Comprehensive Exercise Report

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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.

Known Requirements:

1.The software should implement the rules of the Connect 4 game.

2.Users should be able to choose their color (yellow or red) before starting the game.

3.The game board should be displayed with 6 rows and 7 columns.

4.Players should take turns entering their moves by selecting a column to drop their disc.

* 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.

Questions for the Client/Instructor:

1.Are there any specific user interface requirements or preferences for the physical version of the Connect 4 game?

2.Should the software include any additional features or customization options beyond the standard Connect 4 rules?

3.Are there any specific performance or efficiency considerations for the software implementation?

4.Is there a preferred method for handling user input validation or error handling during gameplay?

Client/Instructor Answers:

1.The physical version should closely resemble the traditional Connect 4 game board with slots for dropping discs.

2.The software should stick to the classic rules of Connect 4 without additional features.

3.Efficiency is not a primary concern, but the software should be reasonably optimized for smooth gameplay.

4.Basic input validation should be implemented to handle invalid moves gracefully.

* Does the project cover topics you are unfamiliar with? If so, look up the topics and list your references.  
   Answer :No .
* Describe the users of this software (e.g., small child, high school teacher who is taking attendance).

1.Players interested in engaging in strategic gameplay.

2.Individuals looking for a fun and interactive way to develop critical thinking skills.

* Describe how each user would interact with the software

1.Users will interact with the software by running the connect4.py script in a Python environment.

2.They will choose their color (yellow or red) before starting the game.

3.Players will take turns entering their moves by selecting a column to drop their disc on the game board.

4.The game will continue until a player wins or the board is filled.

* What features must the software have? What should the users be able to do?

1.Implementation of standard Connect 4 game rules.

2.User selection of color before starting the game.

3.Display of the game board with 6 rows and 7 columns.

4.Turn-based gameplay where players drop discs into columns.

5.Detection of winning conditions (four discs in a row, column, or diagonal) or a tie game.

6.Announcement of the winner or indication of a tie game.

## Software Requirements

The Connect 4 game project aims to develop software for playing the classic strategy board game. Users can choose their color (yellow or red) and take turns dropping discs onto a 6x7 grid. The game continues until one player achieves a winning condition or the board is filled resulting in a tie.

Software Requirements:

Initialization:   
1.Display the game board with 6 rows and 7 columns.

2.Allow users to select their color before starting the game.

Gameplay:

1.Players take turns entering moves by selecting a column to drop their disc.

2.Validate user inputs to ensure they correspond to valid columns.

3.End the game when a winning condition is met or the board is filled.

Winning Conditions:

1.Detect and announce when a player connects four discs in a row, column, or diagonal.

Tie Game Handling:

1.Detect when all slots on the game board are filled without a winning condition.

2.Announce a tie game and end the game.

User Interface:

1.Provide a user-friendly interface for making moves.

2.Ensure the game board is visually clear and appealing.

Error Handling:

3.Handle invalid user inputs gracefully with appropriate error messages.

# 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.>>