CONNECT 4

Timelines:

- **November 28th, 2022**
    - First Team Meet Up (Setting up leads/roles)
    - "StatementofWork.doc" completed
- **December 3rd, 2022**
    - **Nick** finished the **Board.h** and **Board.cpp**
- **December 4th, 2022**
    - Second Team Meet Up (Who is in charge of making the files)
    - **Steven** is in charge of **main.cpp**
    - **Danny** and **Matthew** are in charge of player file
    - **Sebastian** is in charge of making graphics file
    - **Nick** is in charge of creating the board and checking conditions
    - **Zhilang** going around to help with the coding or reports
- **December 6th, 2022**
    - **Sebastian** finished **Visual.h** and **Visual.cpp**
- **December 7th, 2022**
    - Third Team Meet Up **(**Checking in)
    - **Matthew** finished the **Player.h** and **Player.cpp**
- **December 8th, 2022**
    - **Steven** finished the logical pseudo coding in **main.cpp**
- **December 9th, 2022**
    - Fourth Team Meet Up (Putting everything together)
    - **Danny** helped film and edit the video for the project

Objectives:

The objective of this project is to create a Connect-4 game with only using C++ programming language. For starters, Connect-4 is a 2-player board game with a size of 6 rows and 7 columns. Each player takes turns dropping their piece in one of the 7 columns. The winner is decided if one of the sides makes a 4 in a row. It can be horizontal (----), vertical (|), positive diagonal (/) or negative diagonal (\ ). However, if both sides are unable to make a move once the board has 42 pieces and there is no 4 in a row, it is considered a draw. With our game we would like to add in the option to make the opponent a computer as well with varying levels of difficulty.

Outside of programming:

- **The whole team meets up in one place prepping for the project**
- **Once we finish the objectives below and have everything we need, let's meet up and work together to put all in one place**

Anything in red text is optional if we want to make connect-4 interesting.

I'll set up each part we need to complete the project (Everyone is allowed to program).

- **One of us creates a GitHub link for all of us to post our code**
- **Create a game board of Connect-4/A Display( ) function**
    - It's up to you to decide what the board should look like
- **Create a function that checks the endgame conditions:**
    - If one of the sides got a 4 in a row
        - horizontal (----)
        - vertical (|)
        - positive diagonal (/)
        - negative diagonal (\ )
    - If the game is a draw
        - If the board == 42 pieces
        - Should have a counter for how many pieces, in total, dropped
    - Display who is the winner, otherwise display draw
- **Create a display on the console**
    - Title: "Welcome to Connect 4!"
- **Prompting players**
    - Each player will provide their names
    - Each player will have their own piece
        - Player 1 is "X"

    - Player 2 is “O”
    - We can randomize who can go first. If not, then Player 1 will always go first.
    - If we want to get more interesting, we can add picture of the pieces
- **Create a function that keeps track of the score (amount of wins) for each player**
- **Create a function that reset the board if prompted to play again, otherwise terminate the program.**
- **Create computer player**
  - **Will be a class with member functions**
  - **Need a member function to “read” the board and determine wether any moves will win the game outright**
    - **No matter if they are reachable or not**
    - **If reachable for computer player they will do that move and either win or block you from winning**
    - **If not reachable the computer will avoid**
  - **Another function to analyze moves that will not win but advance play**
    - **Attach values to each move**
    - **Ex +0 for moves that give 1 in a row, +200 for 2 in a row, +400 for 3 in a row**
    - **Program will always select the highest value move**
      - **If 2 are the same value it will select at random**
- **Will culminate in an engaging youtube video demonstrating our game with the “World Cup of Connect 4” where we will compete against each other to demonstrate the functionality of our output and how we used class concepts to develop our program. This video will verify that all the objectives outlined above were achieved.**
- **Create restart function**
  - **Two commands Y for Yes and N for NO.**
  - **If YES, restart the game.**
  - **If NO, printout goodbye.**

In-Person Meetings:

- Preliminary/First Meeting: **November 28, 2022**
- Second Meeting: **December 4, 2022**
- Third Meeting: **December 7, 2022**
- Fourth Meeting: **December 9, 2022**
- Final Meeting (Video Filming): **December 9, 2022**