Software Engineering Methodologies
Project

Description
Develop a UML development environment.

The system must support a set of coordinated diagrams within for a given software development project and directly support the object oriented software development process. The environment must support the following diagrams:

- Use Case
- Class
- Sequence Charts
- Activity

The environment will allow users to develop use cases for a project. For each use case there will be a set of scenarios and one or more sequence charts. It will also allow for the development of class diagrams. The sequence charts and class diagrams must be coordinated and reflect the same semantics of one another. The underlying UML meta-model must be de-coupled from the user interface and diagram rendering.

The main focus of this project is on producing a high quality requirements and design model. The implementation phase will be fairly short so construction of a complete user interface for your beta version may not be practical. You may consider using the presentation format from the online tools below to produce parts of the diagram rendering.

- http://yuml.me/
- http://www.websequencediagrams.com/

Platform
An object-oriented language must be utilized: C++, Java, or C#.
**Organization of Project**
The instructor will form teams consisting of three to five people. Each team will be assigned an identification number that will be used for presentation of data. The project will be divided into three phases:

- Requirements & Analysis
- Design
- Implementation

Each phase will result in a product and consist of a number of activities. All team members must take part in all phases of the project. Team member’s duties should be divided up in relatively equal manner for each phase.

Precise records will be kept documenting each team member’s contribution to the project. Records will be kept documenting each individual and the teams progress and duties. All faults will be recorded and amount of effort for each phase will be reported. Time sheets and defect records are required (without exception) with every product. Missing or late records will result a penalty of grade.

**Scheduled Deadlines**

**Requirement & Analysis Document**
- Initial Version: March 18th
- Independent Inspection: March 25th
- Final Version: April 8th

**Design Document**
- Initial Version: April 15th
- Independent Inspection: April 22nd
- Final Version: April 29th

**Implementation**
- Beta Version: May 7th
Requirements & Analysis Phase

Initial Requirements Document

A requirements document will be produced that precisely describes the problem requirements and the necessary domain knowledge needed to solve to construct the software systems. All features of the software product will be described and the type(s) of interface will be shown. Any necessary domain analysis specific to the given problem will be reported. Also included in the report should be the project objectives, team roles, development plan/schedule, and quality targets. Estimates of the required effort in time and product size will be needed for each phase. Email to instructor.

The report will include the following:

- Time Recording Log sheet for each team member
- Defect Recording Log sheet for each team member
- Project Time/Effort Summary sheet for each team member and a team summary
- Project Defect Summary Sheet for each team member and a team summary
- Size estimation in LOC of final product with explanation of how it was derived
- Team roles for this phase (summary)
- Projected team member roles for future phases
- Projected team schedule
- Data Dictionary
- UML Use Case Model (Use Case Diagrams)
- UML Analysis Model (Object and Interaction Diagrams)

Independent Inspection

Another team will inspect the first version of this document. The goal of the inspection process is to assess the consistency, correctness, completeness, and validity of the document with respect to the problem at hand. A report will be generated by each team describing any and all uncovered defects and faults (true or perceived) and any part of the document that warrant further explanation. Email to instructor.

The report will include the following:

- Time Recording Log sheet for each team member
- Project Time/Effort Summary sheet for each team member and a team summary
- Team roles for this phase (summary)
- List of perceived defects, faults, and unclear issues with explanations

Final Version of Requirements Document

Findings of this inspection process will be given back to the team for any rework the necessary to the document. A final version of the requirement document will then be submitted. Only one copy is required.

The report will include the following:

- Time Recording Log sheet for each team member
- Defect Recording Log sheet for each team member
- Project Time/Effort Summary sheet for each team member and a team summary
- Project Defect Summary Sheet for each team member and a team summary
- Size estimation in LOC of final product with explanation of how it was derived
- Team roles for this phase (summary)
- Projected team member roles for future phases
- Projected team schedule
- Data Dictionary
- Use Case Model (UML Use case diagrams)
- Analysis Model (UML Object and interaction diagrams)
Design Phase

Initial Version of Design Document

User interface should be separate from the underlying system. The core system should be completely portable. Estimates of the required effort in time and product size will be needed for each phase. Email to instructor.

The report will include the following:
- Time Recording Log sheet for each team member
- Defect Recording Log sheet for each team member
- Project Time/ Effort Summary sheet for each team member and a team summary
- Project Defect Summary Sheet for each team member and a team summary
- Size estimation in LOC of final product with explanation of how it was derived
- Team roles for this phase (summary)
- Projected team member roles for future phases
- Projected team schedule
- Sequence Diagrams
- Transition Diagrams
- Refined Collaboration Diagrams
- Class Diagrams showing responsibilities and relationships
- Physical Architectural model – component, package diagrams, source code organization
- Description of user interface

Independent Inspection

Another team will inspect the first version of this document. The goal of the inspection process is to assess the consistency, correctness, completeness, and validity of the document with respect to the problem at hand. A report will be generated by each team describing any and all uncovered defects and faults (true or perceived) and any part of the document that warrant further explanation. Email to instructor.

The report will include the following:
- Time Recording Log sheet for each team member
- Project Time/Effort Summary sheet for each team member and a team summary
- Team roles for this phase (summary)
- List of perceived defects, faults, and unclear issues with explanations

Final Version of Design Document

Findings of this inspection process will be given back to the team for any rework the necessary to the document. A final version of the design document will then be submitted. All items contained in inspection should be addressed. Only one copy is required. The report will include the following:
- Time Recording Log sheet for each team member
- Defect Recording Log sheet for each team member
- Project Time/ Effort Summary sheet for each team member and a team summary
- Project Defect Summary Sheet for each team member and a team summary
- Size estimation in LOC of final product with explanation of how it was derived
- Team roles for this phase (summary)
- Projected team member roles for future phases
- Projected team schedule
- Updates to:
  - Sequence Diagrams, Collaboration Diagrams, Transition Diagrams
  - Class Diagrams
  - Architectural model – component, package diagrams, source code organization
  - Description of user interface
Implementation Phase
Beta Version
Implementation Model
Test Model
A beta version will be submitted. This version should at least have minimal running capabilities.