SENG 401
Software Architecture

Lecture 5
Topic - Project and Lab Details

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Course Project
Overview Topic

- Each project is about the recovery, evolution and quality analysis, and comparison of a suite of large-scale source software systems.

- For each project this year, each group will analyze and compare the architecture of **two types** of software systems:
  - Type 1. Software systems using machine learning (ML) libraries
  - Type 2. Software systems not using ML libraries

- Each project will analyze similar software systems underlying a **theme**, e.g., software offering "smart home" features, software offering "secure messaging" feature, etc.

- The theme for each group should be different from other groups.

- You will use Boa to search for the software repositories in GitHub that match the above criteria.

Course Project
Overview Procedural

- Each project is performed in a group of 6 students.

- Each project has two components: individual and team
  - The individual component is completed by each student in a group
  - The team component is completed by the students in a group together

- Grading of the project is determined by both individual and team components.

Course Project
Overview Individual Component

- A group of 6 students will pick total 6 software systems

- The source code and issue reports of the software should be downloaded from GitHub.

- Each student will analyze one software system. Each student will report his/her analysis in the report as well as in the course presentation. The reporting will follow architecture documentation notation and theories that the student will learn in the course.

- Each student will analyze the following per software system:

Task	Overview
Architecture recovery	How the architecture looks like in the most recent three versions of the software system?
Architecture Evolution	How the architecture has evolved in the most recent three versions of the software system?
Architecture Smells	What are the smells (i.e., bad architectural designs) found the software system and how the smells changed in the last three version of the software system?

Course Project
Overview Team Component

- Once each student in a group finishes his/her individual assessment of the software system he/she analyzed, the group will compare the architecture of the six software systems by answering questions like
  - How do architectural smells distribute between the two types of software systems?
  - …
- Each student in a group will produce at least one question to do the above comparison.
- Each student in a group is responsible to write the answer of one/more question and to do the analysis as well as the reporting.
- The grading of each student in a group is based on:
  - His/her performance in the individual component
  - His/her performance in the team component
- The group as a whole will compile and write the remaining parts of final report, e.g., introduction, conclusion, discussion of implications of the findings, etc.
- The grading of a group will be based on the overall quality of the report

Lab Setup

- The first two labs are used to setup/introduce two tools
- Each of the remaining labs will be used to experiment with the automated recovery, evolution and quality control of architecture of a software system
  - Each week the source code of a software system will be downloaded from GitHub.
  - The TAs and the students will work together to investigate the architecture of the system based on what they have learned in the course lectures.
  - The steps in each lab are as follows:
    - First the TAs will introduce the software system.

Lab Setup

- The steps in each remaining lab are as follows:
  1. TAs will introduce the software system.
  2. TAs and the students will download the software system data (code and other artifacts) from GitHub.
  3. TAs will give each student a set of tasks that they can do to analyze the software system, e.g., architecture recovery, architecture documentation, etc. The task will be based on the course lectures.
  4. TAs will work together with the students to complete the tasks.