National University of Computer and Emerging Sciences

Lab Manual

for

Programming Fundamentals

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Section	BSCS-N
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Objectives:

In this lab we will learn

- 2- D Arrays
- Arrays with Functions

Problems:

Problem 1: (Marks 12)

Write a program that creates a two-dimensional array initialized with test data. Use any data type you wish (except char). The program should have the following functions:

• getTotal. This function should accept a two-dimensional array as its argument and return the total of all the values in the array.

• getAverage. This function should accept a two-dimensional array as its argument and return the average of all the values in the array.

• getRowTotal. This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a row in the array. The function should return the total of the values in the specified row.

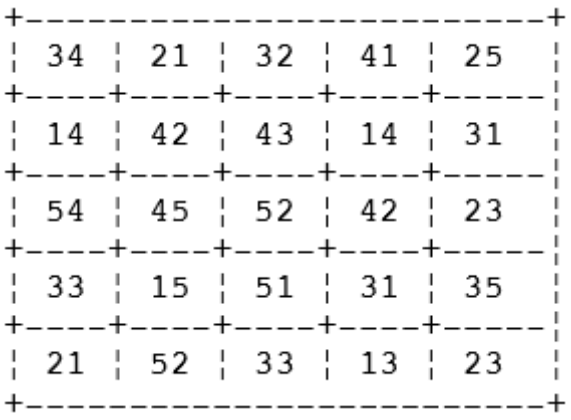
• getColumnTotal. This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a column in the array. The function should return the total of the values in the specified column.

• getHighestInRow. This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a row in the array. The function should return the highest value in the specified row of the array.

• getLowestInRow. This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a row in the array. The function should return the lowest value in the specified row of the array. Demonstrate each of the functions in this program.

Problem 2: (Marks 10)

Maze Runner



34	21	32	41	25
14	42	43	14	31
54	45	52	42	23
33	15	51	31	35
21	52	33	13	23

Do you like treasure hunts? In this Task you are to write a program to explore the above array for a treasure. The values in the array are clues. Each cell contains an integer between 11 and 55; for each value the ten's digit represents the row number and the unit's digit represents the column number of the cell containing the next clue. Starting in the upper left corner (at 1,1), use the clues to guide your search of the array. (The first three clues are 11, 34, 42). The treasure is a cell whose value is the same as its coordinates. Your program must first read in the treasure map data into a 5 by 5 array. Your program should output the cells it visits during its search, and a message indicating where you found the treasure.

Note: The value in maze/2D-Array are not final, you may setup your own values in array, which obviously should not affect the logic to find the treasure.

Problem 3: (Marks 8)

Write a program that creates a two-dimensional char type array initialized with test data. Containing 5 names. You have to count the number of characters repeated in each row.

Using following function prototypes:

```
void rowLetterCheck(char names[][5], int size);
```

Example:

When initializing array of 3 x 3

```
char names[3][3] = { {'s','s','s'},
                     {'h','u','d'},
                     {'s','s','s'} };
```

Output:

```
############################################################

The letter s appears 3 times in row no.1

The letter h appears 1 times in row no.2
The letter u appears 1 times in row no.2
The letter d appears 1 times in row no.2

The letter s appears 3 times in row no.3
```