

Assignment

by Kieran John Ayres

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School of Computing

Mathematics for Software Development

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Mathematics/ACDA4003

Introduction

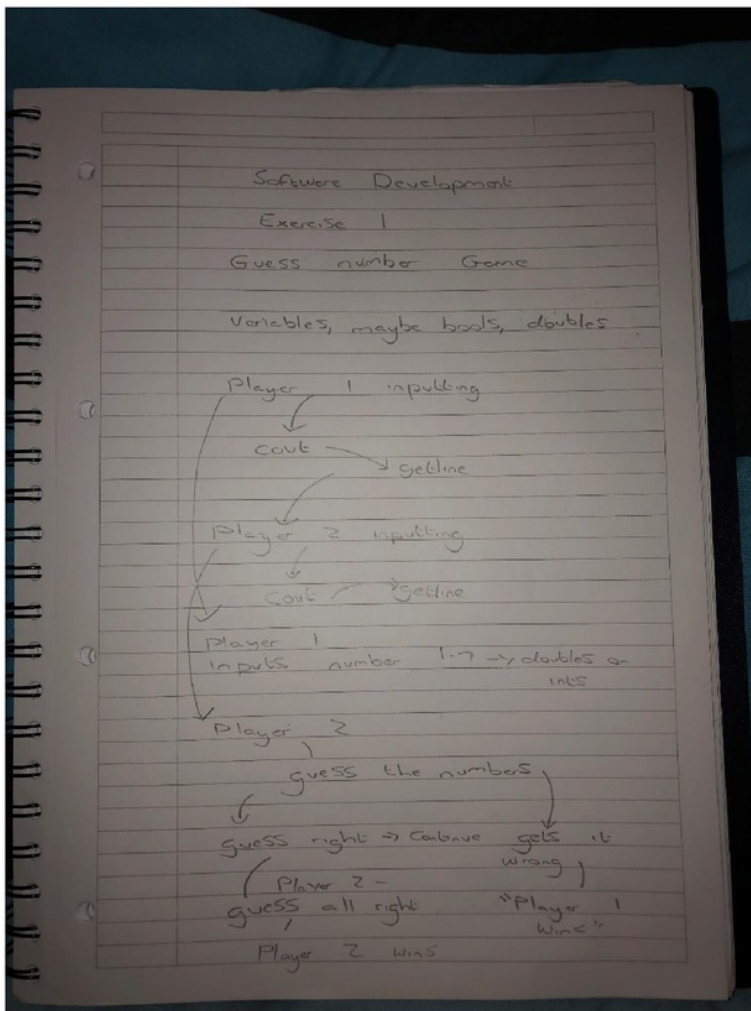
The focal point of this assignment is to prove mathematical theory. The reason this is being proved so it can be shown.

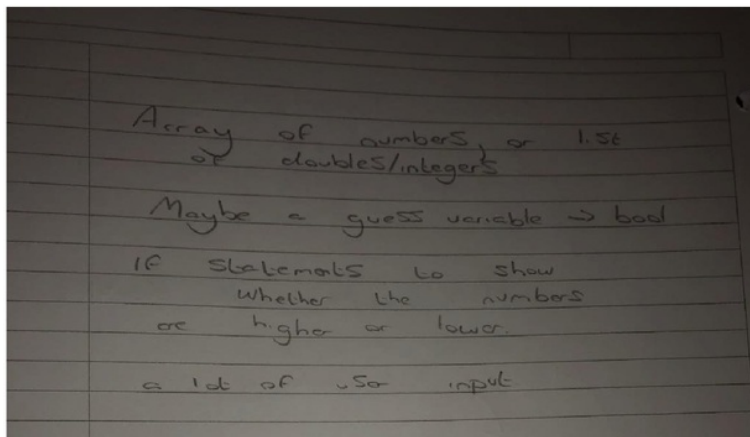
Introduction

The focal point of this assignment is to program the exercises given, while doing this there will be test scheduling, to show the process of testing the exercises. These will also be listed into the list of difficulty to code, these exercises will also be accompanied by diagrams that were drawn to show the development process for the programs.

1. Exercise 1

Here is the diagram, this is what the designer used to get an idea on how to design the program, this works as a basic diagram as an outline of what to follow in the process of writing the code. This is a way of giving an idea to follow before going forward and trying to do the code





These are also some written notes of the methods identified to use when writing the program.

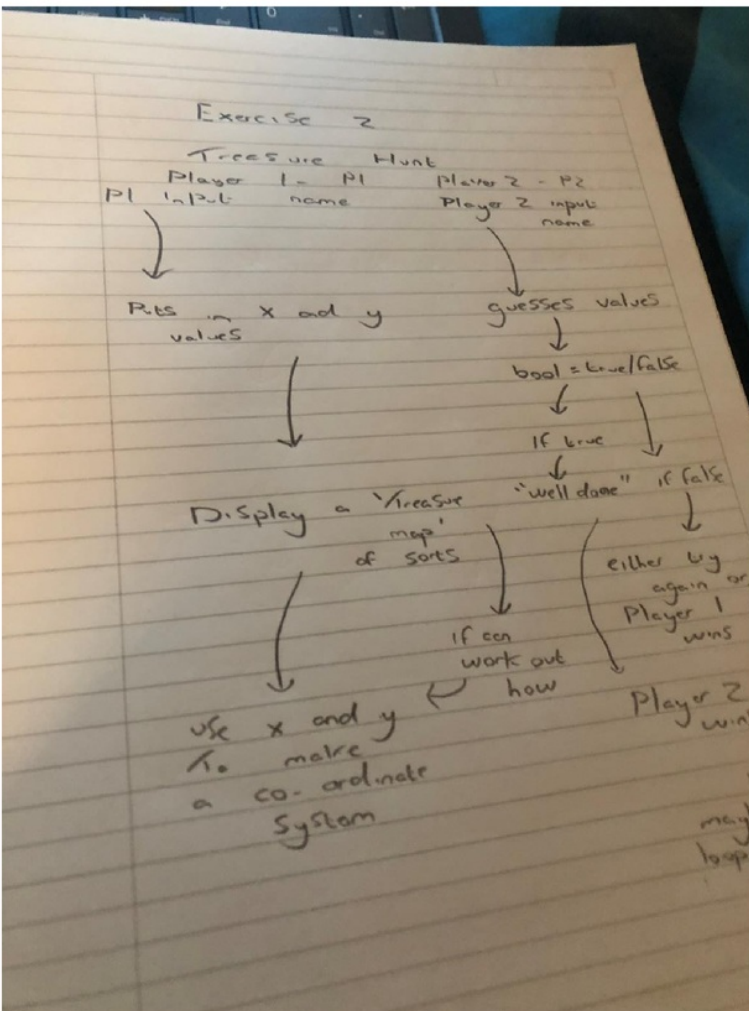
This is the program running:

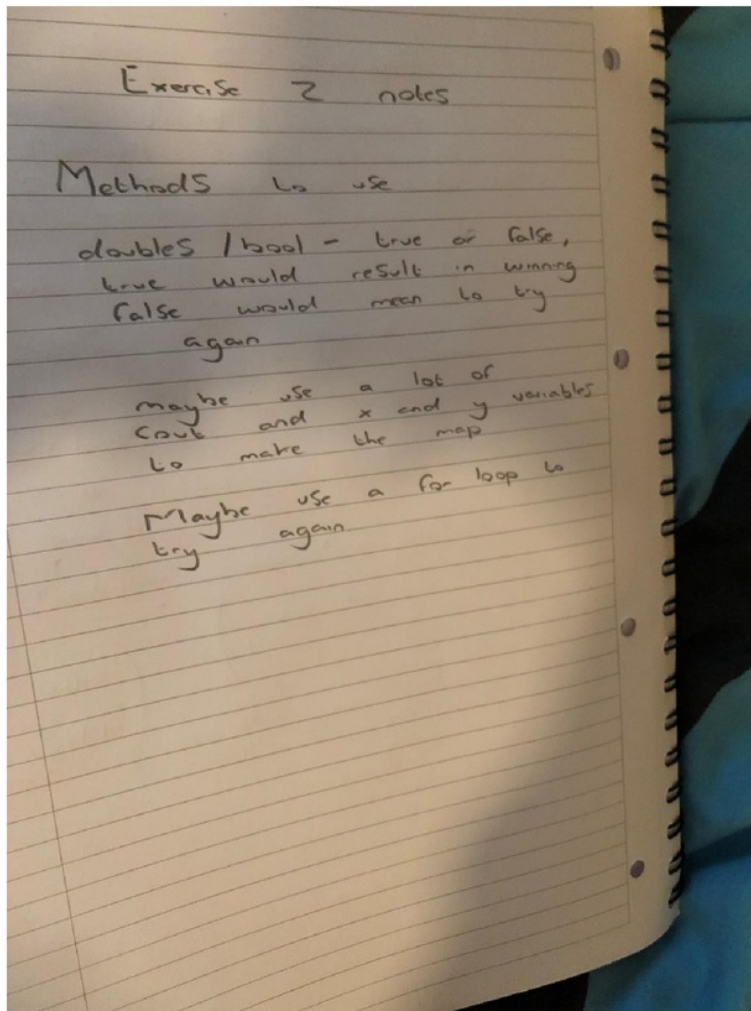
The screenshot displays the Visual Studio IDE with the following components:

- Source Code:** A C++ program snippet showing a loop where two numbers are compared. The code includes prompts for Player 1 and Player 2, and logic to determine if one number is higher or lower than the other.
- Output:** The program's execution output, showing prompts like "Please enter the next number:" and game status updates such as "Player 2, please guess the numbers entered by Player 1" and "The first value is : 1".
- Autos:** A table showing the current state of variables, including "Name", "Value", and "Type".

2. Exercise 2

This one was more challenging, it required more programming methods to be used and there was an idea for it to have a display with a map, so this was a challenging process. The two images below show a diagram to show an outline process of how the program may go, some written notes identifying possible methods to use.





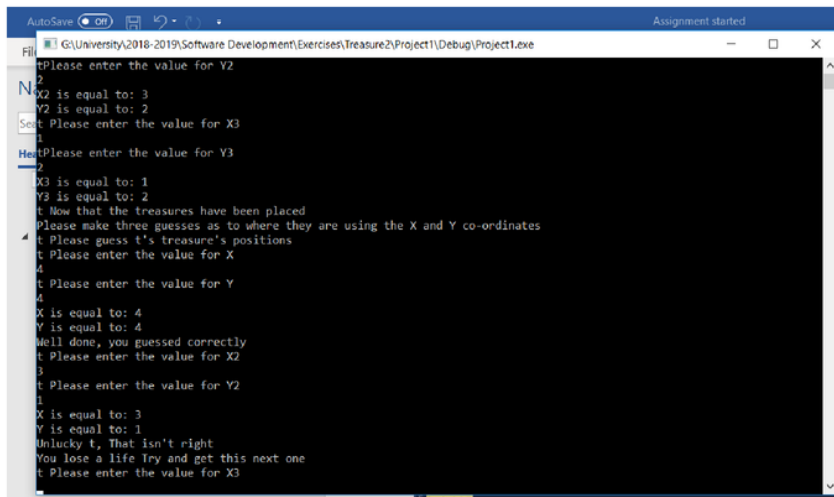
The next screenshot is to show some of the development process that the program went through. This is to show that one of the first methods had been implemented, the following image shows the program running with the loop:

```
Player 1, please enter your name:
Kieran
Player 2, please enter your name:
Carly
Please enter the value for X
5
Please enter the value for Y
4
X is equal to: 5
Y is equal to: 4
Please enter the value for X
5
Please enter the value for Y
2
X is equal to: 3
Y is equal to: 2
Please enter the value for X
5
Please enter the value for Y
7
X is equal to: 5
Y is equal to: 7
Now that the treasures have been placed
```

Upon doing this, the designer realised that this wasn't practical, because by having a loop, it stopped the user being able to guess, the accurate values. Instead they reverted-back to using the same block of code three times and changing the variables where appropriate.

These are the basics of the program running

```
Y2 is equal to: 4
Kieran Please enter the value for X3
3
KieranPlease enter the value for Y3
2
X3 is equal to: 3
Y3 is equal to: 2
Carly Now that the treasures have been placed
Please make three guesses as to where they are using the X and Y co-ordinates
Carly Please guess Kieran's treasure's positions
Carly Please enter the value for X
5
Carly Please enter the value for Y
2
X is equal to: 5
Y is equal to: 2
Well done, you guessed correctly
Carly Please enter the value for X2
1
Carly Please enter the value for Y2
3
X is equal to: 1
Y is equal to: 3
Carly Please enter the value for X3
1
Carly Please enter the value for Y3
5
Y is equal to: 1
X is equal to: 5
```



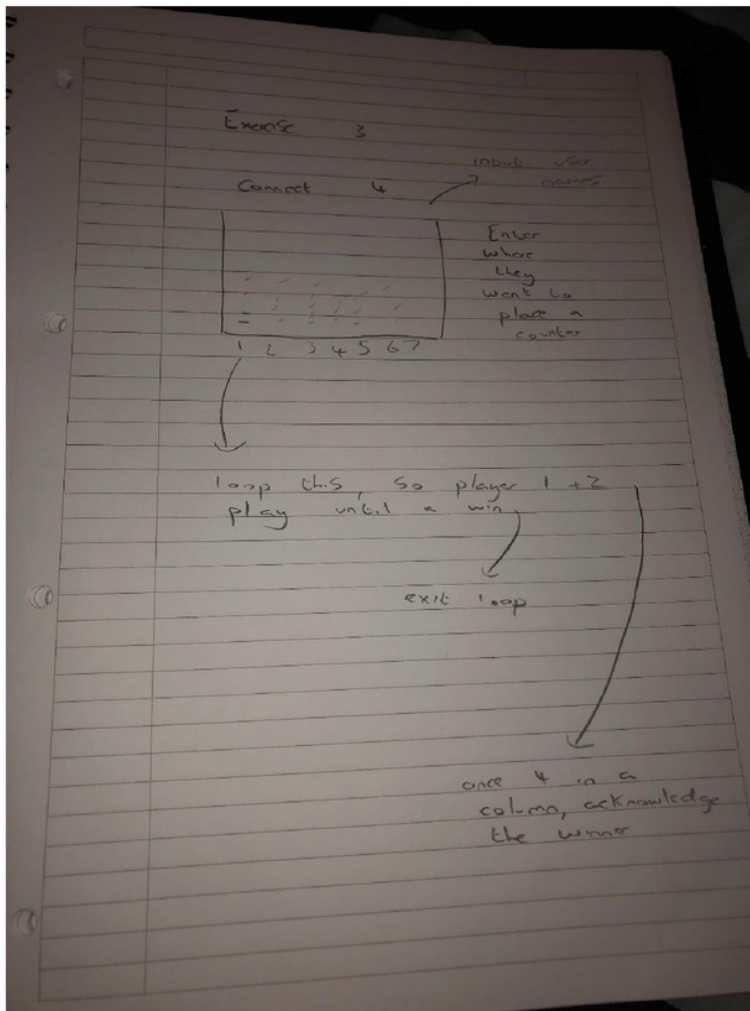
```
AutoSave  GO  Assignment started
G:\University\2018-2019\Software Development\Exercises\Treasure2\Project1\Debug\Project1.exe
Please enter the value for Y2
2
X2 is equal to: 3
Y2 is equal to: 2
Please enter the value for X3
1
Please enter the value for Y3
2
X3 is equal to: 1
Y3 is equal to: 2
Now that the treasures have been placed
Please make three guesses as to where they are using the X and Y co-ordinates
Please guess t's treasure's positions
Please enter the value for X
4
Please enter the value for Y
4
X is equal to: 4
Y is equal to: 4
Well done, you guessed correctly
Please enter the value for X2
3
Please enter the value for Y2
1
X is equal to: 3
Y is equal to: 1
Unlucky t, That isn't right
You lose a life Try and get this next one
Please enter the value for X3
```

This is a rough draft of the game to show before adding the more interesting things such as the life system or the grid.

3. Exercise 3

This exercise was by far the most challenging, it required a loop until the game finished, it needed a lay out to mirror that of the game, connect 4.

Here is an image of a rough draw/diagram of the game



4. List of Difficulty to Code

The following exercises have been listed easiest to hardest, they were all challenging, here's how they were ranked:

1. Exercise 3
2. Exercise 1
3. Exercise 3

5. Test Schedule

Test Number	Description	Expected Result	Expected Outcome	Pass/Fail
1	Exercise 1, Player 1 can input all the numbers	Inputs Correctly	As, expected	Pass
2	Exercise 1, program runs	Runs smoothly	Didn't run	Fail
3	Exercise 1, lets player 1 win	Runs smoothly	As, expected	Pass
4	Exercise 2, test the for loop	The loop goes around 3 times	As, expected	Pass
6	Exercise 2, player 1 enters values	Enters values, program continues	As, expected	Pass
7	Exercise 2, player 2 guesses some values correctly	Program acknowledges that they were right	As, expected	Pass
8	Exercise 2, shows that if you guess it wrong it will acknowledge it	Acknowledges it was wrong	As, expected	Pass

Test 1

As you can see from this, player 1 can input all, of the numbers

```

This is a two player game, Player 1 will take their turn
Hint, use numbers between 1 and 9
Please enter 7 numbers:
Please enter the first number:
2
Please enter the second number:
6
Please enter the next number:
5
Please enter the next number:
3
Please enter the next number:
7
Please enter the next number:
8
Please enter the next number:
3
Player 2, please guess the numbers entered by Player 1
The first value is :2
Please guess a number higher or lower:

```

Test 2

The second test didn't run as smoothly as originally intended, the value of the first array is returning as a decimal point number. Another fault that is worth mentioning is that there was a mistake, one of the guess number features were at the start by accident.

```

This is a two player game, Player 1 will take their turn
Hint, use numbers between 1 and 9
Please enter 7 numbers:
Please enter the first number:
1
Please enter the second number:
1
Please enter the next number:
1
Please enter the next number:
1
Please enter the next number:
1
Please enter the next number:
1
Please enter the next number:
1
Player 2, please guess the numbers entered by Player 1
To make it easier, you can guess higher or lower, use the characters h(Higher) or l(Lower)
The first value is :0.58993460
Please guess higher or lower:
This is incorrect, player 1 wins:
Please guess the third number:
The value is higher than the number, the value is :0.58993460Please guess the next number:
The value is higher than the number, the value is :0.58993460Please guess the next number:

```

```

121 stream_str(input);
122 stream << numbers;
123 numbers[3];
124
125 if (guess == numbers[3])
126 {
127     cout << "Well done, the value is" << numbers[3];
128 }
129 else
130 {
131     cout << "This is incorrect, player 1 wins: " << endl;
132 }
133
134 cout << "Please guess the next number: " << endl;
135
136 getline(cin, input);
137 stream_str(input);
138 stream << numbers;
139 numbers[4];
140
141 if (guess == numbers[4])
142 {
143     cout << "Well done, the value is" << numbers[4];
144 }
145 else
146 {
147     cout << "This is incorrect, player 1 wins: " << endl;
148 }
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```

Code	Description	Project	File	Line	Severity
C4700	uninitialized local variable 'i' used	Project2	source1.cpp	21	Error
C4700	uninitialized local variable 'h' used	Project2	source1.cpp	27	Error
C4700	uninitialized local variable 'guess' used	Project2	source1.cpp	33	Error
C4700	uninitialized local variable 'choice' used	Project2	source.cpp	95	Error

This is the program, not running, this was due to the variables not initialising.

Test 3

This shows the program running smoothly and Player 1 wins when it is guessed wrong.

```

C:\Users\kayre\source\repos\Project5\Debug\Project5.exe
This is a two player game, Player 1 will take their turn
hint, use numbers between 1 and 9
Please enter 7 numbers:
Please enter the first number:
7
Please enter the second number:
4
Please enter the next number:
9
Please enter the next number:
3
Please enter the next number:
5
Please enter the next number:
7
Please enter the next number:
4
Please enter the next number:
3
Player 2, please guess the numbers entered by Player 1
The first value is :4
Please guess a number higher or lower:
5
The value is lower than the number, well done, the value is : 9
Please guess the third number:
3
This is incorrect, player 1 wins:

```

Test 6 and 7

```
Please enter the value for Y3
3 is equal to: 1
3 is equal to: 1
Now that the treasures have been placed
Please make three guesses as to where they are using the X and Y co-ordinates
Please guess k's treasure's positions
Please enter the value for X

Please enter the value for Y

is equal to: 4
is equal to: 4
Well done, you guessed correctly
Please enter the value for X2

Please enter the value for Y2

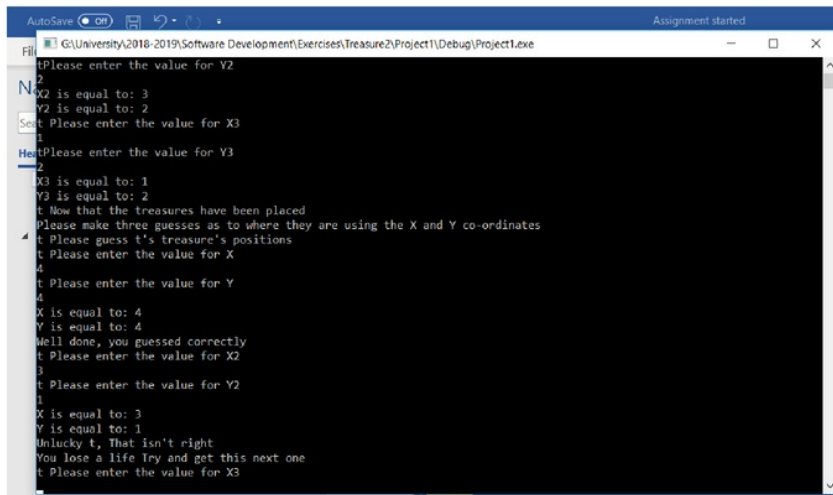
is equal to: 6
is equal to: 7
Well done, you guessed correctly
Unlucky c, That isn't right
You lose a life Try and get this next one
Please enter the value for X3

Please enter the value for Y3

is equal to: 2
is equal to: 1
```

Test 8

Showing that the program acknowledges if you have guessed wrong



```
AutoSave: ON | Assignment started
G:\University\2018-2019\Software Development\Exercises\Treasure2\Project1\Debug\Project1.exe
Please enter the value for Y2
2
X2 is equal to: 3
Y2 is equal to: 2
Please enter the value for X3
1
Please enter the value for Y3
2
X3 is equal to: 1
Y3 is equal to: 2
Now that the treasures have been placed
Please make three guesses as to where they are using the X and Y co-ordinates
Please guess t's treasure's positions
Please enter the value for X
4
Please enter the value for Y
4
X is equal to: 4
Y is equal to: 4
Well done, you guessed correctly
Please enter the value for X2
3
Please enter the value for Y2
1
X is equal to: 3
Y is equal to: 1
Unlucky t, That isn't right
You lose a life Try and get this next one
Please enter the value for X3
```

Shows values being entered from Player 1 and Player 2 then enters their values and the programme acknowledges this.

Conclusion

In conclusion, this assignment has been very challenging, it has challenged the engineer on how to persevere with their work, it has also taught them that they need thorough testing in every program that they write.

Appendices

Here is the code for Exercise 1

```
//exercsise 1

//libraries

#include <iostream>
#include <sstream>
#include <stdio.h>

using namespace std;

int main(int argc, char** argv)
{
    stringstream stream;
    string input = "";

    double num1, num2, num3, num4, num5, num6, num7, num8, num9, num10, num11,
    num12, num13;

    //game will start with having player 1 entering their 7 numbers
    cout << "This is a two player game, Player 1 will take their turn" << endl;
    cout << "Hint, use numbers between 1 and 9" << endl;
    cout << "Please enter 7 numbers: " << endl;

    cout << "Please enter the first number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num1;
    stream.clear();

    cout << "Please enter the second number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num2;
    stream.clear();

    cout << "Please enter the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num3;
    stream.clear();

    cout << "Please enter the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num4;
    stream.clear();
```

```

    cout << "Please enter the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num5;
    stream.clear();

    cout << "Please enter the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num6;
    stream.clear();

    cout << "Please enter the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num7;
    stream.clear();

    cout << "Player 2, please guess the numbers entered by Player 1" << endl;

    cout << "The first value is :" << num1 << endl;

    cout << "Please guess a number higher or lower: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num8;
    stream.clear();

    if (num8 < num2)
    {
        cout << "The value is lower than the number, well done, the value is : "
<< num2 << endl;
        {
            if (num8 > num2)
            {
                cout << "This is incorrect, player 1 wins: " << endl;
                exit;
            }
        }
    }

    cout << "Please guess the third number: " << endl;
    getline(cin, input);
    stream.str(input);
    stream >> num9;
    stream.clear();

    if (num9 > num3)
    {
        cout << "The value is higher than the number, the value is :" << num3 <<
endl;
    }
    else
    {
        cout << "This is incorrect, player 1 wins: " << endl;
    }

```

```

        exit;
    }

    cout << "Please guess the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num10;
    stream.clear();

    if (num10 > num4)
    {
        cout << "The value is higher than the number, the value is :" << num4 <<
endl;
    }
    else
    {
        cout << "This is incorrect, player 1 wins: " << endl;
        exit;
    }

    cout << "Please guess the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num11;
    stream.clear();

    if (num11 < num5)
    {
        cout << "Well done, the number is smaller, the value is" << num5 <<
endl;
    }
    else
    {
        cout << "This is incorrect, player 1 wins: " << endl;
        exit;
    }

    cout << "Please guess the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num12;
    stream.clear();

    if (num12 < num6)
    {
        cout << "Well done, the number is smaller, the value is: " << num6 <<
endl;
    }
    else
    {
        cout << "This is incorrect, player 1 wins: " << endl;
        exit;
    }

    cout << "Please guess the next number: " << endl;

    getline(cin, input);
    stream.str(input);
    stream >> num13;

```

```

        stream.clear();

        if (num13 > num7)
        {
            cout << "Well done, the value is higher, the value is: " << num7 <<
endl;
        }
        else
        {
            cout << "Player 2 wins" << endl;
        }

        if (num13 < num7)
        {
            cout << "Player 1 wins" << endl;
        }

        return 0;
    }
}

```

Here is the code for Exercise 2

```

#include<stdio.h>
#include<sstream>
#include<iostream>

using namespace std;

int main(int argc, char** argv)
{
    stringstream stream;
    string input = "";
    string player1;
    string player2;
    //the guessing process
    bool guess1 = true;
    bool guess2 = true;
    bool guess3 = true;
    int lives = 3;

    cout << "Player 1, please enter your name: " << endl;
    getline(cin, input);
    stream.str(input);
    stream >> player1;
    stream.clear();

    cout << "Player 2, please enter your name: " << endl;
    getline(cin, input);
    stream.str(input);
    stream >> player2;
    stream.clear();

    //if guess equals to true, player 2 wins, however if they don't, the x and y
    co-ordinates are marked off

    //X Co-Ordinates

```

```

cout << player1 << " Please enter the value for X" << endl;

double x;
getline(cin, input);
stream.str(input);
stream >> x;
stream.clear();
//please enter the co-ordinates for y
cout << player1 << "Please enter the value for Y" << endl;

double y;
getline(cin, input);
stream.str(input);
stream >> y;
stream.clear();

cout << "X is equal to: " << x << endl;
cout << "Y is equal to: " << y << endl;

cout << player1 << " Please enter the value for X2" << endl;

double x2;
getline(cin, input);
stream.str(input);
stream >> x2;
stream.clear();
//please enter the co-ordinates for y
cout << player1 << "Please enter the value for Y2" << endl;

double y2;
getline(cin, input);
stream.str(input);
stream >> y2;
stream.clear();

cout << "X2 is equal to: " << x2 << endl;
cout << "Y2 is equal to: " << y2 << endl;

cout << player1 << " Please enter the value for X3" << endl;

double x3;
getline(cin, input);
stream.str(input);
stream >> x3;
stream.clear();
//please enter the co-ordinates for y
cout << player1 << "Please enter the value for Y3" << endl;

double y3;
getline(cin, input);
stream.str(input);
stream >> y3;
stream.clear();

cout << "X3 is equal to: " << x3 << endl;
cout << "Y3 is equal to: " << y3 << endl;

cout << player2 << " Now that the treasures have been placed" << endl;
cout << "Please make three guesses as to where they are using the X and
Y co-ordinates" << endl;

```

```

        cout << player2 << " Please guess " << player1 << "'s treasure's
positions" << endl;

        cout << player2 << " Please enter the value for X" << endl;

        double x4;
        getline(cin, input);
        stream.str(input);
        stream >> x4;
        stream.clear();
        //please enter the co-ordinates for y
        cout << player2 << " Please enter the value for Y" << endl;

        double y4;
        getline(cin, input);
        stream.str(input);
        stream >> y4;
        stream.clear();

        cout << "X is equal to: " << x4 << endl;
        cout << "Y is equal to: " << y4 << endl;

        if (x4 == x)
        {
            if (y4 == y)
            {
                cout << "Well done, you guessed correctly" << endl;
            }
            else
            {
                cout << "Unlucky " << player2 << ", That isn't right" <<
endl;
                //life system, user loses a life
                lives - 1;
                cout << "You lose a life" << " Try and get this next one"
<< endl;
            }
        }

        cout << player2 << " Please enter the value for X2" << endl;

        double x5;
        getline(cin, input);
        stream.str(input);
        stream >> x5;
        stream.clear();
        //please enter the co-ordinates for y
        cout << player2 << " Please enter the value for Y2" << endl;

        double y5;
        getline(cin, input);
        stream.str(input);
        stream >> y5;
        stream.clear();

        cout << "X is equal to: " << x5 << endl;
        cout << "Y is equal to: " << y5 << endl;

        if (x5 == x2)
        {
            if (y5 == y2)

```

```

        {
            cout << "Well done, you guessed correctly" << endl;
        }
        else
        {
            cout << "Unlucky " << player2 << ", That isn't right" <<
endl;
            //life system, user loses a life
            lives - 1;
            cout << "You lose a life" << " Try and get this next one"
<< endl;
        }
    }

    cout << player2 << " Please enter the value for X3" << endl;

    double x6;
    getline(cin, input);
    stream.str(input);
    stream >> x6;
    stream.clear();
    //please enter the co-ordinates for y
    cout << player2 << " Please enter the value for Y3" << endl;

    double y6;
    getline(cin, input);
    stream.str(input);
    stream >> y6;
    stream.clear();

    cout << "Y is equal to: " << x6 << endl;
    cout << "X is equal to: " << y6 << endl;

    if (x6 == x3)
    {
        if (y6 == y3)
        {
            cout << "Well done, you guessed correctly" << endl;
        }
        else
        {
            cout << "Unlucky " << player2 << ", That isn't right" <<
endl;
            //life system, user loses a life
            lives - 1;
            cout << "You lose a life," << " be careful" << endl;
        }

        if (lives == 0)
        {
            cout << "Unlucky " << player2 << "You lost" << endl;
        }
    }

    return 0;
}

```

Assignment

GRADEMARK REPORT

FINAL GRADE

34/100

GENERAL COMMENTS

Instructor

Exercise 1 (50) 24

Exercise 2 (30) 10

Exercise 3 (20) 0

Unfortunately, both submitted problems are a long way from working. Crucially, the approach is completely wrong - enormous numbers of impenetrably named variables, code thrashing rather than working problems.

Some significant work needed.

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