LAB5: ARRAY

Objective: The main objective of this lab is to:

- **Know about array that provides convenient structure for representing data in C program.**

Practice 1

Write a C program to find the sum of marks of n students using array.

Sample Code

```
#include <stdio.h>
int main(){
int marks[10],i, n, sum=0;
printf ("Enter number of students: ");
scanf("%d",&n);
for(i=0;i<n;++i){
printf("Enter marks of student%d: ",i+1);
scanf("%d",&marks[i]);
sum+=marks[i];
}
printf("Sum= %d",sum);
return 0;
}
```

Sample Output

```
Enter number of students: 3
Enter marks of student1: 12
Enter marks of student2: 31
Enter marks of student3: 2
Sum =45
```

Do it yourself

Write a C program to find the average of marks of n students using array.

Practice 2

Write a C program to find the largest element of an array.

Sample Code

```
#include <stdio.h>

int main(){

int i,n;

float arr[100];

printf("Enter total number of elements(1 to 100): ");

scanf("%d",&n);

printf("\n");

for(i=0;i<n;++i){

printf("Enter Number %d: ",i+1);

scanf("%f",&arr[i]); }

for(i=1;i<n;++i){

if(arr[0]<arr[i])

arr[0] = arr[i];

}

printf("Largest element = %.2f",arr[0]);

return 0;

}
```

Do it yourself

Write a C program to find the smallest element of an array.

Practice 3

Write a C program to reverse the elements of an array.

Sample Code

```
#include <stdio.h>
 int main( ){
 int n, c, d, a[100], b[100];
 printf("Enter the number of elements in array\n");
 scanf("%d", &n);
```

```
 printf("Enter the array elements\n");
 for (c = 0; c < n ; c++)
 scanf("%d", &a[c]);
 for (c = n - 1, d = 0; c >= 0; c--, d++)
 b[d] = a[c];
 for (c = 0; c < n; c++)
 a[c] = b[c];
 printf("Reverse array is\n");
 for (c = 0; c < n; c++)
 printf("%d\n", a[c]);
 return 0;
}
```

Practice 4

Write a C program to put even and odd elements of an array in two separate arrays.

Sample Code

```
#include <stdio.h>
void main(){
int ARR[10], OAR[10], EAR[10];
int i, j = 0, k = 0, n;
printf("Enter the size of array AR \n");
scanf("%d", &n);
printf("Enter the elements of the array \n");
for (i = 0; i < n; i++){
scanf("%d", &ARR[i]);}
for (i = 0; i < n; i++)
   {
      if (ARR[i] % 2 == 0)
      {
         EAR[j] = ARR[i];
         j++;
      }
      else
      {
         OAR[k] = ARR[i];
         k++;
      }
   }
   printf("The elements of OAR are \n");
   for (i = 0; i < j; i++)
   {
      printf("%d\n", OAR[i]);
   }
   printf("The elements of EAR are \n");
   for (i = 0; i < k; i++)
   {
```

```
      printf("%d\n", EAR[i]);
   }
}
```

Practice 5

Write a C program to sort elements of an array in ascending order.

Sample Code

```
#include <stdio.h>
void main( ){
int i, j, a, n, number[30];
printf("Enter the value of N \n");
scanf("%d", &n);
printf("Enter the numbers \n");
for (i = 0; i < n; ++i)
scanf("%d", &number[i]);
for (i = 0; i < n; ++i){
for (j = i + 1; j < n; ++j){
if (number[i] > number[j]){
a =  number[i];
number[i] = number[j];
number[j] = a;
     }
     }
     }
printf("The numbers arranged in ascending order are given below \n");
for (i = 0; i < n; ++i)
printf("%d\n", number[i]);}
```

Do it yourself

Write a C program to sort elements of an array in descending order.

Practice 6

Write a C program to find sum of two matrix of order 2*2 using multidimensional arrays where, elements of matrix are entered by user.

Sample Code

```
#include <stdio.h>
int main(){
  float a[2][2], b[2][2], c[2][2];
  int i,j;
  printf("Enter the elements of 1st matrix\n");
```

```
    for(i=0;i<2;++i)
        for(j=0;j<2;++j){
        printf("Enter a%d%d: ",i+1,j+1);
        scanf("%f",&a[i][j]);
        }
    printf("Enter the elements of 2nd matrix\n");
    for(i=0;i<2;++i)
        for(j=0;j<2;++j){
        printf("Enter b%d%d: ",i+1,j+1);
        scanf("%f",&b[i][j]);
        }
    for(i=0;i<2;++i)
        for(j=0;j<2;++j){
/* Writing the elements of multidimensional array using loop. */
        c[i][j]=a[i][j]+b[i][j];
        }
    printf("\nSum Of Matrix:");
    for(i=0;i<2;++i)
        for(j=0;j<2;++j){
        printf("%.1f\t",c[i][j]);
            if(j==1)
               printf("\n");
       }
return 0;
}
```

Sample Output

```
Enter the elements of 1st matrix
Enter a11: 2;
Enter a12: 0.5;
Enter a21: -1.1;
Enter a22: 2;
Enter the elements of 2nd matrix
Enter b11: 0.2;
Enter b12: 0;
Enter b21: 0.23;
Enter b22: 23;

Sum Of Matrix:
2.2     0.5
-0.9    25.0
```

Do it yourself

Write a C program to draw a multiplication table using two dimensional array.

Exercises

- **Write a C program to find the transpose of a matrix.**
- **The annual examination result of 20 students are tabulated as follow:**
  Roll no. Sub1 Sub2 Sub3

  Write a C program to read the data and determine the followings:
  a) **Total marks obtained by each student**
  b) **The highest mark in each subject and the roll no. of the student who obtained it.**
  c) **The student who obtained the highest total marks.**