The American University in Cairo
Computer Science & Engineering Department
CSCE100109 – Fundamentals of Computing I
Spring 2022– Assignment 6

Solve the following problems using C++, and make sure you document your code with comments:

1. Write a program called **problem1.cpp** that: (15 points)
   a. Populates a dynamically created array called A of 100 elements with random integer numbers.
   b. Create a function called void sort(int values[]) that sorts the elements of the array in ascending order.
   c. Create a function called void print(int values[]) that prints the content of an array passed to it.

   This is how you would call the functions:

   ```
   sort(A);
   print(A);
   ```

2. Write a C++ program **problem2.cpp** that asks the user for the size of the array, then create a dynamic array of the input size using a pointer. The user then starts filling the array, then the array is passed to a function that calculates the average of the numbers in the array and returns the average value to the main. Delete the pointer when you are done. (10 points)
3. Write a C++ program **problem3.cpp** that asks the user for the size of the array, create a dynamic array of the input size using a pointer. Ask the user to start filling the array with values. Create a second dynamic array and make it the reverse of the original array. For example if the user enters sz = 4 and arr= (1,2,3,4), the second array should have the values (4,3,2,1) (10 points)

4. Write a program called **problem4.cpp** that creates a two-dimensional array called numbers. The array has four rows and six columns. Use for loops to populate the array with the values below (without getting any input from the user), then print the contents of the array. (30 points)

24	23	22	21	20	19
18	17	16	15	14	13
12	11	10	9	8	7
6	5	4	3	2	1

Extends the problem by computing the **average** of the elements of each column, and the **sum** of the elements of each row..
You should then print the results out. You must use for loops.
For example,. The sum of the elements of row 0 are 24+23+22+21+20+19
Hint: To compute the sum of elements in a column, every time you start going through a new column, reset the value of sum to zero, accumulate the values, then print them, and so on!

5. Write a program called **problem5.cpp** that performs the following tasks: (10 points)
   a. Create variables value1 and value2 have been declared, and initialize value1 to 200.
   b. Declare the variable iPtr to be a pointer to an int;
   c. Assign the address of variable value1 to pointer iPtr.
   d. Print the value of the memory location pointed to by iPtr.
   e. Assign the value of the memory location pointed to by iPtr to variable value2.
   f. Print the value of value2.
   g. Print the address of value1.
   h. Print the address stored in iPtr. Is the value printed the same as the address of value1 (just think about this)?