CS 425
Software Engineering

Fall 2024

On Software Engineering, Assignment #1, and Capstone Projects

August 29, 2024

University of Nevada, Reno

Overview

- Significance of Software Engineering
- Students' Very Brief Introduction [partial]
- Overview of Assignment #1
- More on Capstone Projects

Significance of Software Engineering

- "Our civilization runs on software" [Bjarne Stroustrup, the creator of C++]
- SE a pretty good field currently

According to the U.S. Bureau of Labor Statistics (BLS), the number of job opportunities within **software** development is projected to increase 24% from 2016 to 2026, much higher than the national average growth rate for all professions of 7% These numbers point to the bright **future** of **software**

Significance of Software Engineering

- Opinions on SE's future vary, e.g.,
  - There will always be software engineering

    https://interestingengineering.com/15-reasons-why-software-engineering-can-never-die
  - SE will be obsolete by 2060

    https://medium.com/@dtauerbach/software-engineers-will-be-obsolete-by-2060-2a214fdf9737

Grady Booch's Why Engineering?

Grady Booch

Video: Why Engineering? by Grady Booch

Very Brief Student Introductions

A#1 Overview

Department of Computer Science and Engineering
College of Engineering, University of Nevada, Reno
CS 425 Software Engineering

Individual Assignment #1
(A1)

August 29, 2024
Due: Monday September 9, 2024, 11:59 pm
Weight in course grade: 6%

University of Nevada, Reno

A#1 Overview

1. Possible project idea [35 points]

Give an example of a software-intensive product that you, as an entrepreneur and/or manager would like to develop with a group of 3 or 4 other software engineers (and possibly other specialists) working under your supervision.

Describe this software-intensive product and explain why it would be innovative and useful.

Indicate its expected users and outline its main functions and features/capabilities.

A#1 Overview

1. Possible project idea [35 points] - continued

Briefly indicate the roles of the team members who will be working with you.

Describe the origins of your software product idea (how the idea came to you) and compare your proposed solution with at least two (relatively) similar existing products

[500-750 words in total]

A#1 Overview

2. Your target CSE-related job [35 points]

Even though you may have other career plans (like going for graduate studies or changing your areas of expertise), or even if you have already a job lined up for you, please describe your target (in a way "dream," but also realistic) computer-related job after graduation.

Note this may not necessary be a software engineering job, but it should be CSE-related. Consider will be your full-time position after completing your BS in CSE degree at UNR.

A#1 Overview

2. Your target CSE-related job [35 points] - continued

Explain why you would like this job, what you expect it would entail, what skills and/or preparation you think it would require, and what related challenges you may encounter on the job.

Also, indicate the (approximate) title for this job position and the job's specific field or domain (e.g., financial, healthcare, education, military, etc.).

Finally, outline a couple of potential related specific projects or applications that you expect to be working on in this job.

[500-750 words in total]

A#1 Overview

3. Software quality [30 points]

Consider a software application or tool that you are either familiar with or like to know more about (e.g., a mobile application, a computer game, a web-based application, a GUI builder, etc.), describe its main purposes, and give 3 examples of its main functions or features/capabilities that demonstrate good quality.

Explain why you think these are examples of good quality software.

A#1 Overview

3. Software quality [30 points] - continued

Also, give 3 other examples of this software tool's functions or features/capabilities that could be improved or could be added (poor quality software).

Briefly suggest ways to improve existing functions/features/ capabilities and explain why the additional functions/ features/capabilities that you propose would be useful.

A#1 Overview

Notes on submission:

- Remember that this is an individual assignment, not to be done as a team.
- Number the answers to the questions.
- Include page numbers in to your PDF document.
- Assignments must be submitted through Canvas (Web Campus) in PDF format.

More on the Capstone Projects

- Each team will consist of 3, or 4 students
- Projects start in October in CS 425 and end in May in CS 426
- In CS 425 (Fall) the goal is to create a concept, initial specification and design, and an early prototype
- In CS 426 (Spring) the concept and design will be further elaborated and expanded, and a functional software product will be developed
- Project topics may change in January, but this is quite rare
- In principle, team members could also change in January, but this is extremely rare

More on the Capstone Projects

- Each team must have 1 to 3 external advisors, who know the project's topic and you must meet with them monthly (bare min)
- Project sponsors/external advisors could be faculty from UNR or professionals from business and industry
- Graduate students could also be external advisors
- Project topics could come from the following sources:
  - Faculty at UNR or other academic institutions
  - Businesses or industry organizations
  - Team members themselves
- Regardless of source, all project topics must be approved by the CS 425 course instructors in individual project meetings with the teams held in early October

More on the Capstone Projects

- In September potential external advisors/sponsors are invited to pitch their proposed topics
- Sponsorship cannot be given directly to the students in any form (no money, equipment, gifts, or hiring for the students) but funding could be given to the CSE department to support senior projects
- The student teams might or might not approach potential advisors to work on a topic (selecting a topic is free for teams, not mandatory, but the topic selected must be approved by instructors)
- Similarly, potential external advisors/sponsors may or may not select a team that approaches them for working on a topic

More on the Capstone Projects

- **All team members are expected to participate in all project parts**, otherwise grades can be different within a team (including possibly a grade of 0)
- **Limited or lack of participation in coding** will result in a low grade in Project Part 4 (including possibly a grade of 0). A grade below 50% in P4 will lead to an “F” for the course.
- Project parts in CS 425:
  - P1 Concept
  - P2 Specification
  - P3 Design
  - P4 Prototype

More on the Capstone Projects

- Please note that due to its expected public exposure, your project must have a user interface
- It is OK to have some research involved but this capstone project is primarily about software development
- Projects may or may not have some specific hardware components