Module 2

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[Q_1] Research and provide three real-world applications where C programming is extensively used, such as in embedded systems, operating systems, or game development.

[Q_2] Install a C compiler on your system and configure the IDE. Write your first program to print "Hello, World!" and run it.

[Q_3] Write a C program that includes variables, constants, and comments. Declare and use different data types (int, char, float) and display their values.

```
#include <stdio.h>
int main()
{
   int n1;
   printf("Enter Intger The Numerical Value Of N1:\t");
   scanf("%d", &n1);
   printf("The Intger Numerical Value Of N1 Is: %d", n1);
   printf("\n");
   float n2;
   printf("\nEnter Float The Numerical Value Of N2:\t");
   scanf("%f", &n2);
   printf("The Float Numerical Value Of N2 Is: %.2f", n2);
   printf("\n");
   char c = 'A';
   printf("\nThe Character  Of c Is: %c", c);

   return 0;
```

```
}
```

OUTPUT:-

```
Enter Intger The Numerical Value Of N1: 20
The Intger Numerical Value Of N1 Is: 20

Enter Float The Numerical Value Of N2:  143.13
The Float Numerical Value Of N2 Is: 143.13

The Character  Of c Is: A
```

[Q_4] Write a C program that accepts two integers from the user and performs arithmetic, relational, and logical operations on them. Display the results.

```
#include <stdio.h>
int main()
{
   int n1, n2;
   printf("Enter The Numerical Value Of N1:\t");
   scanf("%d", &n1);
   printf("Enter The Numerical Value Of N2:\t");
   scanf("%d", &n2);

   printf("\n-----------------------");
   // Arethmatic Operaters
   printf("\nArithmeric Operaters");
   printf("\nThe Addition Of  %d and  %d is : %d", n1, n2, n1 + n2);
   printf("\nThe Subtraction Of  %d and  %d is : %d", n1, n2, n1 - n2);
   printf("\nThe Multiplication Of  %d and  %d is : %d", n1, n2, n1 * n2);
   printf("\nThe Division Of  %d and  %d is : %d", n1, n2, n1 / n2);
```

```
    printf("\nThe Modulo Of  %d and  %d is : %d", n1, n2, n1 % n2);


    printf("\n------------------------");

    // Relational Operaters

    printf("\nRelational Operaters");

    printf("\nThe Eqale Relational Operaters Of  %d ==  %d : %s ", n1, n2, (n1
== n2) ? "True" : "False");

    printf("\nThe Not Eqale Relational Operaters Of Of  %d !=  %d : %s ", n1,
n2, (n1 != n2) ? "True" : "False");

    printf("\nThe Greater Than Relational Operaters Of Of  %d >  %d: %s ", n1,
n2, (n1 > n2) ? "True" : "False");

    printf("\nThe Less Than Relational Operaters Of Of  %d <  %d : %s ", n1, n2,
(n1 < n2) ? "True" : "False");


    printf("\n------------------------");

    // Logical Operaters

    printf("\nLogical Operaters");

    printf("\nThe && Logical Operaters Of  %d > 0 &&  %d> 0 : %s ", n1, n2,
(n1 > 0 && n2 > 0) ? "True" : "False");

    printf("\nThe || Eqale Logical Operaters Of Of  %d > 0 ||  %d > 0 : %s", n1,
n2, (n1 > 0 || n2 > 0) ? "True" : "False");

    // printf("\nThe ! Logical Operaters Of Of  %d > 0 ! %d > 0 %s ", n1, n2,
(n1>0 ! n2>0) ? "True" : "False");


    return 0;

}
```

OUTPUT :

```
Enter The Numerical Value Of N1:        10

Enter The Numerical Value Of N2:        5
```

```
-----------------------
Arithmeric Operaters
The Addition Of  10 and  5 is : 15
The Subtraction Of  10 and  5 is : 5
The Multiplication Of  10 and  5 is : 50
The Division Of  10 and  5 is : 2
The Modulo Of  10 and  5 is : 0
-----------------------
Relational Operaters
The Eqale Relational Operaters Of  10 ==  5 : False
The Not Eqale Relational Operaters Of Of  10 !=  5 : True
The Greater Than Relational Operaters Of Of  10 >  5: True
The Less Than Relational Operaters Of Of  10 <  5 : False
-----------------------
Logical Operaters
The && Logical Operaters Of  10 > 0 &&  5> 0 : True
The || Eqale Logical Operaters Of Of  10 > 0 ||  5 > 0 : True
```

[Q_5] Write a C program to check if a number is even or odd using an if-else statement. Extend the program using a switch statement to display the month name based on the user's input (1 for January, 2 for February, etc.).

```
#include <stdio.h>
int main()
{
   int n1,ch;
   printf("\nOdd OR Even Number Display");
   printf("\nEnter The Numerical Value Of N1:\t");
   scanf("%d", &n1);
```

```
printf("\n--------");
if (n1 % 2 == 0)
{
   printf("\n%d Is Even Number.", n1);
}
else
{
   printf("\n%d Is Odd Number.", n1);
}

printf("\n--------");
printf("\nUsing Swtich Case Statement Dispaly The Month");
printf("\nEnter 1 for January");
printf("\nEnter 2 for February");
printf("\nEnter 3 for March");
printf("\nEnter 4 for April");
printf("\nEnter 5 for May");
printf("\nEnter 6 for June");
printf("\nEnter 7 for July");
printf("\nEnter 8 for August");
printf("\nEnter 9 for September");
printf("\nEnter 10 for October");
printf("\nEnter 11 for November");
printf("\nEnter 12 for December");
printf("\n\n");
printf("Enter Your Choice:");
```

```
scanf("%d",&ch);

switch (ch)
{
case 1:
   printf("January");
   break;

case 2:
   printf("ebruary");
   break;
case 3:
   printf("March");
   break;
case 4:
   printf("April");
   break;
case 5:
   printf("May");
   break;
case 6:
   printf("June");
   break;
case 7:
   printf("July");
   break;
case 8:
```

```
        printf("August");
        break;
    case 9:
        printf("September");
        break;
    case 10:
        printf("October");
        break;
    case 11:
        printf("November");
        break;
    case 12:
        printf("December");
        break;

    default:
    printf("Invaliud Choice...!");
        break;
    }
    return 0;
}
```

OUTPUT :

```
Odd OR Even Number Display
Enter The Numerical Value Of N1:        12

--------
12 Is Even Number.
```

Using Swtich Case Statement Dispaly The Month

Enter 1 for January

Enter 2 for February

Enter 3 for March

Enter 4 for April

Enter 5 for May

Enter 6 for June

Enter 7 for July

Enter 8 for August

Enter 9 for September

Enter 10 for October

Enter 11 for November

Enter 12 for December

Enter Your Choice:9

September

[Q_6] Write a C program to print numbers from 1 to 10 using all three types of loops (while, for, do-while).

```
#include <stdio.h>
int main()
{
   int i;
   printf("Using For Loop Print The 1 - 10 Numerical Value:");
   for (i = 1; i <= 10; i++)
   {
      printf("\n%d", i);
```

```
    }

    printf("\n-----------------------------------------------------");
    printf("\nUsing While Loop Print The 1 - 10 Numerical Value:");
    i = 1;
    while (i <= 10)
    {
        printf("\n%d", i);
        i++;
    }

    printf("\n-----------------------------------------------------");
    printf("\nUsing Do-While Loop Print The 1 - 10 Numerical Value:");
    i = 1;
    do
    {
        printf("\n%d", i);
        i++;
    } while (i <= 10);

    return 0;
}
```

OUTPUT :

```
Using For Loop Print The 1 - 10 Numerical Value:
1
2
3
```

4

5

6

7

8

9

10

Using While Loop Print The 1 - 10 Numerical Value:

1

2

3

4

5

6

7

8

9

10

Using Do-While Loop Print The 1 - 10 Numerical Value:

1

2

3

4

5

6

7

8

9

10

[Q_7] Write a C program that uses the break statement to stop printing numbers when it reaches 5. Modify the program to skip printing the number 3 using the continue statement.

```
#include <stdio.h>
int main()
{
    int n1, i;
    printf("Enter The Numerical Value Of N1:\t");
    scanf("%d", &n1);

    for (i = 1; i <= n1; i++)
    {
        if (i == 3)
        {
            continue;
        }
        printf("\n%d", i);
        if (i == 5)
        {
            break;
        }
    }

    return 0;
```

```
}
```

OUTPUT :

```
Enter The Numerical Value Of N1:        10


1
2
4
5
```

[Q_8] Write a C program that calculates the factorial of a number using a function. Include function declaration, definition, and call.

```
#include <stdio.h>
int fact(int n1)
{
   int i, f = 1;
   for (i = 1; i <= n1; i++)
   {
      f = f * i;
   }

   return f;
}
int main()
{
   int n1, ans;
   printf("Enter Your Numerical Value For N1:\t");
   scanf("%d", &n1);
```

```
    ans = fact(n1);
    printf("\n %d Factorial Number Is: %d", n1, ans);
    return 0;
}
```

OUTPUT :

```
Enter Your Numerical Value For N1:      6


 6 Factorial Number Is: 720
```

[Q_9] Write a C program that stores 5 integers in a one-dimensional array and prints them. Extend this to handle a two-dimensional array (3x3 matrix) and calculate the sum of all elements.

```
#include <stdio.h>
int main()
{
    // One Dimentional Array
    int a[100], i,b[100][100], c[100][100], size, sum[100][100], j, h, v;
    for (i = 0; i < 5; i++)
    {
        printf("Enter The Array Of An Elements a[%d]:\t", i);
        scanf("%d", &a[i]);
    }
    printf("\n\nElements An Array of a is:");
    for (i = 0; i < 5; i++)
    {
        printf("\n%d", a[i]);
    }
```

```
// Two Dimentional Array
printf("\n----------------------------------------");

printf("\nEnter Row Number:\t");
scanf("%d", &v);
printf("\nEnter Col Number:\t");
scanf("%d", &h);
printf("\nEnter The Array Of An Size :\t");
scanf("%d", &size);
printf("\n");
for (i = 0; i < size; i++)
{
   for (j = 0; j < size; j++)
   {
      printf("\nEnter The Array Of An Elements b[%d][%d]:\t", i, j);
      scanf("%d", &b[i][j]);
   }
}
printf("\n");
for (i = 0; i < size; i++)
{
   for (j = 0; j < size; j++)
   {
      printf("\nEnter The Array Of An Elements c[%d][%d]:\t", i, j);
      scanf("%d", &c[i][j]);
   }
}
```

```
 printf("\n\n");
printf("\nElements Of An Array   B:");
 for (i = 0; i < size; i++)
 {
    for (j = 0; j < size; j++)
    {
       printf(" %d ", b[i][j]);
    }
    printf("\n");
 }
 printf("\n");
 printf("\nElements Of An Array   C:");
 for (i = 0; i < size; i++)
 {
    for (j = 0; j < size; j++)
    {
       printf(" %d ", c[i][j]);
    }
    printf("\n");
 }

 printf("\n\n");
 printf("\nThe Sum Of Array Elements B & C Is:");
 for (i = 0; i < size; i++)
 {
    for (j = 0; j < size; j++)
```

```
        {
            sum[i][j] = b[i][j] + b[i][j];
            printf(" %d ", sum[i][j]);
        }
        printf("\n");
    }

    return 0;
}
```

OUTPUT :

```
Enter The Array Of An Elements a[0]:    1
Enter The Array Of An Elements a[1]:    2
Enter The Array Of An Elements a[2]:    3
Enter The Array Of An Elements a[3]:    4
Enter The Array Of An Elements a[4]:    5


Elements An Array of a is:
1
2
3
4
5
----------------------------------------
Enter Row Number:       3

Enter Col Number:       3
```

Enter The Array Of An Size : 3

Enter The Array Of An Elements b[0][0]: 1

Enter The Array Of An Elements b[0][1]: 2

Enter The Array Of An Elements b[0][2]: 3

Enter The Array Of An Elements b[1][0]: 4

Enter The Array Of An Elements b[1][1]: 5

Enter The Array Of An Elements b[1][2]: 6

Enter The Array Of An Elements b[2][0]: 7

Enter The Array Of An Elements b[2][1]: 8

Enter The Array Of An Elements b[2][2]:9

Enter The Array Of An Elements c[0][0]: 1

Enter The Array Of An Elements c[0][1]: 2

Enter The Array Of An Elements c[0][2]: 3

Enter The Array Of An Elements c[1][0]: 4

Enter The Array Of An Elements c[1][1]: 5

Enter The Array Of An Elements c[1][2]: 6

Enter The Array Of An Elements c[2][0]: 7

Enter The Array Of An Elements c[2][1]: 8

Enter The Array Of An Elements c[2][2]: 9

Elements an Array Of B:

1 2 3

4 5 6

7 8 9

Elements an Array Of C:

1 2 3

4 5 6

7 8 9

The Sum Of Array Elements B & C Is:

2 4 6

8 10 12

14 16 18

[Q_10] Write a C program to demonstrate pointer usage. Use a pointer to modify the value of a variable and print the result.

[Q_11] Write a C program that takes two strings from the user and concatenates them using strcat(). Display the concatenated string and its length using strlen().

```
#include <stdio.h>
#include <string.h>
int main()
{
   char s1[100], s2[100], s3[200];
   printf("Enter Your First String Name:\t");
   gets(s1);
   printf("Enter Your Second String Name:\t");
   gets(s2);

   strcat(s1, s2);
   printf("\nThe String After Using strcat() is : %s ",s1);

   int len = strlen(s1);
   printf("\nThe Length Of strcat() String is %d ",len);
   return 0;
}
```

OUTPUT :

```
Enter Your First String Name:   Hello!
Enter Your Second String Name:  How Are You?

The String After Using strcat() is : Hello!How Are You?
The Length Of strcat() String is  18
```