

NUST-SMME-
CS-114 Fundamentals of Programming Lab Manual #07

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Name: - Mohammad Abdullah Tahseen

Qalam ID: - 462573

BE-ME15 Section: - A

Course Instructor: Dr. Jawad Khan

Lab Instructor: Muhammad Affan

Lab Manual-7- Lab Tasks (Arrays)

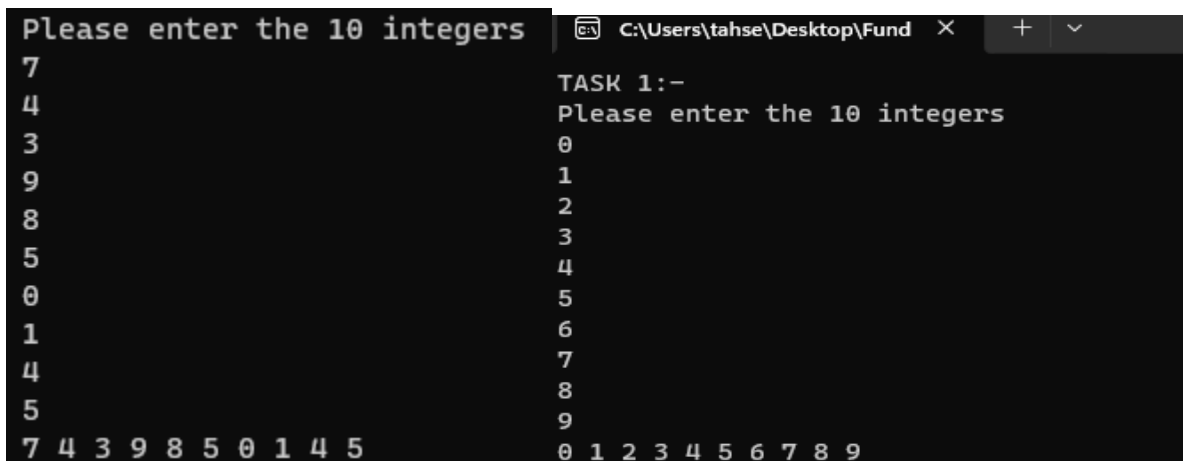
Task 1:

Q. Take 10 integer inputs from user and store them in an array and print them on screen.

```
#include<iostream>
using namespace std;
int main(){
    cout<<"TASK 1:- "<<endl;
    int num;
    int a[10]; //Declaring an array containing 10 integer elements
    cout<<"Please enter the 10 integers\n";
    //Entering all 10 integers to the array from 0th to 9th position respectively
    for(int i=0; i<10; i++)
    {
        cin>>num;
        a[i]=num;
    }
    if(i==9)
    //Nested loop to display the elements of the array when all elements have been entered by the user
    for(int j=0; j<10; j++){
        cout<<a[j]<<' ';
    }

    //END OF TASK 1
```

OUTPUT: -



The screenshot shows a Windows command prompt window with the title bar 'C:\Users\tahse\Desktop\Fund'. The program prompts the user to 'Please enter the 10 integers'. The user enters the following sequence of numbers: 7, 4, 3, 9, 8, 5, 0, 1, 4, 5. The program then displays 'TASK 1:-' followed by 'Please enter the 10 integers' and lists the indices 0 through 9. Below the indices, the corresponding array elements are printed: 0 1 2 3 4 5 6 7 8 9.

Task 2:

Q. Write a program to find the sum and product of all elements of an array with 5 integer elements.

```

//END OF TASK 1

cout<<"\nTASK 2:-"<<endl;
int b[5]; //Array has 5 integer elements as given in question statement
cout<<"Please input the integers in your array"<<endl;
//Entering values of elements in the array
for(int i=0; i<5; i++){
    cin>>num;
    b[i]= num; }
//After array of 5 integers is made, sum and product of all 5 element is found
int sum=0, product=1;
for(int j=0; j<5; j++){
    //progressively adding each element to the next, gives sum
    sum = sum + b[j];
    //progressively multiplying each element to the next, gives product
    product = product*b[j]; }
cout<<"The product of all integers of the array is: "<<product<<endl;
cout<<"The sum of all integers of the array is: "<<sum<<endl;

//END OF TASK 2

```

OUTPUT: -

```

TASK 2:-
Please input the integers in your array
2
3
4
5
6
The product of all integers of the array is: 720
The sum of all integers of the array is: 20

```

```

TASK 2:-
Please input the integers in your array
0
1
2
3
4
The product of all integers of the array is: 0
The sum of all integers of the array is: 10

```

Task 3:

Q.Print diamond pattern using a single array

```

cout<<"\nTASK 3:- "<<endl;
//Creating a diamond
int n;
cout<<"Enter the size of the diamond:(The total number of columns)\n";
cin>>n;
//Checking for even number entered since the code will not work for even number
if (n % 2 == 0) {
    cout<<"Please enter an odd number for the size of the diamond."<<endl;
}
else {

    //Create an array to represent the diamond
    char diamondArray[n*n];

    //Initialise the array with spaces
    for(int i=0; i<n*n; i++) {
        diamondArray[i] = ' ';
    }

    //Fill the upper half of the diamond
    for(int i=0; i<n/2 +1; i++) {
        for (int j = (n / 2) - i; j <= (n / 2) + i; j++) {
            diamondArray[i * n + j]='*';
        }
    }

    //Fill the lower half of the diamond
    for(int i=n/2+1; i<n; i++) {
        //Fill the upper half of the diamond
        for(int i=0; i<n/2 +1; i++) {
            for (int j = (n / 2) - i; j <= (n / 2) + i; j++) {
                diamondArray[i * n + j]='*';
            }
        }

        //Fill the lower half of the diamond
        for(int i=n/2+1; i<n; i++) {
            for (int j=i-(n / 2); j<=n-1-(i- (n/2)); j++) {
                diamondArray[i * n + j]='*';
            }
        }

        //Display the diamond
        for(int i=0; i<n; i++) {
            for (int j=0; j < n; j++) {
                cout<<diamondArray[i*n +j]<<' ';
            }
            cout <<endl;
        }
    }
    return 0;
}

```

OUTPUTS: -

```
TASK 3:-
Enter the size of the diamond:
6
Please enter an odd number for the size of the diamond.

-----
Process exited after 27.24 seconds with return value 0
Press any key to continue . . .
```

```
TASK 3:-
Enter the size of the diamond:
7
      *
    * * *
  * * * * *
* * * * * * *
  * * * * *
    * * *
      *
```

```
-----
```