P-16:
Connect4 Project Plan

March 5, 2025

Project Timeline

This timeline will cover the planning aspect of all tasks within the CONNECT4 branch. Each member is expected to contribute 3 × 45 minutes per week.

0.1 Planning and Design

- Create planning documents for CONNECT4 branch

    o Outline all tasks and set rough dates for each phase

    o **Deadline:** March 5, 2025

- Design use case diagram

    o Create a draft of the use case diagram for approval, then design a final use case diagram.

    o **Deadline:** March 6, 2025

- Design class structure diagrams

    o Create a general class structure diagram for classes in CONNECT4.

    o **Deadline:** March 6, 2025

- Create use case descriptions document

    o Identify and provide details to different use cases.

    o **Deadline:** March 6, 2025

- Review and submit documents for iteration 1

    o Team review, spell checking, format checking, proofread, then submit to D2L dropbox.

    o **Deadline:** March 6, 2025

Milestones

- Team 7 : : Iteration 1**:** March 7, 2025

0.2 Development and Implementation

- **Objective:** Develop and implement the core Connect4 game functionality in Java.

- **Duration:** March 8, 2025 - April 11, 2025 (Post-Iteration 1 to Iteration 3 deadline)

- **Key Features:**

    o Render and manage the game board using ConnectFourBoard class.

    o Implement core game logic (drop piece, validate moves, check win conditions) in ConnectFourGame class.

- Integrate CONNECT4 game module with the main GUI so that it appears as a selectable game from the main page.

- Ensure seamless interaction between GameWindow and CONNECT4 classes (correct title display, UI event handling, etc.).

The Development & Integration will be divided into these phases: Setup, Core Development, Integration, Testing, and Review.
Tasks will be assigned based on teammate capabilities and workload.

Phase 1: Setup

- **Duration:** March 8, 2025 - March 12, 2025

- **Goal:** Establish rough skeleton code and finalize design for CONNECT4

Task List:

- Git Repository Setup

  - **Start Date:** March 8, 2025

  - **End Date:** March 8, 2025

  - **Estimated Time:** 1 hour

- Finalize class structure design

  - **Task:** Create and update class diagrams for ConnectFourBoard and ConnectFourGame, including their relation to GameWindow.

  - **Start Date:** March 9, 2025

  - **End Date:** March 10, 2025

  - **Estimated Time:** 4 hours

- Stub Core Game Logic Methods

  - **Task:** Add placeholder methods in ConnectFourGame

  - **Start Date:** March 10, 2025

  - **End Date:** March 11, 2025

  - **Estimated Time:** 2 hours

- Plan GUI: Create a sketch for the CONNECT4 GUI

  - **Task:** Sketch how CONNECT4 components (board, drop buttons) will integrate into GameWindow.

- o **Start Date:** March 11, 2025

- o **End Date:** March 12, 2025

- o **Estimated Time:** 3 hours

Milestones:

- Setup complete: March 12, 2025

Phase 2: Core Development

- **Duration:** March 13, 2025 - March 25, 2025

- **Goal:** Implement the core functionality of CONNECT4

Task List:

- Develop CONNECT4 Board Functionality

  - o **Task:** Implement methods for board initialization, rendering the 7x6 grid, and updating board state after moves.

  - o **Start Date:** March 13, 2025

  - o **End Date:** March 15, 2025

  - o **Estimated Time:** 4 hours

- Implement CONNECT4 Game Logic

  - o **Task:** Develop move processing (dropping pieces in the correct column), alternating turns, and checking win/draw conditions.

  - o **Start Date:** March 16, 2025

  - o **End Date:** March 20, 2025

  - o **Estimated Time:** 8 hours

- Integrate Game Board and Logic Internally

  - o **Task:** Ensure that moves in CONNECT4 correctly update board state and trigger win/draw logic.

  - o **Start Date:** March 21, 2025

  - o **End Date:** March 23, 2025

  - o **Estimated Time:** 3 hours

- Code Review

- o **Task:** Conduct team code review and refactor based on feedback.

- o **Start Date:** March 24, 2025

- o **End Date:** March 25, 2025

- o **Estimated Time:** 2 hours

Milestones:

- Core Development Complete: March 25, 2025

Phase 3: Integration

- **Duration:** March 26, 2025 – April 2, 2025

- **Goal:** Integrate the CONNECT4 game with the main GUI (GameWindow) and ensure proper linkage with main menu flows.

Task List:

- Integrate CONNECT4 Module with GameWindow

  - o **Task:** Ensure that the CONNECT4 game instance (both ConnectFourBoard and ConnectFourGame) is correctly passed to and handled by GameWindow.

  - o **Start Date:** March 26, 2025

  - o **End Date:** March 28, 2025

  - o **Estimated Time:** 2 hours

- Integration Testing of UI Flow

  - o **Task:** Simulate game launch from the main menu. Verify that CONNECT4 UI elements (board layout, drop buttons) appear and function properly in GameWindow.

  - o **Start Date:** March 28, 2025

  - o **End Date:** March 30, 2025

  - o **Estimated Time:** 3 hours

- Bug Fixing and Refinements

  - o **Task:** Address integration issues (e.g., incorrect game title, event mishandling) based on test feedback.

  - o **Start Date:** March 31, 2025

- o **End Date:** April 1, 2025
- o **Estimated Time:** 2 hours

Milestones:

- Integration Complete: April 1, 2025

Phase 4: Testing

- **Duration:** April 2, 2025 – April 7, 2025
- **Goal:** Thoroughly test the CONNECT4 game module both in isolation and integrated within the main GUI.

Task List:

- Write Unit Tests for ConnectFourBoard

  - o **Start Date:** April 2, 2025
  - o **End Date:** April 3, 2025
  - o **Estimated Time:** 3 hours

- Write Unit Tests for ConnectFourGame

  - o **Start Date:** April 4, 2025
  - o **End Date:** April 5, 2025
  - o **Estimated Time:** 3 hours

- Conduct Integration Tests with GameWindow

  - o **Start Date:** April 6, 2025
  - o **End Date:** April 7, 2025
  - o **Estimated Time:** 3 hours

- Bug Fixing

  - o **Start Date:** April 7, 2025
  - o **End Date:** April 7, 2025
  - o **Estimated Time:** 2 hours

Milestones:

- Testing Complete: April 7, 2025

Phase 5: Review

- **Duration:** April 7, 2025 – April 11, 2025

- **Goal:** Finalize code, update documentation, complete final submission.

Task List:

- Update Documentation

    o **Start Date:** April 9, 2025

    o **End Date:** April 9, 2025

    o **Estimated Time:** 2 hours

- Full Code Review

    o **Start Date:** April 9, 2025

    o **End Date:** April 10, 2025

    o **Estimated Time:** 3 hours

- Record Video Demonstration

    o **Start Date:** April 9, 2025

    o **End Date:** April 10, 2025

    o **Estimated Time:** 3 hours

- Submit Documents

    o **Start Date:** April 10, 2025

    o **End Date:** April 11, 2025

    o **Estimated Time:** 1 hour

Milestones:

- Submission: April 11, 2025

Final Notes

We will start coding on March 8, 2025. Weekly meetings with other team leaders will be conducted to align working on different features. Scrum meetings will be held within sub-teams. Branch early and branch often and commit frequently to GitLab.