CSC 470 Spring 2013

Collaborative Team Project
Grade: 250 points

Objectives:

The primary objectives of the collaborative project are for students to:

- Gain experience with, and a clear understanding of, the cloud offerings that can be employed for application development.
- Provide an opportunity for collaborative group work on a large scale.
- Apply concepts learned in this course to develop a large, cloud-based software application.
- Strengthen problem solving and critical thinking abilities, integrating knowledge gained in this and other courses, through the development process.
- Develop and strengthen communication abilities, project management skills, and teamwork by working collaboratively in teams.

Responsibilities:

The class will be divided into teams of 4-6 students who will collaboratively to complete a project. Each team will be expected to create source code control management systems that provide me access and oversight into the deliverables. I strongly suggest you use this opportunity to learn and use git/Github, as they are quickly becoming the industry standard.

The **team as a whole** is responsible for submitting deliverables in the appropriate formats and locations, as per the schedule specified below. Each team should maintain a ticket/issue/bug tracking system to aid in time management for the project. Each team should maintain a public wiki for dissemination of design documents, notes, screen shots, etc. The source code control system, ticket system, and wiki need to provide access to the instructor.

Each team member is responsible for attending all project meetings, responding to team communications, and collaborating to complete tasks in a timely manner. Every team member is expected to contribute substantially to the project. Students who do not collaborate or respond appropriately at any stage will lose points for that stage. Student participation will be evaluated multiple times by both the team and the instructor.

Collaborative Project Grade and Schedule:

The project will be completed in stages as described below. Each stage has a 10% penalty per day for late submissions. 10% of the grade for each stage will be based on effective use of collaborative mechanisms like git, the wiki, and group meetings. You may be required to modify documents in various stages to reflect feedback from me, or changes in the project specifications. Each stage will be assigned an intermediate grade. Updates to that stage may result in a better final grade.

	Stage	**Deadline**	**Max. Grade**
0	Team Formation	2/28/13	N/A
Ia	Proposal and Specifications draft	2/7/13	10
Ib	Proposal and Specifications revised, and presentation	2/13/13	10
II	Requirements Modeling and Analysis	2/17/13	50
III	Design	2/25/13	50

IVa IVb	Implementation – Phase 1 Implementation – Phase 2	3/29/13 4/26/13	20 35
V	Final Presentation (at final exam)	Est. 5/1/13	25
VI	Final Project Report (by final exam)	Est. 5/1/13	25
	Innovation and Collaboration		25
	Total		**250**

Stage 0 – Project Team Formation

Students will form teams and give their team and project suitable and creative names.

Deliverables:

The wiki project page updated with the team name, and names and contact information of all team members. Teams may wish to use the collaborative items in Canvas for this.

Stage I – Inception: Project Proposal and Specifications

Each team will do some research on the problem domain, and brainstorm and collaboratively elaborate on their project idea. A suitable project:

- Is large enough to require several persons' effort in order for it to be completed in a timely manner.
- Will implement an innovative approach for solving the defined problem.
- Utilizes no less than 5 of the Amazon Web Services for the solution in a significant (non-trivial fashion).
- Will capitalize on each team member's skills, interests, background, and experience.

Based on their discussions, the team will prepare a 'Specifications' document (2-3 pages) that describes the problem and possible approaches to solve it. Address at least the following:

- Problem Statement.
- Objective of the system.
- Description of the desired end product.
- Statement about the importance and need for the project.
- Other similar systems (prior art).
- Explanation of why and what aspect of the project is innovative (how it is different from other similar systems).
- Technologies (e.g. tools, languages, etc.) and computer science concepts the team will need to learn.
- A diagrammatic representation of the system boundary – which modules will be implemented and which will not.
- Other possible applications of the system.

Each team will create a 'roadmap' (Gantt chart) with preliminary milestones that will be publically available (via github [preferred] or another tool) to aid in time management for the project. The initial milestones will list the stages for the project with deadlines as specified in this document. The team is responsible for keeping this updated with details of subtasks, intermediate deadlines, tickets, resource requirements, etc., and each member must contribute equally to this effort.

Deliverables:

1. The project page on the wiki updated with
   - Team name, project name, and names and contact information of team members.
   - Link to the Project Proposal and Specifications document, in .doc or .pdf format.
2. Project roadmap updated with milestones and tickets in github.

Stage II – Elaboration: Requirements Modeling and Analysis

Each team will review the specifications with the customer (me) to discuss the requirements and scope of the project. All members of the team must be present at this review. It is the team's responsibility to arrange the meeting with the customer.

Based on the discussions, the team will prepare a document to describe the important features of the system. Address at least the following, in addition to the information required for the previous stage:

- Legal issues – specify which laws will impact the implementation or use of the system.
- Possible applications of the system.
- Use Case Diagram for the system.
- Detailed (step-by-step) Use Case Descriptions for all the use cases.
- A series of mock-up images/pages that show the user interface for your application (web, mobile, or native), with descriptive, detailed paragraphs that explain their purpose.
- A proposed site structure (if web application) chart (see http://webstyleguide.com/wsg3/3-information-architecture/3-site-structure.html)

Use an UML-aware tool, like Lucidchart, to draw the diagrams in an applicable UML notation.

Further refine and publish the milestones detailing the subtasks and resource allocation for each stage. Create tickets to assign tasks to each team member.

Deliverables:

1. The project page on the wiki updated with a link to the Requirements and Analysis document(s) in .doc or .pdf format.
2. The 'pdf' or 'doc' version of the document in the selected source code control system.
3. Project roadmap updated with milestones and tickets.

Stage III – Elaboration: Design

Each team will schedule and meet with the customer (me) to review the Requirements and Analysis document. All members of the team must be present for the meeting. It is the team's responsibility to arrange the meeting with the customer.

Based on the discussions, feedback and evolving needs, the team will prepare a document to describe the proposed design for the system.

- Detailed Design Class Diagram – clearly identify the classes that will be implemented for Implementation Phase 1.
- System Sequence Diagram(s) or Collaboration Diagram(s).
- Detailed Statechart(s) for all the major functionality.
- User interface design for the system. Explain, with examples, how the system will satisfy each of the eight golden rules of user interface design.

Use an UML-aware tool, like Lucidchart, to draw the diagrams in correct UML notation.

Further refine the milestones detailing the subtasks and resource allocation for future stages. Create tickets to assign tasks to each team member.

Deliverables:

1. The project page on the wiki updated with
   - Link to the Design document (in .doc or .pdf format).
   - Revisions as required to previous stage documents.
   - The 'pdf' or 'doc' version of the document in the selected source code control system.
2. Project roadmap updated with milestones and tickets.

Stage IV – Construction: Implementation and Testing

Using the selected web application language/technology platform, implement the design developed so far. The program must follow good programming and documentation guidelines, be user-friendly, implement elegant code, and handle errors gracefully. Test the implementation thoroughly to ensure the system performs as per expectations. Utilize the Use Cases from Stages II and III as test cases for this stage.

Further refine the milestones in your ticket system detailing the subtasks and resource allocation for future stages. Create tickets to assign tasks to each team member.

Deliverables:

For Phase 1 submit in the selected source code control system the source code for classes identified in Stage III.

For Phase 2 submit in the selected source code control system the source code for the complete project.

1. The project page on the wiki updated with
   - A series of screen captures demonstrating successful execution and testing of the program, linked to project page.
   - Revisions as required to previous stage documents.
2. Appropriately documented working source code in the selected source code control system.
3. Project roadmap updated with milestones and tickets in the ticketing system.

Stage V – Transition: Final Project Presentation

Each team will present a summary of their project and demonstrate the working system to the class as part of the final exam session. Each team will be allotted 20 minutes: 15 minutes for the presentation and 5 minutes for questions. Every member of the team is expected to participate equally in the presentation.

The presentation will include a brief overview of the project, the final design and any interesting aspects, etc. (about 10 minutes). The focus, however, will be on demonstrating how the product works, what challenges were faced and how they were overcome, and insights gained from the project experience.

Use a presentation tool like PowerPoint to create and present the slides in a professional manner. Ensure that the presentation and demonstration are in suitable formats for the instructor's machine in the classroom. Alternatively, you may use your own laptop, but you should test that it works before the class starts.

Deliverables:

1. Oral presentation and product demonstration to the class.
2. The project page on the wiki updated with link to slides.

Stage VI – Transition: Final Project Report

Organization and presentation of the final report will affect the final grade. If there are modifications to any of the documents submitted in previous stages, include the clearly marked updated documents along with the original graded documents. The report is essentially a well-organized wiki page with, at a minimum, the following information in the order listed:

Team Identification:
Team name, project name, and names and contact information of team members.

Inception: Objectives and Overview
In this section, describe the project goals and aspirations – why you chose this particular project, what you hoped to learn, the original plan for the project, etc. This will be about one or two pages long. Include the original and clearly identified modified documents for Stage I.

Elaboration: Requirements Modeling and Analysis
This consists of the documents submitted for Stage II, with revisions clearly identified.

Elaboration: Design
This consists of the documents submitted for Stage III, with revisions clearly identified.

Construction: Implementation
This consists of the complete source code for the working system in the selected source code control system, submitted for Stage IV.

Construction: Testing
This consists of the scripts demonstrating successful compilation of the application code and successful execution of test cases, submitted for Stage IV.

Transition: Maintenance
This is satisfied if the source code is appropriately documented and the final report is appropriately labeled and organized.

Transition: User Instructions
This consists of a brief write-up or 'manual' on the use of the system.

Experience and Conclusions
Each team member will submit in the appropriate Canvas dropbox:

1. An individual two-page description of the project management structure and reflection on the experience of working on this project, particularly as part of a collaborative team. Include references to the team organization, things you learned as a result of the project, difficulties and challenges faced, particularly with the collaboration aspect and how they were overcome.
2. An individual two-page reflection on the lessons learned through the experience of working on the project.

Deliverables:

1. Project wiki page organized as specified above.

2. All required documents and source code in the selected source code control system.
3. Project roadmap updated with milestones and tickets in the ticketing system.