Computer Practicum 1

Introduction to C

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Source: cprogramming.com, tutorialspoint.com, learn-c.org, fresh2refresh.com

Exercise 1

Write a program in C to read n number of values in an array and display it in reverse order.

Test Data :

```
Input the number of elements to store in
the array :3


Input 3 number of elements in the array:
element - 0 : 2
element - 1 : 5
element - 2 : 7
```

Expected Output :

```
The values store into the array are :
2 5 7
The values store into the array in
reverse are :
7 5 2
```

Exercise 2

Write a program in C to count a total number of duplicate elements in an array.

Test Data :

```
Input the number of elements to be
stored in the array :3
Input 3 elements in the array :
element - 0 : 5
element - 1 : 1
element - 2 : 1
```

Expected Output :

```
Total number of duplicate elements
found in the array is : 1
```

Exercise 3

Write a program in C to count the frequency of each element of an array.

Test Data :

```
Input the number of elements to be
stored in the array: 3
Input 3 elements in the array:
element - 0: 25
element - 1: 12
element - 2: 43
```

Expected Output :

```
The frequency of all elements of an
array:
25 occurs 1 times
12 occurs 1 times
43 occurs 1 times
```

Exercise 4

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

Exercise 5

Write a program in C for a 2D array of size 3x3 and print the matrix.

Test Data :

```
Input elements in the matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [0],[2] : 3
element - [1],[0] : 4
element - [1],[1] : 5
element - [1],[2] : 6
element - [2],[0] : 7
element - [2],[1] : 8
element - [2],[2] : 9
```

Expected Output :

```
The matrix is :

1 2 3
4 5 6
7 8 9
```

Exercise 6

Write a program in C for addition of two matrices of same size.

Test Data :

```
Input the size of the square matrix (less than 5): 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
```

Expected Output :

```
The First matrix is :
1 2
3 4


The Second matrix is :
5 6
7 8


The Addition of two matrices is :
6 8
10 12
```

Exercise 7

Write a program in C for multiplication of two square matrices.

Test Data :

```
Input the rows and columns of first matrix : 2 2
Input the rows and columns of second matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
```

Expected Output :

```
The First matrix is :
1 2
3 4


The Second matrix is :
5 6
7 8


The multiplication of two matrix is :
19 22
43 50
```

Exercise 8

Write a program in C to count the number of vowels and consonants in a string using a pointer.

Test Data :

```
Input a string: string
```

Expected Output :

```
Number of vowels : 1
Number of constant : 5
```

Exercise 9

Write a program in C to sort an array using Pointer.

Test Data :

```
Input the number of elements to store in the
array : 5
Input 5 number of elements in the array :
element - 1 : 25
element - 2 : 45
element - 3 : 89
element - 4 : 15
element - 5 : 82
```

Expected Output :

```
The elements in the array after sorting :
element - 1 : 15
element - 2 : 25
element - 3 : 45
element - 4 : 82
element - 5 : 89
```

Exercise 10

Write a programme for a real time calculator application. The programme should perform the below calculator operations:

- Addition
- Subtraction
- Multiplication
- Division
- Modulus
- Power
- Factorial

The user is prompted to choose the operations(i.e. addition, subtraction etc.) to be performed and then prompted to key in the values which are used to perform the operations.

The result is shown as an output to the user.

(see example)

```
            Welcome to C calculator

******** Press 'Q' or 'q' to quit the program *********
****** Press 'H' or 'h' to display below options ******

Enter 'C' or 'c' to clear the screen and display available option

Enter + symbol for Addition
Enter - symbol for Subtraction
Enter * symbol for Multiplication
Enter / symbol for Division
Enter ? symbol for Modulus
Enter ^ symbol for Power
Enter ! symbol for Factorial


Enter the calculator Operation you want to do: : +
Enter the number of elements you want to add : 3
Please enter 3 numbers one by one:
10
20
30
Sum of 3 numbers = 60

Enter the calculator Operation you want to do: : -
Please enter first number  : 40
Please enter second number : 25

40 - 25 = 15

Enter the calculator Operation you want to do: : *
Please enter first numb   : 3
Please enter second number: 6

Multiplication of entered numbers = 18

Enter the calculator Operation you want to do: : /
Please enter first number  : 30
Please enter second number : 11
```