[CS304] Team Project for 24 Spring

A major component of this course is a software development project in team efforts. Your team will propose, design, develop, and maintain a practical and production-level software product.

Project Suggestions

The team project should have the students, faculties, and/or staffs of SUSTech as the potential target users. The project's objective should focus on enhancing the efficiency and productivity in users' daily work, study, and/or related activities.

Here are a list of suggested projects.

1. Coursework Grading System

CS students use Blackboard (BB) for text and image-based assignments submission, Online Judge (OJ) for code submissions, while midterm and final exams are assessed through traditional paper-based grading.

The problem is, students are required to submit different types of assignments across multiple platforms; code evaluation is affected by test case quality, while handwritten work can affect final scores due to handwriting quality. Also, website traffic affects the speed of access (e.g., on the day of deadline).

Design and implement what you consider to be the best Assignment Grading System. The system should not be the same as BB, Sakai, or OJ. You can either design a brand new project that has a completely different design from the existing systems, or you need to make significant improvements to the existing systems/design to solve the aforementioned problems. Here are some of the potential improvements:

- **Unified Platform**: integrate the assignment submission modules of OJ and BB, allowing students to submit and evaluate varied types of assignments (e.g., text, code, image, etc.) on the same platform.
- **Easy Check:** convert individual handwritten work to PDF or DOC documents for online viewing.
- **Efficiency Enhancement:** implement (semi-)automated grading for handwritten coursework and exam papers.
- **Experience Improvement:** solve the problem of slow website performance during peak hours.
- **...**

2. Intelligent IDE

As CS students, the use of IDE is a part of our daily life. Based on your experience of using IDE, which improvements or interesting features would you like to use that are missing from the current IDE?

Please design and implement an intelligent IDE that helps your coding and study activities. Some ideas:

- A dedicated IDE tailored for a specific course (such as Digital Logic) to solve course-specific challenges
- An IDE that incorporates course resources (e.g., lecture slides, assignments, links, notes, etc.) to assist coding
- An IDE integrated with AI technology to achieve automated code completion, bug detection, bug repair, and test case generation, etc.
- An IDE that supports interesting coding workflows, such as the drag-and-drop style of programming (e.g., Scratch)

- Collaborative coding for multiple users
- ...

The programming languages supported by the IDE are not limited. However, as an IDE, it should at least support editing, compiling, and code execution capabilities.

3. Academic Assistant

SUSTech adopts a flexible course selection system. Students, especially freshmen, typically have tons of questions of which courses to choose at which semester, which courses are valuable to take, what contents are delivered in a specific course, etc. Students are also eager to acquire advices and instructions on their academic management.

Please design and implement a system to assist students in efficiently managing their academic life, ensuring a rewarding university experience. Some ideas:

- **Course selection:** the system can provide course portfolio recommendations based on students' preference (e.g., course content, schedule, instructors, etc.), course selection history, and previous course performance, helping students to efficiently select courses.
- **Study advice:** students can use system forums for course discussion, sharing course materials, providing study tips, asking for help, etc.
- **Tutoring and counseling service:** on the system, students can apply for individual tutoring, using either online payment or forum points. If academic stress becomes overwhelming, students can also apply for the campus counseling services for help.
- **Second-hand transactions**: on the system, students can engage in the online/offline exchange of second-hand textbooks, equipments, study materials, etc.
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4. Campus Events and Entertainment Center

Please design and implement a "Campus Events and Entertainment Center" system, in which users can view information for SUSTech performances (e.g., musical concerts), distinguish lectures (e.g., by Turing Award recipients), competitions (football match, coding skill competitions), and other events. Users could also book tickets, make reservations, or write reviews. Specifically,

- Users can explore specific information about various events, including categories, maps, venues, etc.
- Users can make reservations, book seats, and purchase tickets for various events.
- The system also supports user reviews, communication, assistance, and (real-time) information sharing (e.g., video clips, pictures, etc.) for events and activities
- The system can provide event recommendations
- ...

5. Campus Adventure Game

Every fall, SUSTech welcomes new students, and freshmen need some time to become familiar with the campus and the new environment. Please design and implement an interesting game (role-playing, strategy, adventure, simulation etc.) to help freshmen quickly adapt to SUSTech campus and life. Some ideas:

- Tips and recommendations for cafeteria
- Maps to key landmark buildings, their views, opening hours, etc.

- Recommendations for college clubs, interest groups, student unions, etc.
- Tips and warnings for off-campus shopping and dining
- Adventures for campus legends and ghost stories.
- ...

6. Others

You may propose other projects, but with the following requirements:

- You should NOT reuse or adapt existing projects from other courses (e.g., OOAD, Innovation Practices) or from previous semesters of CS304. Once found, **you'll get 0 point for the team project**.
- Every team member should submit a description of his/her OOAD project (if course taken) and the Innovation Practices project (if course taken) for justification.
- The proposed project should follow the general requirements by having the students, faculties, and/or staffs of SUSTech as the potential target users. It should focus on enhancing the efficiency and productivity in users' daily work, study, and/or related activities.
- The proposed project should have a clear set of target users with requirements. In other words, your project should not be motivated by imaginary users and imaginary requirements. For the same reason, exploratory or research prototype is not recommended as the team project.
- The teaching team will evaluate if the proposed project is appropriate to proceed.

General Requirements

1. The final software product should be practical, executable and usable. There should also be at least 2 major releases of your project, each release should be executable (details will be described in each milestone).
2. The project should support at least 5 distinct, notable features (details described in the first milestone).
3. You should NOT directly reuse an entire existing open-source project (e.g., forum) and claim it to be your team project. However, this could be integrated to your project as a feature.
4. You could also reuse 3rd-party libraries, frameworks, APIs, though, but the significant parts of your product should be implemented by your team members.

Techniques

The team project can be a stand-alone desktop application, a web application, a mobile app, a toolkit, etc. that satisfy the requirements.

Most projects will use Java, Python, or C++, on Unix, Windows, or Macintosh computers, but you are encouraged to use whatever that is right for your particular product.

Every project should use `git` to manage the source code, documentation, as well as other necessary artifacts.

Policy for using AI

As we'll learn throughout the course, AI is reshaping the software engineering practice. Hence, you are encouraged to leverage AI through the entire development process of the team projects.

However, for any code, script, configurations, documentation, ideas, and artifacts generated or influenced by AI, you must include clear and concise references alongside the AI-generated entity, stating clearly the AI tools, versions, models, prompt, means of usage, and any adaptation you did for this entity. **Failures to do so**

will be considered as violations of academic integrity. Detailed instructions are included in the description of each milestone.

Teams

At the beginning of this course, you will form project teams with 4 to 5 members. During the semester, the project team will work together through the full development cycle.

Please form a team based on the following requirements:

- The size of the team must be 4 or 5. A team of size less than 4 or larger than 5 is NOT accepted.
- Teams will make a series of project presentation during labs throughout the semester. EVERY team member needs to show up during the presentation. For this reason, we recommend you to **find team members from the same lab session**.
- If you have to team up with students from other lab sessions, you should choose which lab session will your team be presenting throughout the semester, and this lab session could not be changed later.

Please see our github-classroom tutorial for how to create a team.

Milestones & Deliverables

The team project has 3 milestones, in week 5 (proposal), week 9 (the 1st sprint), and week 16 (the 2nd sprint), respectively.

At each milestone, **each team** is required to:

- **Submit a set of deliverables**. Typical deliverables include working code, documentation, report, configuration files, test suites, etc.
- **Deliver a 10-minutes presentation** during the lab session.

The three primary criteria for a successful project are: satisfying the client's needs, usability of the product, and maintainability over the life of the product. Please take these criteria in mind when developing your project.

Detailed grading scheme will be released before each milestone.

Contribution

By default, we consider each team member has the same contribution (e.g., 0.25 :0.25 :0.25 :0.25 for a team of size 4).

For milestone 2 and 3, teams could report adjusted contribution (e.g,, 0.3, 0.3, 0.2, 0.2, sum up to 1). Scores will be re-calculated based on our score-adjustment schema.

Finally, **the rewarded overall scores for extra contribution should not exceed 2 points**. That is, you'll got at most 47 (45+2) points for the team project.