Module 2 – Introduction to Programming

/ LAB TASK-2 /

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.

ANS :

1. Embedded system : Automotive software
2. Operating system : Windows, linux
3. Game development : Doom

Q-2 : Install a C compiler on your system and configure the IDE. Write your first program to print "Hello, World!" and run it.

ANS :

```
#include<stdio.h>
Int main()
{
printf("\n Hello World");
Return 0;
}
```

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.

ANS :

```
#include<stdio.h>
#define pie 3.14
int main()
{
int p1 = 10;
char p2 = 'a';
float p3 = 10.5;

// Here take n1 for the any numerical value,
// Take n2 for the alphabetic value
// Take n3 for float value
// Take pie for constant
printf("\n the value of p1 = %d ",p1);
printf("\n The value of p2 = %c",p2);
printf("\n The value of p3 = %.2f",p3);
printf("\n the value of pie = %.2f",pie);
return 0;
}
```

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.

ANS :

```
#include<stdio.h>
int main()
```

```
{
 int n1,n2;

 printf("\n The value of no1 = ");
 scanf("%d",&no1);
 printf("\n The value of no2 = ");
 scanf("%d",&no2);

 // Arithmetic

 printf("\n The Addition of %d and %d is %d",no1,no2,no1+no2);
 printf("\n The Subtraction of %d and %d is %d",no1,no2,no1-no2);
 printf("\n The multiplication of %d and %d is %d",no1,no2,no1*no2);
 printf("\n The division of %d and %d is
%.2f",no1,no2,(float)no1/(float)no2);

 // Relational operator

 printf("\n\n no1>no2 : %d",no1>no2);
 printf("\n no1<no2 : %d",no1<no2);
 printf("\n no1<=no2 : %d",no1<=no2);
 printf("\n no1>=no2 : %d ",no1>=no2);
 printf("\n no1==no2 : %d",no1==no2);
 printf("\n no1!=no2 : %d",no1!=no2);

 //logical operator

 printf("\n\n no1>0 && no2>0 : %d",no1>0 && no2>0);
 printf("\n no1>0 || no2<0 : %d",no1>0 || no2<0);
 printf("\n !(no1>0) :%d",!(no1>0));
```

```
 return 0;
}
```

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.).

ANS :

```
#include<stdio.h>
int main()
{
 int a;
 up:
 printf("\n Enter the value = ");
 scanf("%d",&a);
 if(a%2==0)
 {
 printf("\n\n %d is the even number",a);
 }
 else
 {
 printf("\n\n %d is the odd Number",a);
 }

 switch(a)
 {
 case 1 :
 printf("\n %d for January ",a);
 break;
 case 2 :
```

```
printf("\n %d for February",a);
break;
case 3 :
printf("\n %d for March",a);
break;
case 4 :
printf("\n %d for April",a);
break;
case 5 :
printf("\n %d for May",a);
break;
case 6 :
printf("\n %d for June",a);
break;
case 7 :
printf("\n %d for July",a);
break;
case 8 :
printf("\n %d for August",a);
break;
case 9 :
printf("\n %d for September",a);
break;
case 10 :
printf("\n %d for October",a);
break;
case 11 :
printf("\n %d for November",a);
break;
case 12 :
printf("\n %d for December",a);
```

```
 break;
 }
 goto up;
 return 0;
}
```

Q-6 : Write a C program to print numbers from 1 to 10 using all three types of loops (while, for, do-while).

ANS :

```
#include<stdio.h>
int main()
{
 int i;
 printf("\n\n For loop :=");

 for(i=1;i<=10;i++)
 {
 printf("\n%d",i);
 }

 printf("\n\n while loop :=");
 i=1;
 while(i<=10)
 {
 printf("\n%d",i);
 i++;
 }

 printf("\n\n do while loop :=");
```

```
i=1;
do
{
printf("\n%d",i);
i++;
}
while(i<=10);
return 0;
}
```

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.

ANS :

```
#include<stdio.h>
int main()
{
 int n,i;
 printf("\n Enter the value of m = ");
 scanf("%d",&m);
 for(i=1;i<=m;i++)
 {
 if(i%3==0)
 {
 continue;
 }
```

```
 if(i%5==0)
 {
 break;
 }
 printf("%d \n",i);
 }
 return 0;
}
```

Q-8 : Write a C program that calculates the factorial of a number using a function.

Include function declaration, definition, and call.

ANS :

```
#include<stdio.h>
// Without return type with argument
int fact(int n1);      //Declaration
int fact(int n1)     //definition
{
 int ans,i;
 for(i=1;i<=n1;i++)
 {
 ans = ans * i;
 }
 printf("\n The factorial of %d is = %d",n1,ans);
}
int main()
{
```

```
 int number1;
 printf("\n The value of number1 = ");
 scanf("%d",&number1);
 fact(number1);//calling
 return 0;
}
```

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.

ANS :

```
#include<stdio.h>
int main()
{
int c[5],i;
for(i=0;i<5;i++)
{
printf("\n Enter the element c[%d] = ",i);
scanf("%d",&c[i]);
}
printf("\n Array = ");
for(i=0;i<5;i++)
{
printf("%d ",c[i]);
```

```
}
int a[3][3],b[3][3],j,sum=0;
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
printf("\n Enter the element a[%d][%d] = ",i,j);
scanf("%d",&a[i][j]);
}
}
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
printf("\n Enter the element b[%d][%d] = ",i,j);
scanf("%d",&b[i][j]);
}
}
printf("\n 1st \t 2nd \t =sum\n");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
printf("%d ",a[i][j]);
}
printf("\t");
for(j=0;j<3;j++)
{
printf("%d ",b[i][j]);
}
printf("\t");
```

```
for(j=0;j<3;j++)
{
sum = a[i][j]+b[i][j];
printf("%2d ",sum);
}
printf("\n");
}
return 0;
}
```

Q-10 : Write a C program to demonstrate pointer usage. Use a pointer to modify the value of a variable and print the result.

ANS :

```
#include <stdio.h>
int main()
{
 int a[50];
 int *ptr = &a;
 printf("\n Enter the value of a = ");
 scanf("%d",&a);
 printf("\n The address of a = %p ",ptr);
 printf("\n The value of a = %d ",*ptr);

 return 0;
}
```

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().

ANS :

```
#include <stdio.h>
#include<string.h>
int main()
{
 char a1[100],a2[100];
 printf("\n Enter the string a1 = ");
 gets(a1);
 printf("\n Enter the string a2 = ");
 gets(a2);

 printf("\n String a1 = %s",a1);
 printf("\n String a2 = %s",a2);
 strcat(a1,a2);
 printf("\n After using concat string 1 = %s",a1);
 printf("\n After using concat string 2 = %s",a2);
 int length = strlen(a1);
 printf("\n After using length of string 1 = %d ",length);
 printf("\n After using length of string 2 = %d ",strlen(a2));
 return 0;
}
```

Q-12 : Write a C program that defines a structure to store a student's details (name, roll number, and marks). Use an array of structures to store details of 3 students and print them.

ANS :

```
#include<stdio.h>
int main()
{
int n,i,ans,sum=0;
printf ("\n Enter the value of n = ");
scanf ("%d",&n);
printf ("\n square natural upto %d terms are : ",n);
for (i=1 ;i<=n; i++)
{
ans = I * i;
printf (" %d ",ans);
sum = sum + ans;
}
Printf ("\n Sum of Square Natural Number upto %d terms = %d",n,sum)
return 0;
}
```

(13) Write a C program to create a file, write a string into it, close the file, then open the file again to read and display its contents.

Ans.

```
#include <stdio.h>
int main()
{
 FILE *fp1;
 char text[100];
 fp1 = fopen("second.txt","w");
```

```
 fprintf (fp1,"\n name of student.");
 fprintf (fp1,"\n mihir patel \n meet nayak \n nisarg patel \n jay patel");
 fclose(fp1);
 fp1 = fopen ("second.txt","r");
 while(fgets(text,sizeof(text),fp1));
{
 printf ("%s",&text);
 }
 fclose(fp1);
 printf ("\n operation sucessfull");
 return 0;
}
```

THANK YOU