
Project Plan			
Write Plan	51 pages	2 pages/Hour	3.19
Review Plan			
Preparation for review		4 pages/Hour	1.59
Review Meeting		5 pages/Hour	1.28
Rework	32 defects	5 defects/Hour	0.8
Risk Mitigation and Contingency Plan			
Write Plan	65 pages	5 pages/Hour	1.63
Review Plan			
Preparation for review		5 pages/Hour	1.63
Review Meeting		10 pages/Hour	0.81
Rework	61 defects	4 defects/Hour	1.91
Requirement			
Write requirements	167 Req	5 Req/Hour	4.18
Write Use Case Model	78 Use Cases	3 use case/2 Hours	6.5
Review Requirements/ Use Case Model			
Preparation for review		18 Req/Hour	1.16
		4 Use Cases/Hour	2.44
Review Meeting		28 Req/Hour	0.75
		6 Use Cases/Hour	1.63
Rework	189 defects	10 defects/Hour	2.36
Analysis			
Write Analysis Document	89 pages	3 pages/Hour	3.71
Review Analysis Document			
Preparation for Analysis Document		4 pages/Hour	2.78
Review Meeting		9 pages/Hour	1.24
Rework	123 defects	5 defects/Hour	3.08
Design			
Write DD	184 pages	5 pages/Hour	4.6
Review DD			
Preparation for DD		4 pages/Hour	5.75
Review Meeting		8 pages/Hour	2.88
Rework	231 defects	4 defects/Hour	7.22
Write Data Model (DM)	34 pages	1 page/4 Hours	17
Review DM			
Preparation for DM		3 pages/Hour	1.42
Review Meeting		5 pages/Hour	0.85
Rework	92 defects	5 defects/Hour	2.3
Coding and unit test			
Write Code	5123 SLOC	5 SLOC/Hour	128.08
Unit Testing			
Prepare/Execute Test Cases	317 test cases	10 Test Cases/Day	31.7
Fix Found Defects	271 Defects	8 Defects/Day	33.88
Test Fixed Defects	271 Defects	12 Defects/Day	22.58
Code Inspection			
Preparation for Code Inspection		100 SLOC/Hour	6.40
Code Inspection Meeting		210 SLOC/Hour	3.05

Rework	195 defects	5 defects/Hour	4.88
Testing			
Write test plan (TP)	231 pages	5 pages/Day	46.2
Review TP			
Preparation for TP		4 pages/Hour	7.29
Review TP Meeting		8 pages/Hour	3.61
Rework	310 defects	7 defects/Hour	5.54
Execute TP (test cases)	345 test cases	14 test cases/day	24.64
Fix Found Defects	248 defects	5 defects/day	49.6
Test Fixed Defects	248 defects	10 defects/day	24.8
Documentation			
User Documentation	146 pages	4 pages/Hour	4.56
Review UD			
Preparation for UD Review		4 pages/Hour	4.56
Review UD Meeting		10 pages/Hour	1.83
Rework	283 defects	6 defects/Hour	5.90

- **Gantt Chart:**

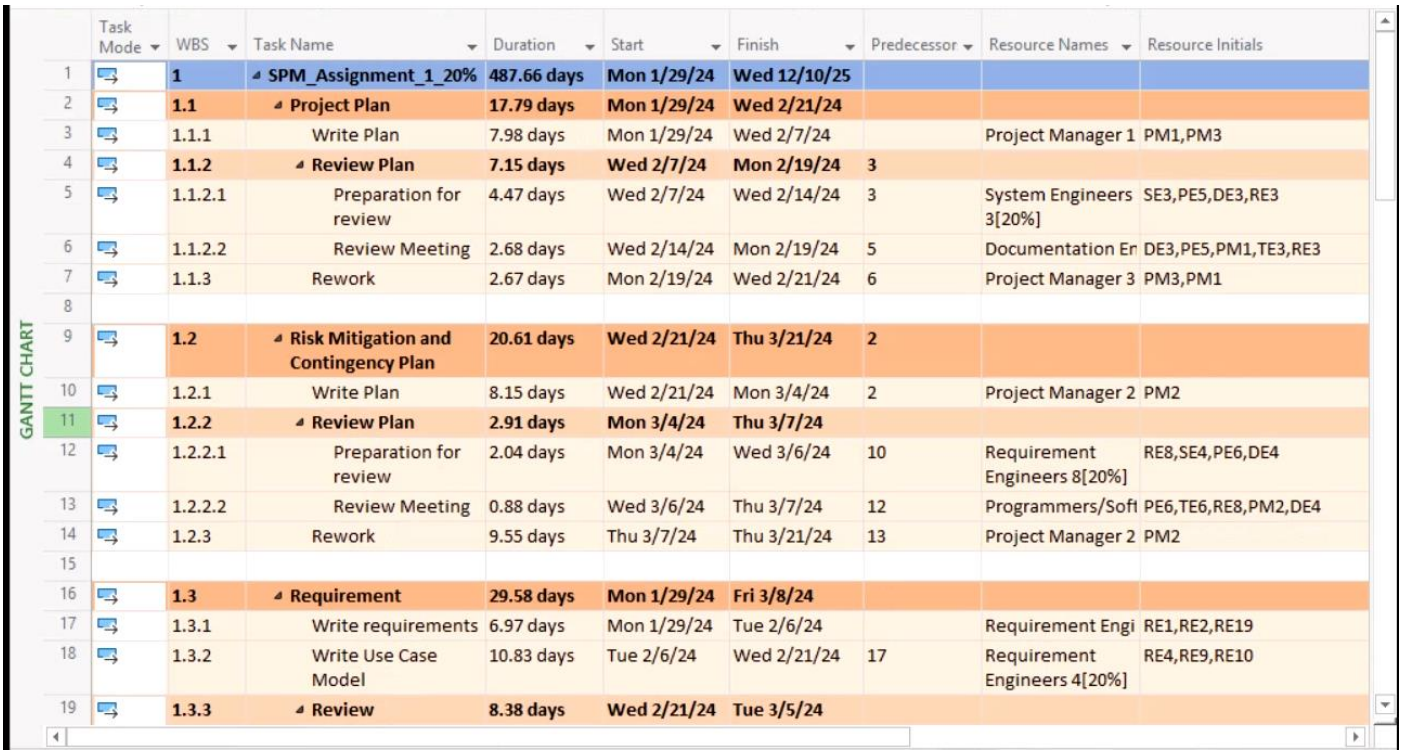
1. 100% Utilization



GANTT CHART

	Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Resource Initials
1		**1**	**SPM_Assignment_1_100%**	**100.7 days**	**Mon 1/29/24**	**Mon 6/17/24**			
2		**1.1**	**Project Plan**	**3.56 days**	**Mon 1/29/24**	**Thu 2/1/24**			
3		1.1.1	Write Plan	1.6 days	Mon 1/29/24	Tue 1/30/24		Project Manager 1,Pro	PM1,PM3
4		**1.1.2**	**Review Plan**	**1.43 days**	**Tue 1/30/24**	**Thu 2/1/24**	**3**		
5		1.1.2.1	Preparation for review	0.89 days	Tue 1/30/24	Wed 1/31/24	3	System Engineers 3, Programmers/Softwar	SE3,PE5,DE3,RE3
6		1.1.2.2	Review Meeting	0.54 days	Wed 1/31/24	Thu 2/1/24	5	Documentation Engin	DE3,PE5,PM1,TE3,RE3
7		1.1.3	Rework	0.53 days	Thu 2/1/24	Thu 2/1/24	6	Project Manager 3,Pro	PM3,PM1
8									
9		**1.2**	**Risk Mitigation and Contingency Plan**	**4.12 days**	**Thu 2/1/24**	**Wed 2/7/24**	**2**		
10		1.2.1	Write Plan	1.63 days	Thu 2/1/24	Mon 2/5/24	2	Project Manager 2	PM2
11		**1.2.2**	**Review Plan**	**0.58 days**	**Mon 2/5/24**	**Mon 2/5/24**			
12		1.2.2.1	Preparation for review	0.41 days	Mon 2/5/24	Mon 2/5/24	10	Requirement Engineers 8	RE8,SE4,PE6,DE4
13		1.2.2.2	Review Meeting	0.18 days	Mon 2/5/24	Mon 2/5/24	12	Programmers/Softwar	PE6,TE6,RE8,PM2,DE4
14		1.2.3	Rework	1.91 days	Mon 2/5/24	Wed 2/7/24	13	Project Manager 2	PM2
15									
16		**1.3**	**Requirement**	**5.92 days**	**Mon 1/29/24**	**Mon 2/5/24**			
17		1.3.1	Write requirements	1.39 days	Mon 1/29/24	Tue 1/30/24		Requirement Enginee	RE1,RE2,RE19
18		1.3.2	Write Use Case Model	2.17 days	Tue 1/30/24	Thu 2/1/24	17	Requirement Engineers 4	RE4,RE9,RE10
19		**1.3.3**	**Review**	**1.68 days**	**Thu 2/1/24**	**Mon 2/5/24**			

2. 20% Utilization



GANTT CHART

	Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessor	Resource Names	Resource Initials
1		**1**	**SPM_Assignment_1_20%**	**487.66 days**	**Mon 1/29/24**	**Wed 12/10/25**			
2		**1.1**	**Project Plan**	**17.79 days**	**Mon 1/29/24**	**Wed 2/21/24**			
3		1.1.1	Write Plan	7.98 days	Mon 1/29/24	Wed 2/7/24		Project Manager 1	PM1,PM3
4		**1.1.2**	**Review Plan**	**7.15 days**	**Wed 2/7/24**	**Mon 2/19/24**	**3**		
5		1.1.2.1	Preparation for review	4.47 days	Wed 2/7/24	Wed 2/14/24	3	System Engineers 3[20%]	SE3,PE5,DE3,RE3
6		1.1.2.2	Review Meeting	2.68 days	Wed 2/14/24	Mon 2/19/24	5	Documentation En	DE3,PE5,PM1,TE3,RE3
7		1.1.3	Rework	2.67 days	Mon 2/19/24	Wed 2/21/24	6	Project Manager 3	PM3,PM1
8									
9		**1.2**	**Risk Mitigation and Contingency Plan**	**20.61 days**	**Wed 2/21/24**	**Thu 3/21/24**	**2**		
10		1.2.1	Write Plan	8.15 days	Wed 2/21/24	Mon 3/4/24	2	Project Manager 2	PM2
11		**1.2.2**	**Review Plan**	**2.91 days**	**Mon 3/4/24**	**Thu 3/7/24**			
12		1.2.2.1	Preparation for review	2.04 days	Mon 3/4/24	Wed 3/6/24	10	Requirement Engineers 8[20%]	RE8,SE4,PE6,DE4
13		1.2.2.2	Review Meeting	0.88 days	Wed 3/6/24	Thu 3/7/24	12	Programmers/Soft	PE6,TE6,RE8,PM2,DE4
14		1.2.3	Rework	9.55 days	Thu 3/7/24	Thu 3/21/24	13	Project Manager 2	PM2
15									
16		**1.3**	**Requirement**	**29.58 days**	**Mon 1/29/24**	**Fri 3/8/24**			
17		1.3.1	Write requirements	6.97 days	Mon 1/29/24	Tue 2/6/24		Requirement Engi	RE1,RE2,RE19
18		1.3.2	Write Use Case Model	10.83 days	Tue 2/6/24	Wed 2/21/24	17	Requirement Engineers 4[20%]	RE4,RE9,RE10
19		**1.3.3**	**Review**	**8.38 days**	**Wed 2/21/24**	**Tue 3/5/24**			