



Data Structure Lab

Lab-3

Submitted by:

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Q1. WAP to enter numbers till the user wants. At the end, it should display the count of positive, negative, and Zeroes entered.

```
#include <stdio.h>

int main()
{
    int positive_count = 0;
    int negative_count = 0;
    int zero_count = 0;
    float num;
    char user_choice = 'y';

    while (user_choice == 'y' || user_choice == 'Y')
    {
        printf("Enter a number: ");
        scanf("%f", &num);

        if (num > 0)
        {
            positive_count++;
        }
        else if (num < 0)
        {
            negative_count++;
        }
        else
        {
            zero_count++;
        }

        printf("Do you want to enter another number? (y/n): ");
        scanf(" %c", &user_choice);
    }

    printf("Count of positive numbers: %d\n", positive_count);
    printf("Count of negative numbers: %d\n", negative_count);
    printf("Count of zeros: %d\n", zero_count);

    return 0;
}
```

```
PS D:\MCA\MCA-DSA> cd .\LAB-3\  
PS D:\MCA\MCA-DSA\LAB-3> gcc .\Question1.c  
PS D:\MCA\MCA-DSA\LAB-3> .\a.exe  
Enter a number: 1  
Do you want to enter another number? (y/n): y  
Enter a number: -2  
Do you want to enter another number? (y/n): y  
Enter a number: 0  
Do you want to enter another number? (y/n): n  
Count of positive numbers: 1  
Count of negative numbers: 1  
Count of zeros: 1  
PS D:\MCA\MCA-DSA\LAB-3> █
```

Q2. WAP to print the multiplication table of the number entered by the user. It should be in the correct formatting.

```
#include <stdio.h>  
void main()  
{  
    /* By using For loop  
  
    // int number;  
    // printf("Enter the number :");  
    // scanf("%d", &number);  
    // for (int i = 1; i <= 10; i++)  
    // {  
    //     printf("%d x %d = %d\n", number, i, number * i);  
    // }  
  
    /*By using while loop  
  
    // int number;  
    // printf("Enter the number :");  
    // scanf("%d", &number);  
    // int i = 1;  
    // while (i <= 10)  
    // {  
    //     printf("%d x %d = %d\n", number, i, number * i);  
    //     i++;  
    // }
```

```
/*By using do while loop

int number;
printf("Enter the number :");
scanf("%d", &number);
int i = 1;
do
{
    printf("%d x %d = %d\n", number, i, number * i);
    i++;
} while (i <= 10);
}
```

```
PS D:\MCA\MCA-DSA\LAB-3> gcc .\Question2.c
PS D:\MCA\MCA-DSA\LAB-3> .\a.exe
Enter the number :5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
PS D:\MCA\MCA-DSA\LAB-3> █
```

Q3. WAP to generate the following set of output.

```
#include <stdio.h>
void main()
{
    // Pattern 1
    int count = 1;
    for (int i = 0; i <= 3; i++)
    {
        for (int j = 1; j <= i; j++)
        {
            printf("%d", count);
            count++;
        }

        printf("\n");
    }
}
```

```
// Pattern 2
int num;
printf("Enter the number of rows :");
scanf("%d", &num);
for (int i = 0; i < num; i++)
{
    int value = 1;
    for (int j = 0; j <= i; j++)
    {
        printf("%d", value);
        value = value * (i - j) / (j + 1);
    }
    printf("\n");
}
}
```

```
PS D:\MCA\MCA-DSA\LAB-3> gcc .\Question3.c
PS D:\MCA\MCA-DSA\LAB-3> .\a.exe
```

```
1
23
456
Enter the number of rows :5
1
11
121
1331
14641
PS D:\MCA\MCA-DSA\LAB-3> █
```

Q4. The population of a town is 100000. The population has increased steadily at the rate of 10% per year for the last 10 years. Write a program to determine the population at the end of each year in the last decade.

```
#include <stdio.h>
void main()
{
    int initial_population = 100000;
    double growth_rate = 0.10;
    int years = 10;
    int population;
    for (int i = 0; i < years; i++)
    {
        population = 100000 + (int)(initial_population * growth_rate);
        printf("%d \t %d\n", i, population);
    }
}
```

```
        initial_population = population;
    }
}
```

```
14041
PS D:\MCA\MCA-DSA\LAB-3> gcc .\Question4.c
PS D:\MCA\MCA-DSA\LAB-3> .\a.exe
0      110000
1      111000
2      111100
3      111110
4      111111
5      111111
6      111111
7      111111
8      111111
9      111111
```

Q5. Ramanujan Number is the smallest number that can be expressed as the sum of two cubes in two different ways. WAP to print all such numbers up to a reasonable limit.

```
#include <stdio.h>

int main()
{
    int i, num, x, y, count;
    printf("Enter the range in which you find the number:");
    scanf("%d", &num);
    for (i = 1; i <= num; i++)
    {
        count = 0;
        for (x = 1; x * x * x < i; x++)
        {
            for (y = x; x * x * x + y * y * y <= i; y++)
            {
                if (x * x * x + y * y * y == i)
                {
                    count++;
                }
            }
        }
        if (count == 2)
        {
            printf("%d\n", i);
        }
    }
}
```

```
}  
}
```

```
PS D:\MCA\MCA-DSA\LAB-3> gcc .\Question5.c  
PS D:\MCA\MCA-DSA\LAB-3> .\a.exe  
Enter the range in which you find the number:2000  
1729  
PS D:\MCA\MCA-DSA\LAB-3> .\a.exe  
Enter the range in which you find the number:5000  
1729  
4104
```