Department of Computer Engineering

**CENG104 – Computer Programming II**

Spring 2017 - 2018

**Lab Guide #1/A – Week 2**

**OBJECTIVE** : General review of CENG103 subjects

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**Q1.**

**a)** Write a function **disp-one** that displays the elements of a one-dimensional array.

**b)** Write a function **disp-two** that displays the elements of a two-dimensional array with 4 columns.

**c)** Write a function **findMax** to find the maximum number within the given two dimensional array.

**d)** Write a function **product** that finds the product of the values in a one dimensional array.

Write a program that will store 16 integer values taken from a text file named **num.txt** into a two dimensional array **matrix[4][4]** rowwise, store the diagonal elements of the matrix into a one dimensional array **diagonal[4]**. It should also determine the product of the diagonal elements, and display the matrix, the diagonal array and the product, and the maximum number of the array by using the above functions.

**Example Run:**

```
Matrix is
 5   7   8   9
11  43   2   6
31  19  12  45
 3   1  15  16

Diagonal is
5 43 12 16

The maximum number of the array is 45

Product is 41280
```

**num.txt**

```
5 7 8 9 11 43 2 6 31 19 12 45 3 1 15 16
```

**Project_name:** Lab1_Q1
**File_name:** Question_1.cpp

## Q2. (USE ONLY POINTER NOTATION)

Write the function **readFromFile** that takes a file pointer, a one-dim array to keep the team Ids and a two-dimensional array to keep the game scores as parameter. The function reads the team IDs into the one-dim array and 4 game scores of several bowling teams into the two-dim array from the specified file. The function also returns the number of teams.

Write the function **findTeamAvg** that takes the two-dim scores array and the number of team as input parameters, finds the average of each team and stores the averages into a one-dim array.

Write the function **findGameAvg** that takes the two-dim scores array and the number of team as input parameters, finds the average of each game and stores the averages into a one-dim array.

Write the fu
nction **displayGameAvg** that takes the one-dim array which keeps the game averages as input parameter and displays the averages of all games on the screen.

Write a C program that reads IDs and game scores of several bowling teams from the file **bowling.txt;** finds and displays the average of each game and the average of each team using the functions above. See the example run.

**Project Name:** Lab1_Q2
**File Name:** Question_2.cpp

**bowling.txt:**

| Team No | Game1 | Game2 | Game3 | Game4 |
|---|---|---|---|---|
| 11 | 475 | 570 | 500 | 382 |
| 22 | 450 | 550 | 575 | 425 |
| 33 | 375 | 482 | 552 | 512 |
| 44 | 352 | 545 | 314 | 525 |
| 55 | 560 | 385 | 475 | 395 |
| 66 | 496 | 520 | 345 | 485 |
| 77 | 373 | 582 | 698 | 424 |
| 88 | 545 | 510 | 570 | 475 |
| 99 | 595 | 347 | 465 | 500 |
| 12 | 550 | 345 | 562 | 483 |

**Example Run:**

```
Team Number  Average
***********  *******
 11          481.75
 22          500.00
 33          480.25
 44          434.00
 55          453.75
 66          461.50
 77          519.25
 88          525.00
 99          476.75
 12          485.00

Game Number  Average
***********  *******
1            477.1
2            483.6
3            505.6
4            460.6
```