The University of the West Indies, St. Augustine

COMP 1602 Computer Programming II

Summer, 2020/2021

**Tutorial 3**

1. Write a function, `getPosition`, which given a character as a parameter, returns 0 if the character is not a letter of the English alphabet; otherwise, it returns the position of the letter in the alphabet. For example, given the letter 'G' it returns 7. The function should work if the character is either an uppercase or a lowercase letter. Use the function in main to determine the positions of 'A', 'c' and 'y'.

2. Write a function, `addRandomNumbers`, that generates two random numbers between 1 and 10 (inclusive), adds them and prints the result. Test this function from main.

3. Write a function, `guessingGame`, to generate a number from 1 to 100 (inclusive) and ask the user for up to 10 guesses. If a guess is correct, the user wins. If not, you inform them that their guess was either too low or too high.

4. Write a function, `cheatersDie`, to simulate a 6 sided cheater's die, where a 6 is twice as likely to occur as any other number. It must return a number 1 to 6 (inclusive) to represent each face of the die. Simulate 12 rolls of the die from main and print the results.

5. Write down the sequence of events that would occur if we have to simulate a queue with the following data: start time is 10:00am, number of counters is 2, arrivals is [1, 4, 5 ,3] and service times is [6, 12, 8, 9].

| Customer | Arrives | Start Service | Counter | Service Time | Depart | Wait Time |
|----------|---------|---------------|---------|--------------|--------|-----------|
| 1 | 10:01 | 10:01 | C1 | 6 | 10:07 | 0 |
| 2 | 10:05 | 10:05 | C2 | 12 | 10:17 | 0 |
| 3 | 10:10 | 10:10 | C1 | 8 | 10:18 | 0 |
| 4 | 10:13 | 10:17 | C2 | 9 | 10:26 | 4 |

6. (a) What is the main difference between text and binary files?

A text file is a sequence of characters organized into lines. Generally, each line is terminated by a newline character. A binary file is simply a sequence of bytes, with no character translations occurring on input or output. Thus, there is a one-to-one correspondence between what is read or written and what is stored in the file.

(b) List two advantages of binary files.

   1. Data transfer is much faster, since no data conversions are necessary; the data is read and written as is.

   2. The values of data types such as arrays and structures can be written to a binary file. For a text file, individual elements must be written.

   3. Data stored in a binary file usually occupies less space than the same data stored in a text file.

(c) Write code in main to open a binary file `data.dat` and write the number 100 to the file. You must then open and read back the value from the binary file.