Software Engineering 2 Research Project

Objectives

Students will apply skills gained in software engineering course to develop a prototype software system in specific domain. Students will work in group to document software requirements, develop the application and apply testing techniques'.

Purpose and Method

The purpose of the course project is to provide the students with the knowledge of software engineering methodology and the skills to apply it.

Teamwork and Project Management

Each team consists of 3 to 5 students working on the same project. *Teamwork is **required** since team work is an integral part of software development*
All team members must take part in all project activities and **none** of the activities should be done exclusively by one student. Each team member or a pair must be *responsible* for all aspects of development required for the features they own.

Report Format

A report is submitted by the whole team and will be graded as a whole, and points will be split among the team members according to the declared contributions
A report must have a *cover page* containing:

. the course title,
. group number,
. project title,
. . submission date, and
. all team-member names.

Negative points will be assigned to reports missing- or having an incomplete cover page.
The **second page** of each report must detail the **breakdown of individual contributions** to the project (use more pages if necessary)—. **Each student** should provide an **itemized list** of his or her contributions to components of the report, such as: requirements specification (use cases and non-functional requirements) etc and other: any other relevant contribution.

Report Section

1. Project Description
   A brief description of the purpose and objectives of this project and a brief description of what deliverables the project is expected to deliver. length: 1/2 - 1 page
2. Goals and Constraints

This section aims at describing all the goals of the project in terms of features and qualities to be implemented, as well as constraints imposed on the solution.

3. System Requirements

a. Enumerated Functional Requirements
   Extract the requirements from the customer's narrative and list them in a table, one row per

requirement. The first column shows a unique label "REQ-*x*". The second column shows briefly describes the requirement.

b. Enumerated Nonfunctional Requirements

List, prioritize, and describe the Nonfunctional Requirements. The non-functional requirements numbering should continue the functional requirements list.

4. Functional Requirements Specification

Derive the use cases based on the requirements from Section 3above..

a. Stakeholders

Identify anyone and everyone who has interest in this system (users, managers, sponsors, etc.). Stakeholders should be humans or human organizations.

b. Actors and Goals

Identify the *roles* of people or devices that will directly interact with the system, their *types* (initiating vs. participating) and the *goals* of the initiating actors.

c. Use Cases

i. Use case Description

For **all** use cases that you can think of (based on your System Requirements), write a *brief* or *casual* text description. List explicitly the requirements that each use case responds to.

ii. Use Case Diagram

Draw the use case diagram with all the use cases. Indicate the relationships, such as <<include>> and <<extend>>.

iii. Drive black box test cases for each use case

4. Architectural Design

Explain the high-level system architecture that you plan for the project. Include a high-level architecture diagram (a high-level UML class diagram)

5. Detailed Design

Complete description of the system design, UML class diagrams are to be used, as well as a short textual description describing the purpose of each class

a) Units Description

List each class in this system and write a short description of its purpose, as well as notes or reminders useful for the programmers who will implement them. List all attributes and functions of the class.

6. Testing Report

This section presents all the testing activities undertaken on the final product, as well as all the individual test cases used.

Test Cases

Description of all the test cases applied on the tested items using various techniques and testing different aspects of the system.

Unit Testing

For each tested unit,. Explain what techniques were used to derive these tests, e.g. black box/equivalence partitioning, white box/basis path, etc.

Requirements Testing

For each tested requirement, include a list of test cases presented in the form of a concrete scenario of system usage and expected system reaction.