CSCI1020 Hands-on Introduction to C++ (2022-2023 Term 2)

Project

Deadline: 30-Apr-2023 (Sun) 23:59

In this project, your task is to implement an SOS game for one or two human players. If there is only one human player, another player is the computer player.

Part 1 [40%]

In Part 1, the two players take turns in placing an S mark or an O mark on an empty square of a 3x3 board. The player can choose freely which mark to place without any limitation. The first player who can achieve an SOS in a horizontal, a vertical, or a diagonal row on the board is the winner. If no one wins after the board is full, it is a draw game.

You are required to complete the given **ProjectPart1.cpp** without modifying the existing code nor any given member function/constructor headers. You are also required to use encapsulation, inheritance, overriding, polymorphism, and information hiding.

Please study the given source code, the comments inside, and the sample runs for the program design and the required features.

The assessment scheme for Part 1 is shown as follows:

- Correctness [60%]
- Class Design [40%]
    - Program Readability (e.g., comments, meaningful identifiers)
    - Encapsulation
    - Inheritance
    - Overriding
    - Polymorphism
    - Information hiding

Part 2 [40%]

In Part 2, your task is to design and implement additional features to Part 1, such as larger game board, invalid input checking, improved computer AI, etc.

Please make sure your source code in Part 2 can be compiled and executed without the source code in Part 1. You can modify our given existing code in **ProjectPart1.cpp** or add new content (e.g., member variables, member functions, constructors, classes, etc.)**.** If necessary, you can also use the techniques or the libraries that are not covered in the lectures. But you will need to make sure your code works in Visual Studio 2022 under Windows 10, which is our testing platform.

In additional to the source code, please submit a report (in PDF) that consists of the following items:

1. For each additional features in Part 2
    a. The explanation of the feature
    b. Sample runs (similar to those in our lab specifications)
    c. The source code segment related to this feature
2. The techniques or the libraries used in Part 2 that are not covered in the lectures.
3. References (must be included if you have used any idea or techniques from others, such as from reference books or Internet)

We will do the grading and test the correctness of the source code based on the features you mentioned in the report. You are required to provide sufficient information in details to facilitate the grading. No marks will be given if you implemented a feature in the source code without mentioning it in the report.

If the features claimed in the report can only be barely used (e.g., with a lot of bugs) or even do not exist in the source code, marks will be deducted.

In the report, there is no need to mention anything in Part 1. There is no format or page limit.

Grading will be based on the correctness, the design, the creativity, the usefulness, and the implementation difficulties of the additional features, and also the materials that you have submitted.

Note that the source code in this part will affect the content of the presentation video (see later for details).

As the University requirement, you are required to submit the report (not the source code files) to VeriGuide for checking. Please submit the VeriGuide receipt to us afterwards.

Presentation Video [20%]

In this part, your task is to prepare a presentation video to explain your code written in Part 2. The objective is to let you show us your understanding in C++.

Grading will be based on the programming techniques introduced (quantity and difficulty), the presentation skill, and the video quality. You are only required to present the technical aspects. There is no need to present how good the implemented features are (i.e., the presentation is not like selling a software product).

Here are the video requirements:

1. Maximum video length: 10 minutes
2. Include your name and student ID in the beginning of the video
3. The presentation must be done in English and in your own voice
4. Include captions/subtitles throughout the video
5. Include a reference section at the end (if applicable)
6. Tools for video creation and editing
    - Zoom
    - Microsoft Photos app
    - Apple iMovie
    - LightWorks
    - Any desktop recording software or any other tools
7. Convert the video to a compressed format with smaller size (e.g., mp4) for uploading

Declaration

Please complete and place the following declaration statement as the comment in the beginning of every source code.

```
/**************************************************************************
CSCI1020 Hands-on Introduction to C++

I declare that the source code here submitted is original except for source
material explicitly acknowledged. I also acknowledge that I am aware of
University policy and regulations on honesty in academic work, and of the
disciplinary guidelines and procedures applicable to breaches of such
policy and regulations, as contained in the following University website:
https://www.cuhk.edu.hk/policy/academichonesty/

Student Name: <your name>
Student ID: <your student ID>
Date: <date>
**************************************************************************/
```

Submission

1. For Part 1:
    a. Rename **ProjectPart1.cpp** to **<your student ID>_ProjectPart1.cpp**, where <your student ID> should be replaced by your own student ID (e.g., 1155012345_ ProjectPart1.cpp).
    b. Go to https://blackboard.cuhk.edu.hk and login your account.
    c. Go to CSCI1020 → Project → Project Part 1 Submission.
    d. Submit the cpp file.
2. For Part 2:
    a. Name the source code for Part 2 as **<your student ID>_ProjectPart2.cpp**, where <your student ID> should be replaced by your own student ID (e.g., 1155012345_ ProjectPart2.cpp).
    b. Convert your report to PDF format, and name it as **<your student ID>_Report.pdf**, where <your student ID> should be replaced by your own student ID (e.g., 1155012345_ Report.pdf).
    c. Go to https://blackboard.cuhk.edu.hk and login your account.
    d. Go to CSCI1020 → Project → Project Part 2 Submission.
    e. Submit the following files:
        i. **<your student ID>_ProjectPart2.cpp**
        ii. **<your student ID>_Report.pdf**
        iii. VeriGuide receipt of the report
3. For Presentation Video:
    a. Convert the video to a compressed format with smaller size (e.g., mp4).
    b. Name the video as **<your_student_id>_Video.mp4**, where <your_student_id> should be replaced by your student ID (e.g., 1155012345_Video.mp4).
    c. Go to https://blackboard.cuhk.edu.hk and login your account.
    d. Go to the page for CSCI1020 → Panopto Video → Project Video Submission (above all videos, with a small folder icon) → Create → Upload media.
    e. Upload your video.

Resubmissions are allowed. But only the latest one will be counted. Late submissions within three days can only receive 70% of the marks. Late submissions more than three days will not be graded.