Bachelor of Technology Partnership McMaster University ENGINEERING MOHAWK COLLEGE

SFWR TECH 3PR3
Arrays & C-Strings

For each of the following problems, be sure to output the results to the console.

1. Create a program that will use an array to store 100 random numbers in the range of 100 to 200 inclusive. Do each of the following:
    a. Create an array of double that will hold 100 values
    b. Use a loop to store 100 random numbers in the range of 100 to 200
    c. Print the total of all 100 random numbers.
    d. Print the average of the 100 random numbers
    e. Print the maximum value of 100 numbers
    f. Print the index of the maximum value.

2. Write a function called countNegative that will accept an array as a parameter. The function should include a second value that will indicate how many values are present in the array. Have the function determine the number of values in the array that are less than 0 and then return this value to the calling function. You may hardcode the array into your program using the following static array declaration:

```
int testArray[] = {-2,0,44,12,-45,17,934,-21,67,88,91,1,0,6};
int n = 14;
```

3. A file has been provided called scores.txt. The file consists of 50 rows with each row consisting of 6 double values. Read the data in the file into a 2D array. Output the following information about the data:
    a. Print the column number and total (start your column count at 0) of the column with the highest total.
    b. Print the row number (start your row count at 0) of the row with the lowest total.
    c. Print the column index and row index and value of the number that is closest to 50.
    (Hint: you may find the **fabs** function useful for this part)

4. Word Counter

    Write a function that accepts a pointer to a C-string as an argument and returns the number of words contained in the string. Demonstrate the function in a program that asks the user to input a string and then passes it to the function. The number of words in the string should be displayed on the screen.

5. Average Number of Letters

   Modify the “Word Counter” function, so it also displays the average number of letters in each word.

6. Password Verifier

   Imagine you are developing a software package that requires users to enter their own passwords. Your software requires that users’ passwords meet the following criteria:

   - The password should be at least six characters long
   - The password should contain at least one uppercase and at least one lowercase letter.
   - The password should have at least one digit.

   Write a program that asks for a password and then verifies that it meets the stated criteria. If it doesn’t, the program should display a message telling the user why.

Note: - Indicate the units for all I/O values required from- or provided to- the user.