LAU
School of **Arts and Sciences**

Lebanese American University
School of Arts and Sciences
Department of Computer Science and Mathematics

CSC326 – Operating Systems
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Lab Assignment 1
Due: 25 September, 2022

Problem 1:

Write a program that displays the following text. Note that there are multiple ways to code this program.

```
****************************************************
*  " Everybody should learn how to program a computer *
*          because it teaches you how to think "      *
****************************************************
```

- *Submit your solution in a file called "Problem1.c".*

Problem 2:

Write a C program that considers three variables w and l of type integers representing the width and length of a rectangle, and r of type integer representing the radius of a triangle. The variables w, l and r have the following values 2, 11 and 5, respectively. Your program should initialize two new variables *areaRectangle* and *areaCircle* to return the area of the rectangle and the circle, respectively.

Sample input/output:

```
The area of the rectange (w=2, l=11) is 22
The area of the circle of radius r=5 is 78.539816
```

Note: In order to get the π value, you may assume it is has the value of 3.14 or you may use the "math.h" library by including the following " #include <math.h>" header and then use "M_PI".

- *Submit your solution in a file called "Problem2.c".*

Problem 3:

Write a C program that considers three numbers a, b and c. Initialize the three variables to have the following values 3 , 8 and 5, respectively. Then, create a function "Average" that takes as input the three variables and returns if the average of the three variables. Use your method in order to compute the average and display the results.

Sample input/output:

```
The average is 5.33
```

- *Submit your solution in a file called "Problem3.c".*

Problem 4:

Write a C program that considers two points A and B in the xy-plane, having the following coordinates: $A(2,4)$ and B (3,15). Create a function "distance" that computes the Manhattan distance between any two points taking as input the coordinates of the points and returning the distance between them. The Manhattan distance is computed as the sum of the absolute differences between the two points as follows:

$$D = |x_A - x_B| + |y_A - y_B| \tag{1}$$

Use your function to compute the Manhattan distance between A and B and display the results as shown below.

Note: In order to get the absolute value of a number, you may need to use the "math.h" library by including the following " #include $<math.h>$" header and then call the function "fabs(a)" that returns the absolute value of a.

Sample input/output:

```
The Manhattan distance between A and B is 12.00
```

- *Submit your solution in a file called "Problem4.c".*