# CPEN 321 Software Engineering
# Winter 2023

## M5: Code Review (Monday, Nov 6, 9pm PT)

The deliverable for this milestone is automated and manual code reviews. You will:

- Perform an automated code review of both front-end and back-end of **your own** project.
- Perform a manual code review of both front-end and back-end of **your peer group project.**
- Analyze and fix issues identified by your own and your peer group reviews.

Make sure to meet your peer group way before the deadline!

You can use assistive AI technology (namely, ChatGPT 3.5) when working on this assignment. No points will be deducted for documented use. However, undocumented use will be considered academic misconduct and will be treated accordingly.

You must document and critically analyze all usages of ChatGPT during the process of working on this assignment in a systematic way described below. This analysis **must be submitted** as part of the assignment and will be graded. Using ChatGPT 4 or any other version / AI technology is **not allowed**, for fairness (so that all students will get the same level of support).

**SETUP**:

1. Use the instructions below to set up Codacy (https://www.codacy.com/) – an automated code review tool – to work on your repository
   - Follow the guide here: https://docs.codacy.com/getting-started/codacy-quickstart/
   - In the "Built-in tools" section of the "Code patterns" page, enable the code checking tools listed below and disable all other tools:
     - Checkstyle for Java
     - ESLint for JavaScript
     - PMD for Java and JavaScript
   - Download *M5ConfigFiles.zip* from the Canvas Files section, unzip it, and push all individual files (.eslintrc.json, checkstyle.xml, ruleset.xml) to the root directory of the main branch.
   - Configure Codacy to use the selected configuration files, following the instructions here: https://docs.codacy.com/repositories-configure/configuring-code-patterns/.

     **NOTE**: Do not alter the provided configuration files or Codacy setup in any way. Specifically, do not disable any Codacy checks, do not exclude any files, do not use inline code comments to suppress issues, etc. **Altering the setup will cause you to lose all marks for the entire milestone.**

2. Set up a meeting with your peer-group to manually review their front-end and back-end code and have them review your front-end and back-end code. Make sure the meeting is scheduled way before the deadline to leave you enough time to analyze and fix the identified issues.

**SUBMISSON**. The submission for this milestone will include two parts.

**PART I.** a PDF file named "M5_Report", which includes the following information in the order specified below:

1. Names and student numbers of all group members
2. A short description of the project
3. The contribution of each group member to the work done for this milestone. 1-2 sentences per member **[2 points]**
4. Changes in the project scope, requirements, and design, since the corresponding milestones **[6 points]**.
    - If no changes were made, state "None". However, note that mismatches between your requirements/design and your implementation will cause you to lose marks.
    - If there are changes, describe each change by including:
        - The new artifact (a use case diagram, a functional requirement specification, a non-functional requirement, a new module, interface, design diagram, etc.), as required in the previous milestones.
        - The reason behind the change. Please make sure the justification is clear and reasonable.

5. Automated code review results: run Codacy in the main branch of your project (likely your MVP version, but you can also push a more advanced version into the main branch, if you have one available). Report all of the following **[10 points]**
    - The link to your project repository and the SHA of the commit that Codacy ran on.
    - The number of identified issues in each of the following categories: code style, security, error prone, performance, compatibility, code complexity, documentation, and unused code. For simplicity, you can copy or take a screenshot of Codacy's "Issues Breakdown" table into your report.
    - The number of issues for each of the identified issue patterns (again, you can copy or take a screenshot of it directly from Codacy).
    - For each issue pattern, give one concrete example from your code.
6. Fix the identified issues and push the fixes to the main branch. Run Codacy again on the main branch after the issues were fixed. Report all of the following **[30 points]**
    - The commit SHA that Codacy runs on.
    - The number of identified issues in each category and the number of identified issues for each pattern after the fix, as in item 5.
    - To receive full marks, there should be either 0 issues left or every issue that is left needs to be thoroughly justified. That is, there should be a well-formed and well-documented reason not to fix Codacy issues, with appropriate justifications and with citations to reputable sources.
        - Marks will be deducted for justifications that are opinion-based (e.g., an opinion on StackOverflow).
        - In reality, it is often easier to fix the issues than to provide sufficient evidence for not fixing it; points will be deduced for remaining issues that do not have an adequate justification.

7. Reflections on using / not using ChatGPT 3.5 when fixing issues identified by Codacy **[10 points]**.
   If you did not use ChatGPT 3.5 when fixing issues, you must answer the following questions in 1-2 paragraphs each:
   - Why did you decide not to use ChatGPT for this assignment?
   - Show concrete examples of its inadequacy.
   - Did you use any online resources (StackOverflow or similar) instead? If so, name the resources you used, explain how the resource was used, and why this is more beneficial than using ChatGPT.
   - Is there anything else you would like to share about this process?

   If you used ChatGPT 3.5, you must answer the following questions in 1-2 paragraphs each:
   - How many issues in each category did you fix with the help of ChatGPT.
   - What are two good examples where ChatGPT correctly helped to understand and fix the reported issue? Why?
   - What are two bad examples where ChatGPT was incorrect in helping to understand and fix the reported issue? Why?
   - What are the advantages of using ChatGPT for this task?
   - What are the disadvantages of using ChatGPT for this task?
   - Is there anything else you would like to share about this process?
8. Manual code review results: two major issues that you found in **your peer group code** via a manual code review **[15 points].**
   - Major issues are those that typically cannot be found by automated tools and relate to security, inefficiency in algorithms, etc. They should not be minor issues such as comments.
   - Yes, you will find some major issues – there is no code without issues.
     If you report that you cannot find any major issues in your peer group code and then TAs do, you will lose marks. However, if TAs do not find any issues either, you will get the full mark.
9. Two major issues that your peer group found **in your code [5 points].**
   - These two issues should match the issues reported by your peer group, verbatim. I.e., agree on and use the same text in both reports.
10. Fix the issues identified by your peer group **[10 points].**
    - In your report, specify how you addressed these issues, e.g., by showing screenshots of the corresponding code before and after the change and providing 2-3 sentence explanations about each fix**.**
    - If your peer group did not find any major issues in your code, ask your teammates working on the back-end to review the front-end code and vice-versa. Report on and fix the identified issues.
    - If you report that neither your peer group nor your own group member can find major issues in your code and then TAs do, you both will lose marks. However, if the TAs do not find any issues in your code, you will get the full mark.

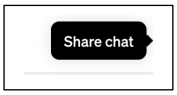
11. Reflections on using / not using ChatGPT 3.5 when performing manual code review **[10 points]**.
    If you did not use ChatGPT 3.5 when performing manual code review, you must answer the following questions in 1-2 paragraphs each:
    - Why did you decide not to use ChatGPT for performing manual code review?
    - Show concrete examples of its inadequacy.
    - Is there anything else you would like to share about this process?

    If you used ChatGPT 3.5, you must answer the following questions in 1-2 paragraphs each:
    - How much did you rely on ChatGPT for the manual code review? (0 – 100%). Specify the number of methods in your peer team's front-end and back-end code for which you relied on ChatGPT for your manual code review. Ask your peer team what is the total number of methods in your code and calculate the fraction of methods reviewed with the assistance of ChatGPT from the total number of methods.
    - Which of the issues that you found in your peer group code were produced with the help of ChatGPT 3.5?
    - What are the advantages of using ChatGPT for this task?
    - What are the disadvantages of using ChatGPT for this task?
    - Is there anything else you would like to share about this process?

12. Names and a short description of the purpose of all ChatGPT conversations (prompts and replies) used when working on this milestone. Each conversation should be saved and uploaded as an HTML file, as specified in Part II **[2 points]**.

**PART II**: Submit all ChatGPT conversations (prompts and replies) that were used or attempted when working on this milestone. Each conversation should be saved and uploaded as an HTML file, using the procedure described below:

- Click on the "Share Chat" icon in the top right corner of the ChatGPT Web window.
- Click on "Copy Link". The link to the chat will be copied to clipboard.
- Open the link in a new tab of a Web browser.
- Save the page by pressing Ctrl + S.
- Name the file using the following schema: CR_N.html, where N is the sequential number of the chat used for this milestone. For example, "CR _2" is the second chat used for this milestone.




<u>Assignments that relied on ChatGPT but do not declare the use and do not attach ChatGPT conversations will lose all marks for the milestone.</u>

Good luck!