Department of ICT
Faculty of Technology
University of Ruhuna

Programming Practicum – ICT1142 **Level 1- Semester 1**

Lab Sheet 09 **| 2022**

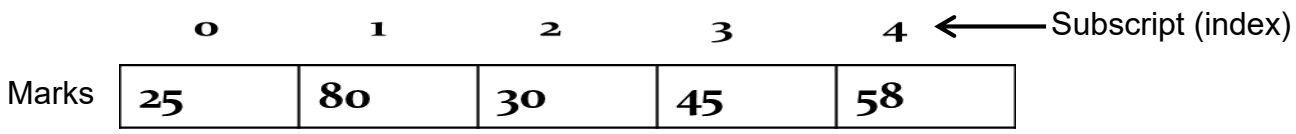
Objective:
The purpose of this lab session is to become familiar with Arrays, functions and loops in C.

Arrays

An array is a sequence of elements of the same type that share a common name and that are distinguishable by their position within the array.

Declaration of Arrays: **data type variable_name[size];**
int a[25], char name[10], float length[5];

Storing values in an Array: int Marks[5]={25,80,30,45,58};



Exercise 01

Try the given code to input 10 numbers into an array and print array elements.

```
int maxsize = 10;
int arr[maxsize];
int i,N;
printf("Enter %d elements to the array:\n",maxsize);
for(i=0; i<maxsize; i++){
        scanf("%d", &arr[i]);
}

printf("\n\nPrint array elements");
for(i=0; i<maxsize; i++){
        printf("  %d", arr[i]);
}
```

Exercise 02

Write a C program to store elements into an array and find the **sum** of all elements of the array and **average** of them. User needs to determine the size of the array.

Example:
Input size of the array: 5
Input elements: 10, 20, 30, 40, 50
Sum of all elements = 150

Exercise 03

(i) Write a C program that asks the user to type 10 integers of an array. Find the **maximum and minimum** within the array with their **index numbers**.

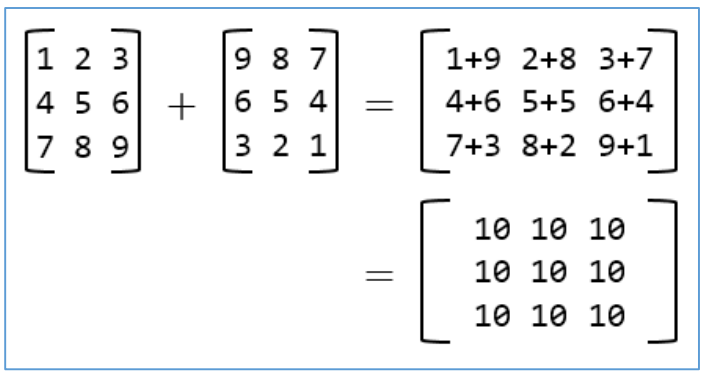
(ii) Modify the same program to search whether given element exist in the array or not. If exists, print the index of the element, otherwise print an error message.

Exercise 04

Write a C program which takes 2 arrays of 10 integers each**, first** and **second**. **The third** is an array with 20 integers. The program should store first and second arrays into **third**, where the first 10 integers of **third** array should from array **first**, the latter 10 from array **second (Using a single loop)**. Finally should display array **third**.

Exercise 05

Write a C program that could handle matrix manipulations. Your program should be able to manipulate 3x3 matrices and read element of two matrices. Finally add elements of both matrices to a new matrix.



Exercise 06

Write a C program which defines the array called **"Marks"** to store marks of 10 students.

```
int main()
{
   float Marks[10];
   readMarks(Marks);
   printMarks(Marks);
   float sum=TotalMarks(Marks);
   printf("Total Marks: %0.2f", sum);
   return 0;
}
```

readMarks(float Marks[]) function to read marks from the keyboard.

printMarks(float Marks[]) function to print marks on the screen.

float TotalMarks(folat Marks[]) function to calculate sum of the marks and returns.

Implement above functions to complete the program to get the given output.

```
Enter Marks number1: 1
Enter Marks number2: 2
Enter Marks number3: 3
Enter Marks number4: 4
Enter Marks number5: 5
Enter Marks number6: 6
Enter Marks number7: 7
Enter Marks number8: 8
Enter Marks number9: 9
Enter Marks number10: 10


----Display Student marks-----

 Marks 1 :  1.00
Marks 2 :  2.00
Marks 3 :  3.00
Marks 4 :  4.00
Marks 5 :  5.00
Marks 6 :  6.00
Marks 7 :  7.00
Marks 8 :  8.00
Marks 9 :  9.00
Marks 10 :  10.00

-----Total marks-------

Total Marks : 55.00
```

Exercise 07

Write a C program that read numbers from an integer array and graph the information in the form of bar chat. Sample output is given below.

```
Element Value Histogram
0          19   ******************
1          3    ***
2          15   ***************
3          7    *******
4          11   ***********
5          9    *********
6          13   *************
7          5    *****
8          17   *****************
9          1    *
```