Comprehensive Exercise Report

Team <<X>> of Section <<000>>

<<Group Member names and unity IDs>>

NOTE: You will replace all placeholders that are given in <<>>

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# Requirements/Analysis

Week 2

## Journal

The following prompts are meant to aid your thought process as you complete the requirements/analysis portion of this exercise. Please respond to each of the prompts below and feel free to add additional notes.

* After reading the client’s brief (possibly incomplete description), write one sentence that describes the project (expected software) and list the already known requirements.
  + <<Insert one sentence description>>
    - <<Insert known requirements from client description, add more bullets as needed>>
* After reading the client’s brief (possibly incomplete description), what questions do you have for the client? Are there any pieces that are unclear? After you have a list of questions, raise your hand and ask the client (your instructor) the questions; make sure to document his/her answers.
  + <<Insert your questions and your instructor’s answers>>
* Does the project cover topics you are unfamiliar with? If so, look up the topics and list your references.
  + <<Insert answer>>
* Describe the users of this software (e.g., small child, high school teacher who is taking attendance).
  + <<Insert answers>>
* Describe how each user would interact with the software
  + <<Insert answer>>
* What features must the software have? What should the users be able to do?
  + <<Insert answer>>
* Other notes:
  + <<Insert notes>>

**Journal**

* After reading the client's brief, the project is a Connect 4 game software that provides a two-player experience where users take turns placing colored discs on a vertically standing board with the objective of connecting four of their colored pieces horizontally, vertically, or diagonally. The known requirements include:

1. The game should have a graphical user interface (GUI) that is easy to use and visually appealing.
2. The game should support two players taking turns to play the game.
3. The game should display the current state of the game and indicate which player's turn it is.
4. The game should check for a winner or a tie and display the result.
5. The game should allow players to start a new game after the current game ends.

* The questions that need to be addressed to the client are:

1. Will the software have an AI opponent mode where the user can play against the computer?
2. Will the software allow users to save and load previous games?
3. Will the software include sound effects and animations to enhance the gameplay experience?

* The project will cover topics that are familiar, such as programming in Python, but some research may be required to implement specific features, such as sound effects and animations.
* The users of this software are people who enjoy playing Connect 4, including children and adults. The software should be accessible to all users, regardless of their skill level or age.
* Each user will interact with the software by taking turns placing their colored pieces on the board and watching the game's progress. The software should have an intuitive and visually appealing GUI that includes clear game instructions, graphics, and sound effects.
* Some of the features that the software should have include:

1. Ability to display the Connect 4 game board
2. Allow two players to take turns dropping their respective game pieces into the board
3. Detect when a player has won or when the game has resulted in a tie
4. Allow players to start a new game after a game has ended
5. Provide an option for players to quit the game at any point.

* As for what users should be able to do, they should be able to interact with the game in order to play. This includes selecting where they want to place their game piece on the board, seeing the current state of the board at all times, and receiving feedback when the game has ended. The game should also be easy to understand and follow for players of all ages and skill levels.
* Other notes:

It would be beneficial to include a single-player mode with an AI opponent for added replay ability. The game could potentially have different themes or modes that can be selected by the user.

## Software Requirements

<<Use your notes from above to complete this section of the formal documentation by writing a detailed description of the project, including a paragraph overview of the project followed by a list of requirements (see lecture for format of requirements). You may also choose to include user stories.>>

* Software Requirements

The software must have the following features:

1. The game board must have a minimum size of 7 rows by 6 columns.
2. The game must have a two-player mode.
3. The game should allow two players to take turns dropping their pieces onto the board.
4. The game should check for a winner or a tie condition after each move and display the result.
5. The game should have a restart button that allows players to start a new game after a win or tie condition.

* User stories:

1. As a player, I want to be able to place my colored pieces on the game board.
2. As a player, I want to know who wins the game.
3. As a player, I want to be able to start a new game after a win or tie condition.
4. As a player, I want to be able to quit the game.

# Black-Box Testing

Instructions: Week 4

## Journal

***Remember:*** Black box tests should only be based on your requirements and should work independent of design.

The following prompts are meant to aid your thought process as you complete the black box testing portion of this exercise. Please review your list of requirements and respond to each of the prompts below. Feel free to add additional notes.

* What does input for the software look like (e.g., what type of data, how many pieces of data)?
  + <<Insert answer>>
* What does output for the software look like (e.g., what type of data, how many pieces of data)?
  + <<Insert answer>>
* What equivalence classes can the input be broken into?
  + <<Insert answer>>
* What boundary values exist for the input?
  + <<Insert answer>>
* Are there other cases that must be tested to test all requirements?
  + <<Insert answer>>
* Other notes:
  + <<Insert notes>>

## Black-box Test Cases

Use your notes from above to complete the black-box test plan section of the formal documentation by writing black box test cases (other than actual results since no program currently exists). Remember to test each equivalence class, boundary value, and requirement.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test ID** | **Description** | **Expected Results** | **Actual Results** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Design

Instructions: Week 6

## Journal

***Remember:*** You still will not be writing code at this point in the process.

The following prompts are meant to aid your thought process as you complete the design portion of this exercise. Please respond to each of the prompts below and feel free to add additional notes.

* List the nouns from your requirements/analysis documentation.
  + <<Insert answer>>
* Which nouns potentially may represent a class in your design?
  + <<Insert answer>>
* Which nouns potentially may represent attributes/fields in your design? Also list the class each attribute/field would be a part of.
  + <<Insert answer>>
* Now that you have a list of possible classes, consider different design options (***lists of classes and attributes***) along with the pros and cons of each. We often do not come up with the best design on our first attempt. Also consider whether any needed classes are missing. These two design options should not be GUI vs. non-GUI; instead you need to include the classes and attributes for each design. Reminder: Each design must include at least two classes that define object types.
  + <<List at least two design options with pros and cons of each>>
* Which design do you plan to use? Explain why you have chosen this design.
* List the verbs from your requirements/analysis documentation.
  + <<Insert answer>>
* Which verbs potentially may represent a method in your design? Also list the class each method would be part of.
  + <<Insert answer>>
* Other notes:
  + <<Insert notes>>

## Software Design

<<Use your notes from above to complete this section of the formal documentation by planning the classes, methods, and fields that will used in the software. Your design should include UML class diagrams along with method headers. ***Prior to starting the formal documentation, you should show your answers to the above prompts to your instructor.****>>*

# Implementation

Instructions: Week 8

## Journal

The following prompts are meant to aid your thought process as you complete the implementation portion of this exercise. Please respond to each of the prompt below and feel free to add additional notes.

* What programming concepts from the course will you need to implement your design? Briefly explain how each will be used during implementation.
  + <<Insert answer>>
* Other notes:
  + <<Insert notes>>

## Implementation Details

<<Use your notes from above to write code and complete this section of the formal documentation with a README for the user that explains how he/she will interact with the system.>>

# Testing

Instructions: Week 10

## Journal

The following prompts are meant to aid your thought process as you complete the testing portion of this exercise. Please respond to each of the prompts below and feel free to add additional notes.

* Have you changed any requirements since you completed the black box test plan? If so, list changes below and update your black-box test plan appropriately.
  + <<Insert answer>>
* List the classes of your implementation. For each class, list equivalence classes, boundary values, and paths through code that you should test.
  + <<Insert class>>
    - <<Insert needed tests>>
  + <<Insert class and tests for each class>>
* Other notes:
  + <<Insert notes>>

## 

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## Testing Details

<<Use your notes from above to write your test programs and complete this section of the formal documentation by creating a list of your test programs along with descriptions of what they are testing. You will also complete the black-box test plan by running the program and filling in the Actual Results column.>>

# Presentation

Instructions:Week 12

## Preparation

The following prompts are meant to aid your thought process as you complete the presentation portion of this exercise. It is recommended that you examine the previous sections of the journal and your reflections as you work on the presentation as it is likely that you have already answered some of the following prompts elsewhere. Please respond to each of the prompts below and feel free to add additional notes.

* Give a brief description of your final project
  + <<Insert answer>>
* Describe your requirement assumptions/additions.
  + <<Insert answer>>
* Describe your design options and decision. How did you weigh the pros and cons of the different designs to make your decision?
  + <<Insert answer>>
* How did the extension affect your design?
  + <<Insert answer>>
* Describe your tests (e.g., what you tested, equivalence classes).
  + <<Insert answer>>
* What lessons did you learn from the comprehensive exercise (i.e., programming concepts, software process)?
  + <<Insert answer>>
* What functionalities are you going to demo?
  + <<Insert answer>>
* Who is going to speak about each portion of your presentation? (Recall: Each group will have ten minutes to present their work; minimum length of group presentation is seven minutes. Each student must present for at least two minutes of the presentation.)
  + <<Insert answer>>
* Other notes:
  + <<Insert notes>>

<<Use your notes from above to complete create your slides and plan your presentation and demo.>>