

Software Construction & Development

Section A, Fall 2025

Assignment 1

Due Date: Thursday, September 18, 2025

Project Planning

Consider a Project Planning software that helps to plan and organize tasks along with resource allocation. Following functionality is required:

1. Read a file that contains a list of tasks along with its dependencies (comma separated). Information comprises of task id, title, start time (date+time), end time (date+time), and a list (possibly empty) of ids for the tasks on which it is dependent. Following is an example of the information:

```
1, Initial research and analysis, 20250915+0800, 20251010+1800,  
2, Develop program content and materials, 20251013+0800, 20251031+1159, 1  
3, Infrastructure planning, 20251013+0800, 20251017+1800, 1  
4, Infrastructure setup and review, 20251017+0800, 20251031+1800, 3  
5, Program rollout, 20251103+0900, 20251215+1700, 2, 4
```

2. Read a file that contains resources and their task allocation as well as load assignment information (in percentage). Some resources may work full-time (100%) or some may work part-time (50% or so). For instance:

```
Ahmed, 1:50, 3:100, 4:100, 5:50  
Ayesha, 1:50, 2:50,  
Mariyam, 1:100, 2:100, 5:100
```

3. Goal is to facilitate the scheduling through relevant functionality / analysis:
 - i) Find the project completion time and duration
 - ii) Highlight overlapping tasks. Such tasks start before their dependency is completed and there is some time frame that is common among those tasks
 - iii) Find resources that form a team for a specific task
 - iv) Find total effort (in hours) required by each resource on the project
4. Implement your solution with proper object-oriented design techniques (associations, inheritance, polymorphism, etc.). Some suggested classes are: Project, Task, Resource, Allocation, etc. Note that tasks can be organized into a hierarchy of high-level or grouped tasks along with detailed steps.