(1) Student and Computing Information

- Nicholas Phillips and Samantha Duffy Student ID: A031344011 and A01345195

- Advance Programming Principles and Assignment 6.

- Completed on a MacBook Pro running macOS Monterey version 12.1 and used Microsoft visual studios as the IDE.

(2) Purpose statement:

The purpose of this assignment is for students to implement Object-Oriented concepts. In this assignment, our team used the concepts of objects, inheritance, and polymorphism. The goal of this assignment is to use each of the concepts above to create a working mastermind game. For our assignment we created both public and private objects. For the private object, we place in the correct answer created by the computer and our function to verify if the color positions are correct and color. Next, the user has ten tries to guess the correct color sequence. The colors are red, blue, green, yellow, orange, and purple. To guess you enter the first letter of the color in a four letter sequence. After a guess, two numbers will be shown. The first number will say how many correct colors are in the right place. The second number says how many colors are correct in the wrong position. Then, after each guess, the user will lose a turn until ten tries are up. Finally, at the end of the game the correct sequence will be shown and the user will have the option to play again if they won or lost.

(3) Copy/paste your C++ code into the Word file

```
/*



Created by Nicholas Phillips and Samantha Duffy on April 27th-29th.



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*/



#include <iostream>

#include <sstream>

#include <string>

#include <cstdlib>  // For srand() and rand()

using namespace std;

void instructions (); //Function to display instructions

int codeChecker(); //Function to check codes


class codeMaker {

   //public attribute
```
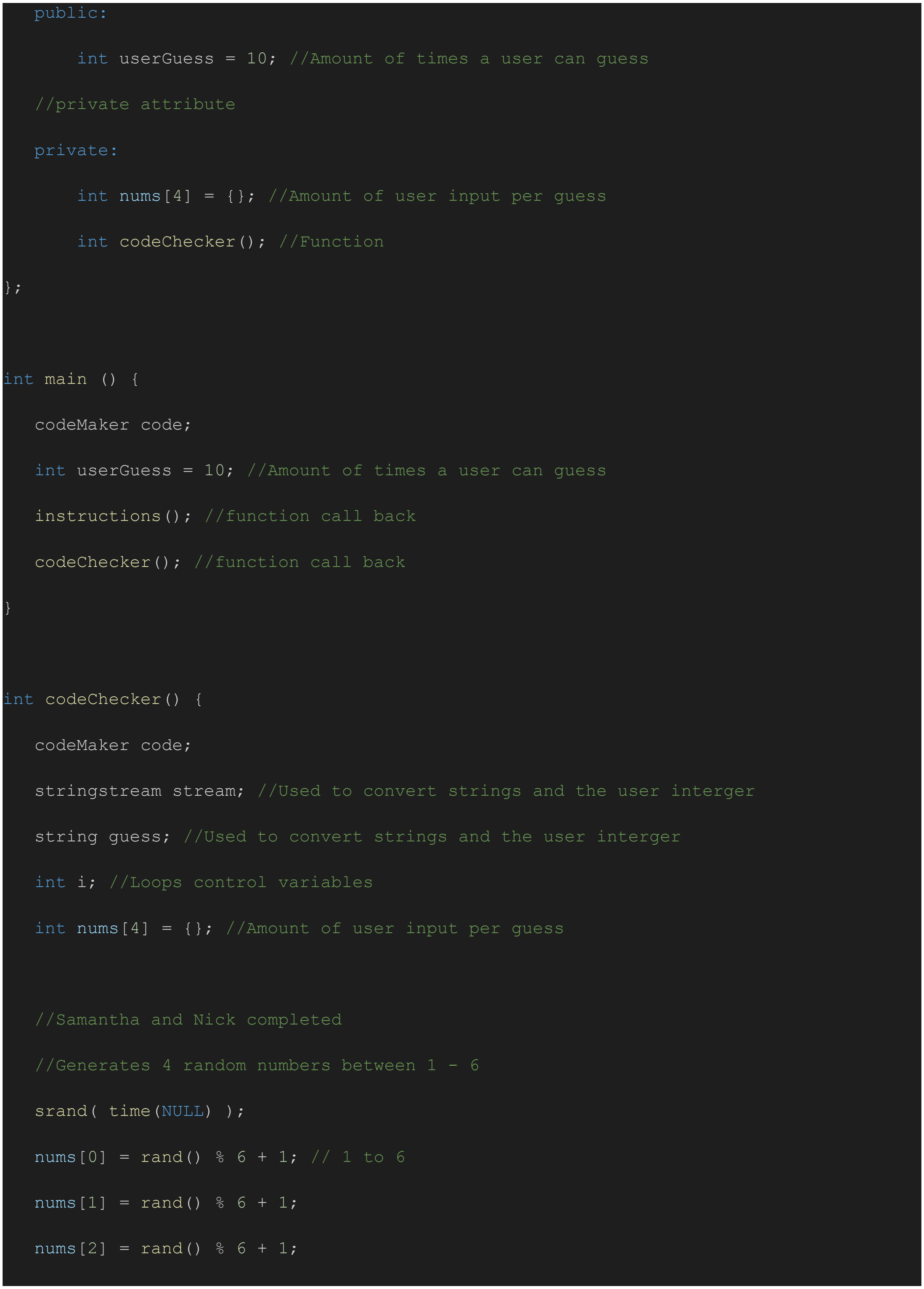
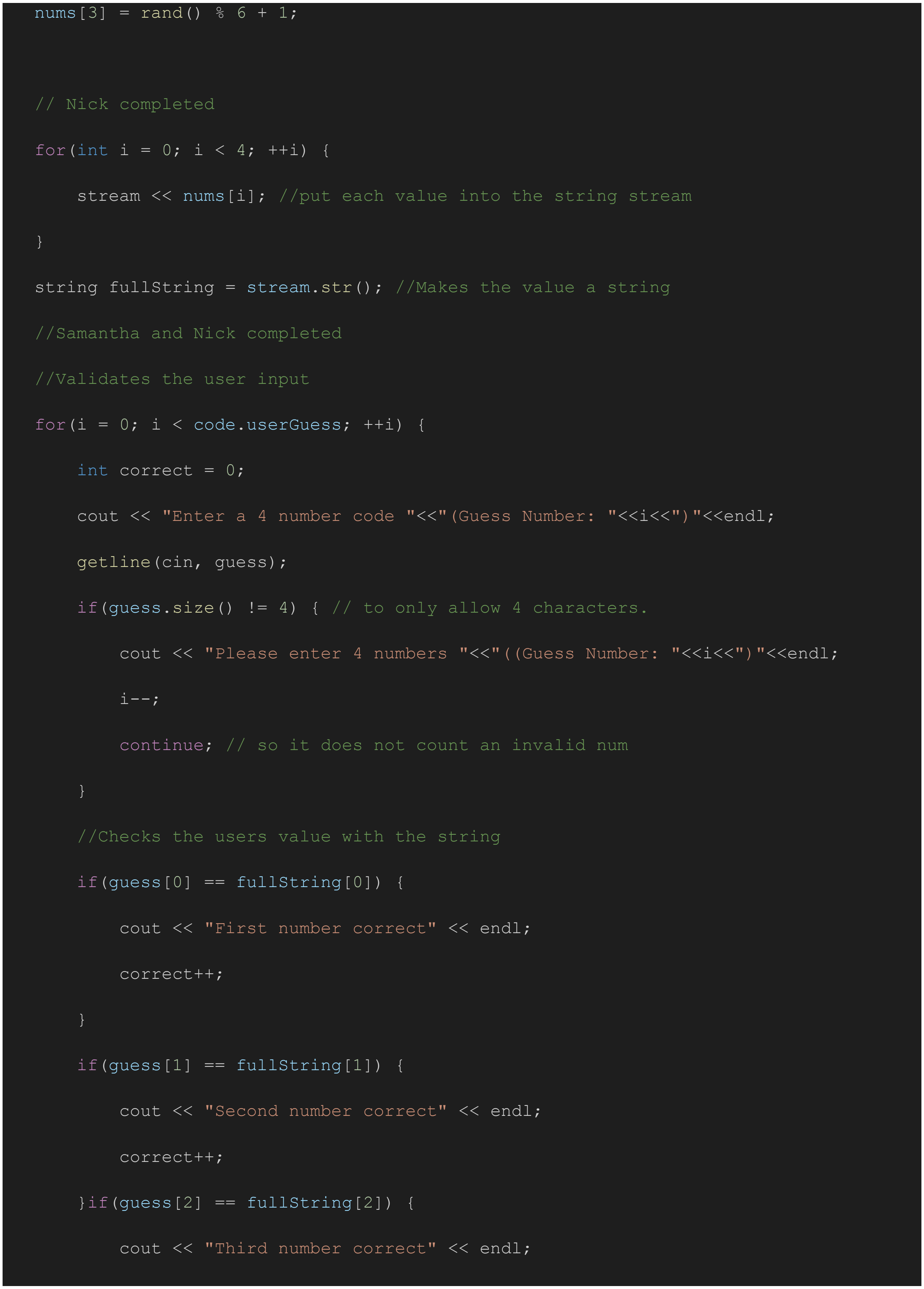
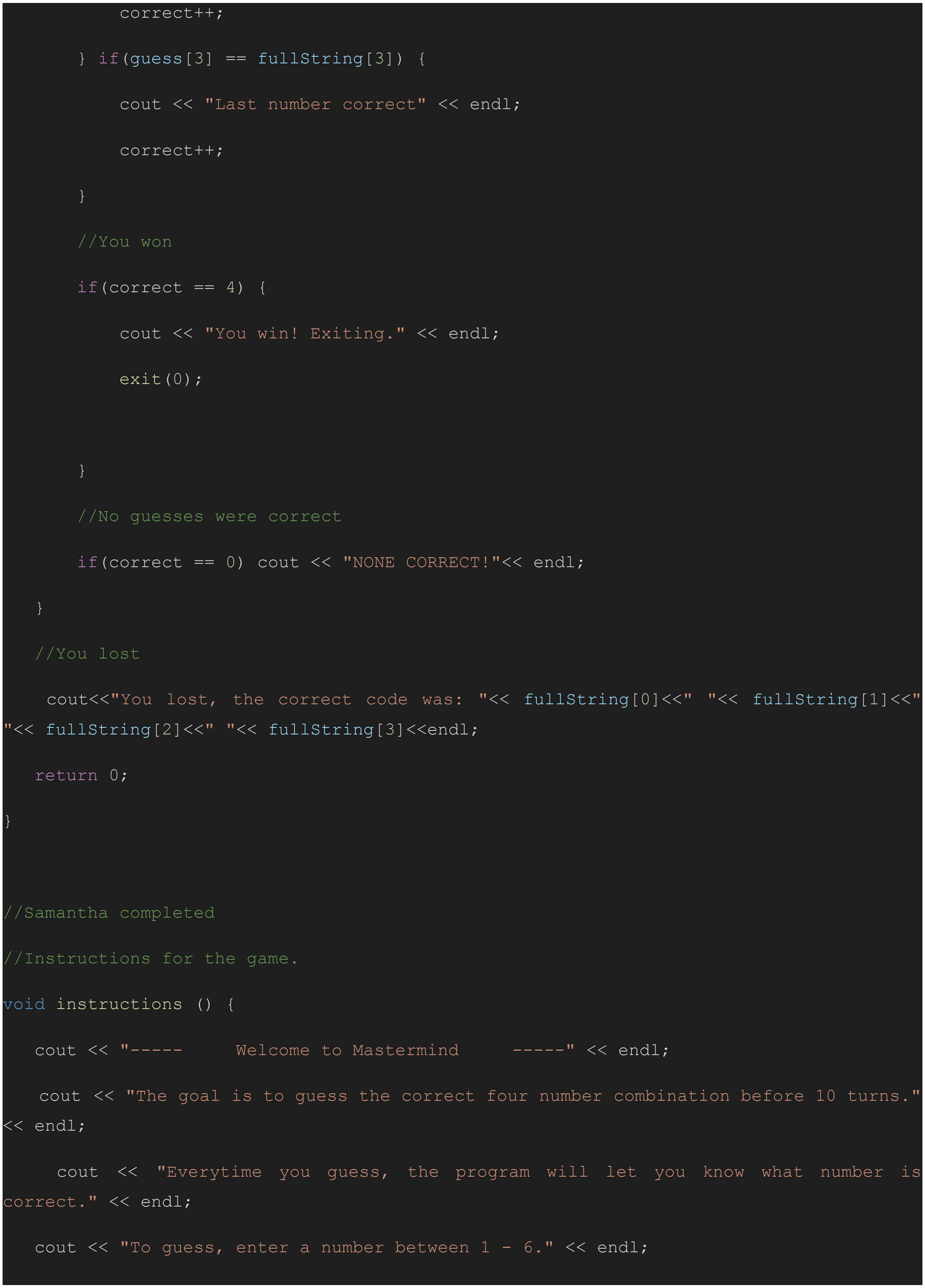



```
   public:
       int userGuess = 10; //Amount of times a user can guess
   //private attribute
   private:
       int nums[4] = {}; //Amount of user input per guess
       int codeChecker(); //Function
};

int main () {
   codeMaker code;
   int userGuess = 10; //Amount of times a user can guess
   instructions(); //function call back
   codeChecker(); //function call back
}

int codeChecker() {
   codeMaker code;
   stringstream stream; //Used to convert strings and the user interger
   string guess; //Used to convert strings and the user interger
   int i; //Loops control variables
   int nums[4] = {}; //Amount of user input per guess

   //Samantha and Nick completed
   //Generates 4 random numbers between 1 - 6
   srand( time(NULL) );
   nums[0] = rand() % 6 + 1; // 1 to 6
   nums[1] = rand() % 6 + 1;
   nums[2] = rand() % 6 + 1;
```



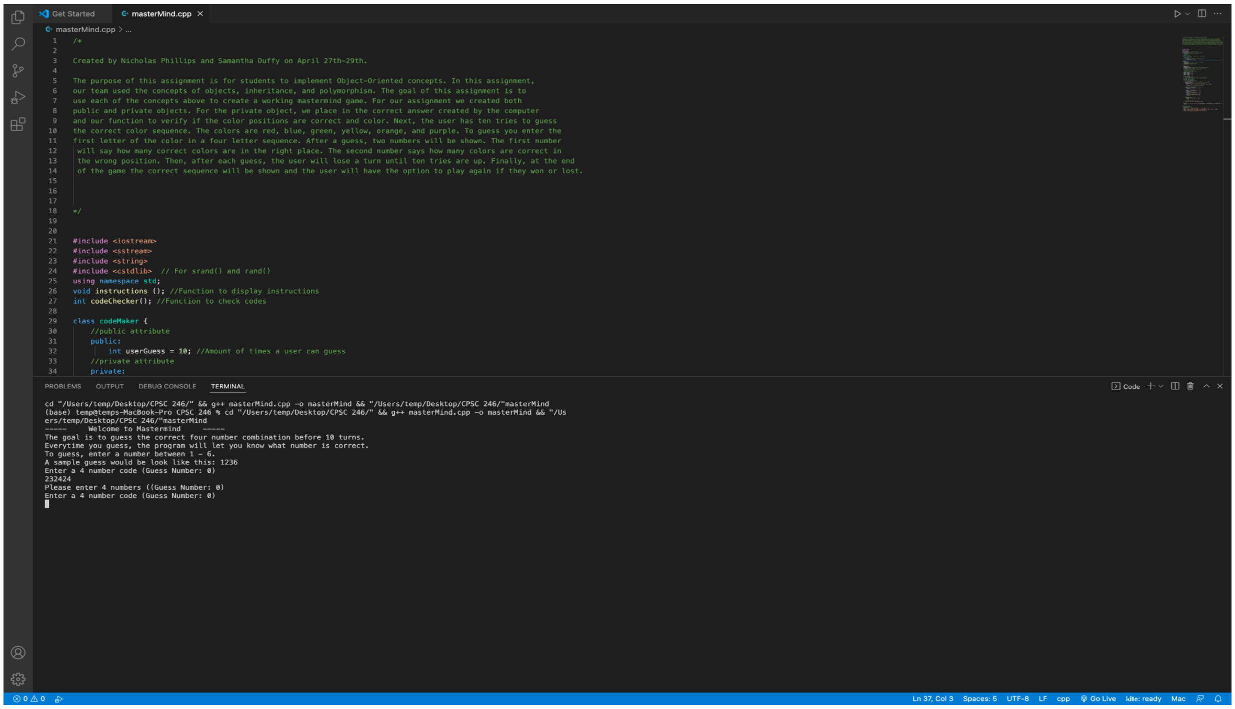
```cpp
nums[3] = rand() % 6 + 1;


// Nick completed
for(int i = 0; i < 4; ++i) {
    stream << nums[i]; //put each value into the string stream
}
string fullString = stream.str(); //Makes the value a string
//Samantha and Nick completed
//Validates the user input
for(i = 0; i < code.userGuess; ++i) {
    int correct = 0;
    cout << "Enter a 4 number code "<<"(Guess Number: "<<i<<")"<<endl;
    getline(cin, guess);
    if(guess.size() != 4) { // to only allow 4 characters.
        cout << "Please enter 4 numbers "<<"((Guess Number: "<<i<<")"<<endl;
        i--;
        continue; // so it does not count an invalid num
    }
    //Checks the users value with the string
    if(guess[0] == fullString[0]) {
        cout << "First number correct" << endl;
        correct++;
    }
    if(guess[1] == fullString[1]) {
        cout << "Second number correct" << endl;
        correct++;
    }if(guess[2] == fullString[2]) {
        cout << "Third number correct" << endl;
```



```
            correct++;

        } if(guess[3] == fullString[3]) {

            cout << "Last number correct" << endl;

            correct++;

        }

        //You won

        if(correct == 4) {

            cout << "You win! Exiting." << endl;

            exit(0);


        }

        //No guesses were correct

        if(correct == 0) cout << "NONE CORRECT!"<< endl;

    }

    //You lost

     cout<<"You lost, the correct code was: "<< fullString[0]<<" "<< fullString[1]<<"
"<< fullString[2]<<" "<< fullString[3]<<endl;

    return 0;

}


//Samantha completed

//Instructions for the game.

void instructions () {

    cout << "-----     Welcome to Mastermind     -----" << endl;

    cout << "The goal is to guess the correct four number combination before 10 turns."
<< endl;

     cout << "Everytime you guess, the program will let you know what number is
correct." << endl;

    cout << "To guess, enter a number between 1 - 6." << endl;
    cout << "A sample guess would be look like this: 1236" << endl;

}
```

(4) Copy/paste the output screen shots (**showing one whole game**) into the Word file

This is the output when you type in more than 4 numbers. It doesn’t count it as a guess and allows the user to reenter a new guess. :



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void instructions (); //Function to display instructions
int codeChecker(); //Function to check codes

class codeMaker {
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    public:
        int userGuess = 10; //Amount of times a user can guess
    //private attribute
    private:
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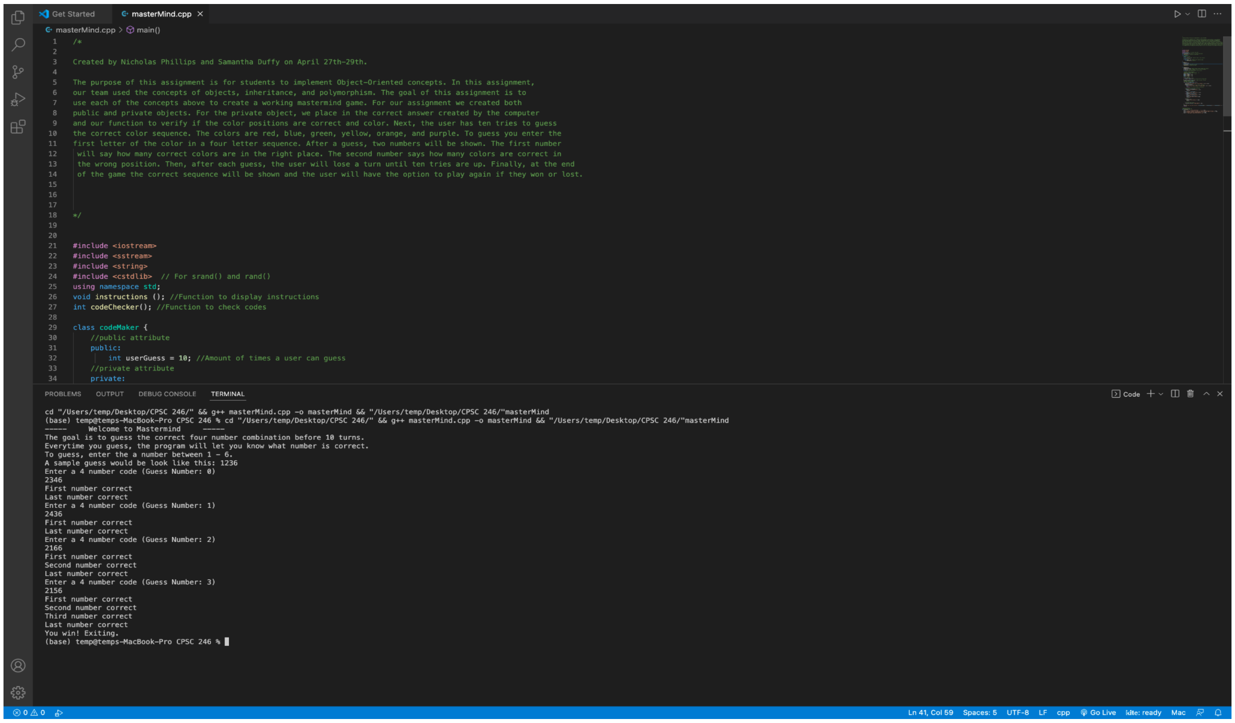
```
cd "/Users/temp/Desktop/CPSC 246/" && g++ masterMind.cpp -o masterMind && "/Users/temp/Desktop/CPSC 246/"masterMind
(base) temp@temps-MacBook-Pro CPSC 246 % cd "/Users/temp/Desktop/CPSC 246/" && g++ masterMind.cpp -o masterMind && "/Us
ers/temp/Desktop/CPSC 246/"masterMind
-----     Welcome to Mastermind     -----
The goal is to guess the correct four number combination before 10 turns.
Everytime you guess, the program will let you know what number is correct.
To guess, enter a number between 1 - 6.
A sample guess would be look like this: 1236
Enter a 4 number code (Guess Number: 0)
232424
Please enter 4 numbers ((Guess Number: 0)
Enter a 4 number code (Guess Number: 0)
```

This is the output when you win:



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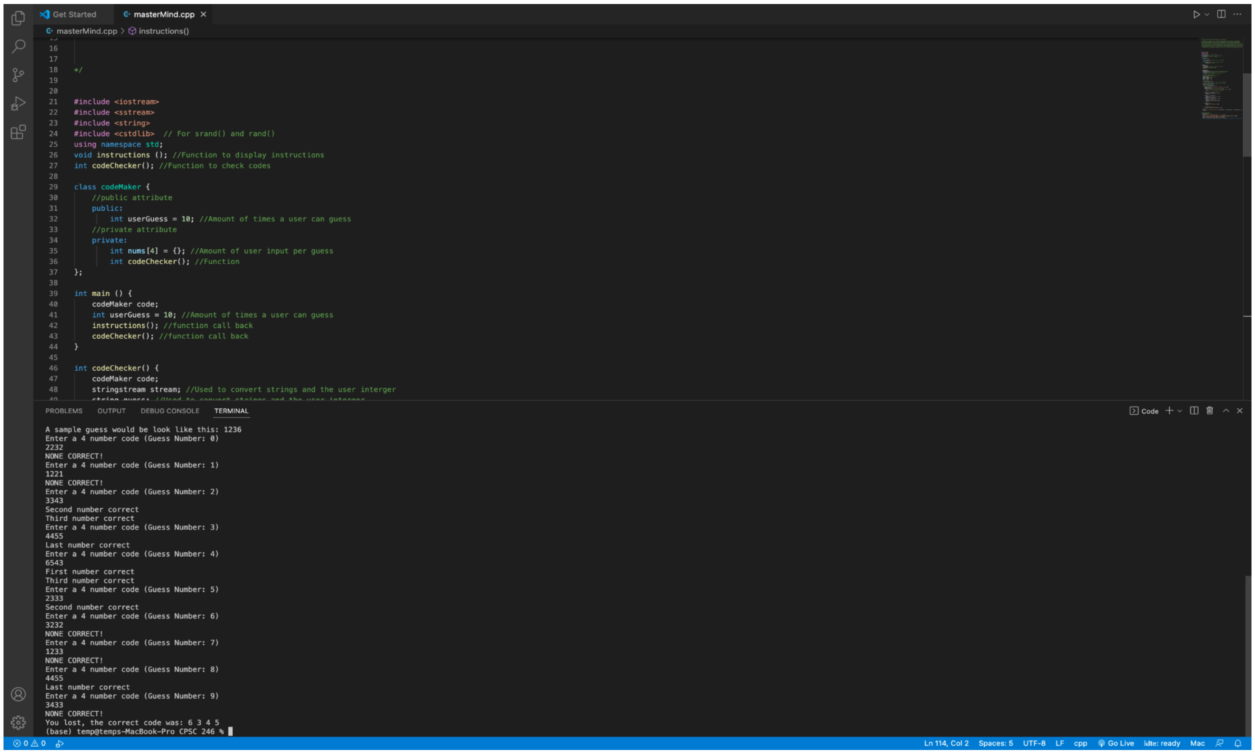
-----     Welcome to Mastermind     -----
The goal is to guess the correct four number combination before 10 turns.
Everytime you guess, the program will let you know what number is correct.
To guess, enter the a number between 1 - 6.
A sample guess would be look like this: 1236
Enter a 4 number code (Guess Number: 0)
2346
First number correct
Last number correct
Enter a 4 number code (Guess Number: 1)
2436
First number correct
Last number correct
Enter a 4 number code (Guess Number: 2)
2166
First number correct
Second number correct
Last number correct
Enter a 4 number code (Guess Number: 3)
2156
First number correct
Second number correct
Third number correct
Last number correct
You win! Exiting.
(base) temp@temps-MacBook-Pro CPSC 246 %
```

This is the output when you lose:



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    string guess; //Used to convert strings and the user interger
```

```
A sample guess would be look like this: 1236
Enter a 4 number code (Guess Number: 0)
2232
NONE CORRECT!
Enter a 4 number code (Guess Number: 1)
1221
NONE CORRECT!
Enter a 4 number code (Guess Number: 2)
3343
Second number correct
Third number correct
Enter a 4 number code (Guess Number: 3)
4455
Last number correct
Enter a 4 number code (Guess Number: 4)
6543
First number correct
Third number correct
Enter a 4 number code (Guess Number: 5)
2333
Second number correct
Enter a 4 number code (Guess Number: 6)
3232
NONE CORRECT!
Enter a 4 number code (Guess Number: 7)
1233
NONE CORRECT!
Enter a 4 number code (Guess Number: 8)
4455
Last number correct
Enter a 4 number code (Guess Number: 9)
3433
NONE CORRECT!
You lost, the correct code was: 6 3 4 5
(base) temp@temps-MacBook-Pro CPSC 246 % 
```