

**Student Lab Activity**

CIS170C Week 4 Lab Instructions

Lab 4 of 7: Functions

Lab Overview – Scenario/Summary

You will code, build, and execute a program that simulates a coin toss and a dice roll.

Learning outcomes:

1. Write functions using parameters.
2. Be able to debug a program with syntax and logic errors.
3. Be able to use the debug step-into feature to step through the logic of the program and to see how the variables change values.

Deliverables

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| **Section** | **Deliverable** | **Points** |
| **Lab 4** | Step 5: Program Listing and Output | **30** |
| **All Steps** | **Total** | **30** |

Lab Steps

Preparation:

If you are using the Citrix remote lab, follow the login instructions located in the iLab tab in Course Home.

Locate the Visual Studio icon and launch the application.

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| **Step 1:** Requirements: **Coin Toss and Dice Rolling program** |
| Write a program that simulates flipping a coin and rolling a dice.  A user will input their choice of flipping a coin (C), rolling a dice (D), or Exiting(E).  If the user chooses a coin toss, the program will ask how many times the coin should be tossed, then will simulate tossing the coin that many times and print the result to the user.  If the user chooses rolling a die, the program will ask how many sides the die has and h ow many times it should be rolled. The program will then simulate rolling a die (with the number of sides specified) that many times.  The program will continue until the user presses E.  **This should be a lot of fun!**  **Here are some great things to think about as you begin your program!**  **You will need two functions.** A **string flipCoin()** and a **int rollDice(int)** function**.** These functions will generate a random number. For the coin flip the random number should be in the range of 1 to 2. If the number is 1 the function should return “heads”. If the random number is 2, the function should return “tails”. For the roll dice function, the random number should be in the range of 1 to the number of sides. The function should return the result of the die roll.   Important notes: You will want to seed your random number generator. To do this at the beginning of your program #include <ctime>  Use the following commands to seed the random number generator:  //Get the system time to use it to seed the random number generator  unsigned seed = time(0);    //seed the random number generator  srand(seed);  to get a random number between one and 2 use the following code: int toss = 1 + rand() % 2;  **Sample Output from the Program**  Welcome to the Random Value Generator!  Would you like to flip a coin (C) or roll a die (D) or Exit (E): C  How many times do you want to flip the coin: 5  flip 1 : tails  flip 2 : heads  flip 3 : heads  flip 4 : heads  flip 5 : tails  Would you like to flip a coin (C) or roll a die (D) or Exit (E): D  How many sides does your die have: 6  How many times do you want to roll the die: 5  roll 1 : 5  roll 2 : 3  roll 3 : 2  roll 4 : 2  roll 5 : 2  Would you like to flip a coin (C) or roll a die (D) or Exit (E): D  How many sides does your die have: 20  How many times do you want to roll the die: 3  roll 1 : 19  roll 2 : 16  roll 3 : 15  Would you like to flip a coin (C) or roll a die (D) or Exit (E): E  Thanks for playing!  Press any key to continue . . . |
| **Step 2:** Processing Logic |
| Using the pseudocode below, write the code that will meet the requirements.  Main Function     Declare the number of tosses, number of sides, and user choice.  Seed the random number generator      while user choice !=E         Ask the user if they want to flip a coin, roll a die, or exit          If the choice is C  Ask the user how many times to flip the coin.  For i=1 to number of flips step 1  Call flipCoin()  Print result          If the choice is D  Ask the user how many sides the die has.  Ask the user how many times to roll the die  For i=1 to number of rolls step 1  Call rollDice()  Print result         Else  Display the closing message  flipCoin Function  generate an integer random number between 1 and 2.  If a 1 is generated return “heads”, else return “tails”  rollDice Function  generate a random number between 1 and the number of sides  return the result of the roll. |
| **Step 3:** Create a New Project |
| Create a new project and name it LAB4.    Write your code using the processing logic in Step 2 (above). Make sure that you save your program. |
| **Step 4:** Compile and Execute |
| 1. Compile your program. Eliminate all the syntax errors. 2. Build your program and verify the results of the program. Make corrections to the program logic, if necessary, until the results of the program execution are what you expect. |
| **Step 5:** Print Screen Shots and Program |
| 1. Capture a screen print of your output (do a print screen and paste into an MS Word document). 2. Copy your code and paste it into the same MS Word document that contains the screen print of your output. 3. Save the Word document as Lab04\_LastName\_FirstInitial. |
| **END OF LAB** |