

**Student Name** \_\_\_\_\_ **Section** \_\_\_\_\_  
**Instructor** \_\_\_\_\_ **Due Date** \_\_\_\_\_

Thoroughly read the objectives, instructions and requirements of this special project and then use suitable electronic technology tools to solve the given project(s).

Submit both your program source code, with your name, date and course information in the heading portion of your code, as well as the required output(s).

**( Game Theory and Sequential File Processing ) ( 100 Points Maximum ) your score \_\_\_\_\_**

**Objective** To use the C++ `rand()` function to generate pseudo - random numbers.

### **PROJECT DESCRIPTION**

Write a program that allows a user to play the game of "guessing a number" as follows:

Your code chooses a number to be guessed by randomly selecting an integer in the range of 1 to 20. The program then prints the following to the screen:

```
I have a number between 1 and 20.  
Can you guess it?  
Please type your first guess.
```

The user then types a first guess. Your program then responds with one of the following choices:

1. Excellent! You guessed the correct number!  
Would you like to play again (y or n)?
2. Too low. Please try again.
3. Too high. Please try again.

Your program should continue looping until the player guesses correctly. Your program should display Too high or Too low to the user until the right number is entered.

A partially completed program is provided within **Figure 1**. Finish coding the program that follows and run a sample program till the correct answer is found.

Note: there are comment sections in the given program which indicates what to specifically complete.

### **Information About This Project**

This program implements the C++ `rand()` function. The general format for scaling and shifting a random number is:

```
n = a + rand() % b;
```

where *a* is the shifting value (equal to the first number in the desired range of consecutive integers) and *b* is the scaling factor (equal to the width of the desired range of consecutive integers).

### **Steps To Complete This Project**

#### **STEP 1**

#### **Open Visual C++ and Complete the Program Code**

Open MS Visual C++ on your computer. Complete the program code in **Figure 1** that will allow the user to enter the necessary input items and then use these items to compute the required output value(s).

#### **STEP 2**

#### **Compile and Run your Program**

Build, compile and run your program. Test the operation of your program.

#### **STEP 3**

#### **Print your Program Code and your Run Time Output**

When completed, print your program source code as well your program output. Submit the hardcopies for credit.

Include your name, course information and data in the heading portion of your program code.

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**PROJECT ( Game Theory and Sequential File Processing )****Figure 1 Partially Completed Guessing Game Code**

```
#include <iostream>
#include <stdlib.h> //Header file for call to functions RAND, SRAND
#include <time.h> //Header file for call to TIME function
using namespace std;
void guessingGame(void);
int main(void)
{
    srand(time(NULL));
    guessingGame();
    return 0;
}
void guessingGame(void)
{
    int x, guess, response;
    do {
        //assign an integer value to variable x that is in the range of 1 to 20
        x = ;
        cout << endl << "Welcome: the guessing game. \nI have a number from 1"
            << "and 20." << endl << "Can you guess it?" << endl
            << "Please type your first guess." << endl << "? ";
        cin >> guess;
        // Complete the while loop condition to allow the user to continue and
        // input another guess if necessary
        while ( ) {
            if (guess < x )
                // Complete cout statements that tell the user if they are too high or
                // too low
                cout << ;
            else
                cout << ;
            cin >> guess;
        }
        cout << endl << "Great job - you guessed the correct number!" << endl
            << "Would you like to try again?" << endl << "Please type "
            << "(1 = yes, 2 = no)? ";
        cin >> response;
    } //complete the while condition to allow the user to play again
    while ( );
}
```

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**PROJECT ( Game Theory and Sequential File Processing )****STEP 4****Modify the Program Code**

With your application correctly functional, modify the program code to save the user's guess and your programs answer to their guess to a text file.

**STEP 5****Compile and Run your Modified Program**

Build, compile and run your program. Test the operation of your program.

**STEP 6****Print your Program Code and your Run Time Output**

When completed, print your program source code as well your program output. Submit the hardcopies for credit.

Include your name, course information and data in the heading portion of your program code.