

Homework #4
CENG431 – Building Software Systems
Due Date: 21.04.2017, 23:55

Design and implement a Software Project Management program in Java that calculates total cost of the project and estimates the project's deadline.

Before a project is launched, a project team is assembled in teams. There is a project team leader that manages these teams. The hierarchy is given below.

- Project Team Leader
 - Analysis team
 - Design team
 - Development team
 - Test team

Consider that every member of a project has a predefined time of finishing his or her task and daily cost. Assume that every project member have equal skill with respect to his or her skill level. For example; if five Senior Developers are hired, they have the same power and the time of completing development task reduces by 5 as in a typical "Workers Problem". The time of finishing tasks and cost for each member is given below.

- **Project Team Leader** – 150TL/day
- **Analyst**
 - **Junior Analyst:** A single analyst finishes a task in 5 months (150 days). 65TL/day
 - **Senior Analyst:** A single analyst finishes a task in 3 months (90 days). 95TL/day
- **Designer** – 50TL/day
 - **Junior Designer:** A single designer finishes a task in 7 months (210 days). 55TL/day
 - **Senior Designer:** A single designer finishes a task in 3 months (90 days). 85TL/day
- **Developer**
 - **Entry Level Developer:** A single developer finishes a task in 2 years (730 days). 60TL/day
 - **Junior Developer:** A single developer finishes a task in 1 year (365 days). 90TL/day
 - **Senior Developer:** A single developer finishes a task in 6 months (180 days). 120TL/day
- **Tester**
 - **Senior Tester:** A single tester finishes a task in 6 months (180 days). 100TL/day
 - **Test Specialist:** A single tester finishes a task in 3 months (90 days). 130TL/day

The project leader uses this program to add/remove an Analyst/Designer/Developer/Tester to the team. The number of each project member should be entered to the program as well as the project start and end date through a GUI.

The project process follows the waterfall software life cycle. Therefore, first the project starts with analysis (Analysis Team), second design (Design Team), third implementation (Developer Team)

and finally testing (Test Team). To start a new phase, first the previous phase must be complete. Furthermore, none of the phases cannot work concurrently.

Your program should calculate the total cost of a project and each team's cost. Furthermore, your program must calculate/estimate when will the project finish and also calculate/estimate each team's time of completing their task as well. You should set the "project start time" and "project end time" input through your program.

Use Composite Design Pattern to form your project hierarchy and MVC Design Pattern for your GUI. Design and implement your program following these design patterns.

Bonus: If an option that optimizes the project members and cost by the date entered by the project team leader. You will be graded with an extra **20pts**. If an optimization technique has been used, please indicate the optimization method.

Please see the example GUI of the program. The GUI could be different from the given example. This example is only given to you to see the possible inputs that you should give to your program.

- Please create and rename your Java project as: G??_HW4_CENG431.
- Please submit your homework through CMS by exporting your Java Project.
- Export your Java Project as the given format with your assigned group ID: G??_HW4_CENG431.zip.

Junior Developer	<input type="text" value="5"/>	Project Start Date	<input type="text" value="10.04.2017"/>
Senior Developer	<input type="text" value="1"/>	Project End Date	<input type="text" value="10.04.2018"/>
	•		
	•		
	•		
	•		
Test Specialist	<input type="text" value="7"/>		
Calculated Time	<input type="text" value="452 days"/>	Expected Time	<input type="text" value="365 days"/>
Total Calculated Cost	<input type="text" value="280.000\$"/>		
Analysis Team: 50.000\$, 50days		<input type="button" value="Calculate Cost and Time"/>	
Design Team: 20.000\$, 22days		<input type="button" value="Optimize Time & Cost"/>	
Developer Team: 120.000\$, 250days			
Test Team: 90.000\$, 130days			

This Feature is
Optional. (BONUS)