

**State Institute Of Engineering And Technology, Nilokheri
(Karnal)**

Department of CSE (AIML)



Lab Manual

“Programming For Problem Solving”

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Program-1a

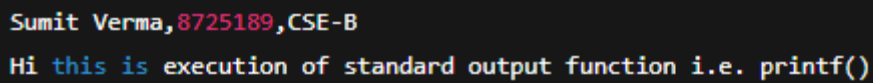
Aim : Write a program for using the standard output function (printf()).

Program :

```
#include<stdio.h>

void main ()
{
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Hi this is execution of standard output function i.e. printf()");
}
```

Output:

A screenshot of a terminal window showing the output of the program. The first line is "Sumit Verma,8725189,CSE-B" and the second line is "Hi this is execution of standard output function i.e. printf()".

```
Sumit Verma,8725189,CSE-B
Hi this is execution of standard output function i.e. printf()
```

Program-1b

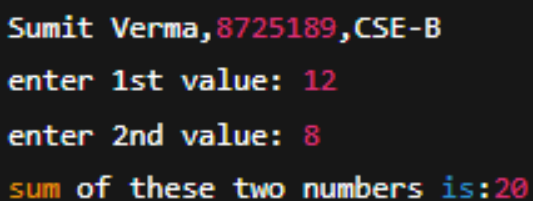
Aim : Write a program to add two numbers.

Program :

```
#include<stdio.h>

void main ()
{
    int a,b,c;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter 1st value:");
    scanf("%d",&a);
    printf("enter 2nd value:");
    scanf("%d",&b);
    c=a+b;
    printf("sum of these two numbers is:%d",c);
}
```

Output:

A screenshot of a terminal window showing the output of the program. The first line is "Sumit Verma,8725189,CSE-B". The second line is "enter 1st value: 12". The third line is "enter 2nd value: 8". The fourth line is "sum of these two numbers is:20".

```
Sumit Verma,8725189,CSE-B
enter 1st value: 12
enter 2nd value: 8
sum of these two numbers is:20
```

Program-1c

Aim : Write a program to show run time as well as compile time initialization of a variable.

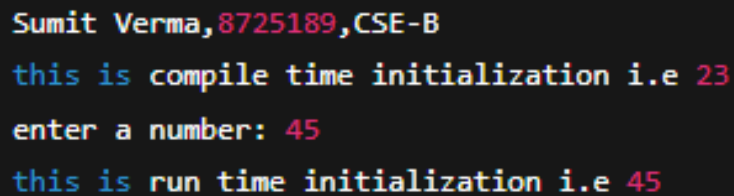
Program :

```
#include<stdio.h>

void main ()
{
    int a=23,b;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("this is compile time initialization i.e %d \n",a);

    printf("enter a number:");
    scanf("%d",&b);
    printf("this is run time initialization i.e %d",b);
}
```

Output:

A screenshot of a terminal window showing the output of the C program. The output consists of four lines: 'Sumit Verma,8725189,CSE-B' (with '8725189' in red), 'this is compile time initialization i.e 23' (with '23' in red), 'enter a number: 45' (with '45' in red), and 'this is run time initialization i.e 45' (with '45' in red).

```
Sumit Verma,8725189,CSE-B
this is compile time initialization i.e 23
enter a number: 45
this is run time initialization i.e 45
```

Program-2a

Aim : Write a program to use all arithmetic operators(+ , - , * , / , %).

Program :

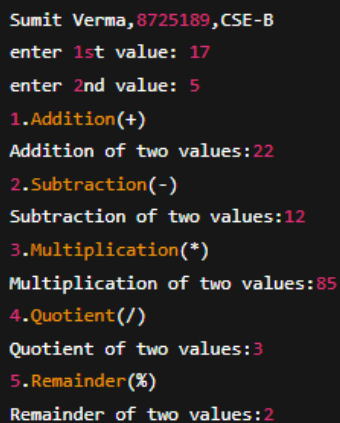
```
#include<stdio.h>

void main (){
    int a,b,c;

    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter 1st value:");
    scanf("%d",&a);
    printf("enter 2nd value:");
    scanf("%d",&b);
    printf("1.Addition(+)\n");
    c=a+b;
    printf("Addition of two values:%d\n",c);
    printf("2.Subtraction(-)\n");
    c=a-b;
    printf("Subtraction of two values:%d\n",c);
    printf("3.Multiplication(*)\n");
    c=a*b;
    printf("Multiplication of two values:%d\n",c);
    printf("4.Quotient(/)\n");
    c=a/b;
    printf("Quotient of two values:%d\n",c);
    printf("5.Remainder(%%)\n");
    c=a%b;

    printf("Remainder of two values:%d\n",c);}
```

Output:

A screenshot of a terminal window showing the output of the C program. The output is as follows:

```
Sumit Verma,8725189,CSE-B
enter 1st value: 17
enter 2nd value: 5
1.Addition(+)
Addition of two values:22
2.Subtraction(-)
Subtraction of two values:12
3.Multiplication(*)
Multiplication of two values:85
4.Quotient(/)
Quotient of two values:3
5.Remainder(%)
Remainder of two values:2
```

Program-2b

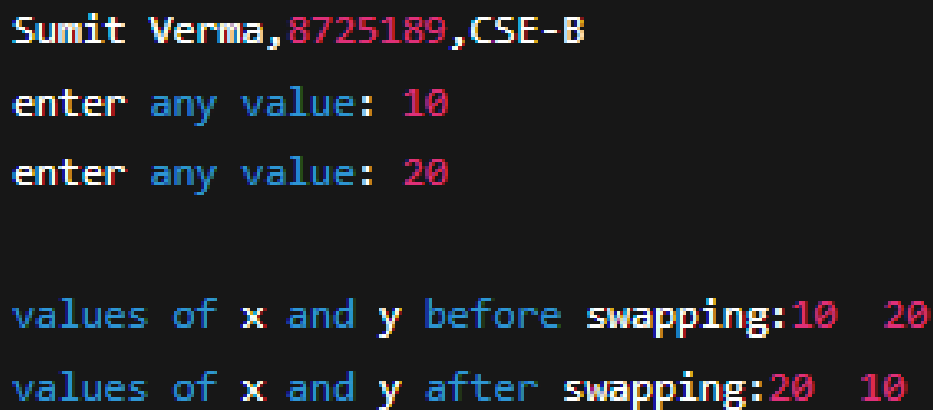
Aim : Write a program to swap using temporary or third variable.

Program :

```
#include<stdio.h>

void main ()
{
    int x,y,t;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter any value:");
    scanf("%d",&x);
    printf("enter any value:");
    scanf("%d",&y);
    printf("\n values of x and y before sWrite a programping:%d %d",x,y);
    t=x;
    x=y;
    y=t;
    printf("\n values of x and y after sWrite a programping:%d %d",x,y);
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output shows the program's execution: it prints a header line, prompts for two values (10 and 20), and then displays the values before and after swapping. The values are swapped from 10 and 20 to 20 and 10.

```
Sumit Verma,8725189,CSE-B
enter any value: 10
enter any value: 20

values of x and y before swapping:10 20
values of x and y after swapping:20 10
```

Program-2c

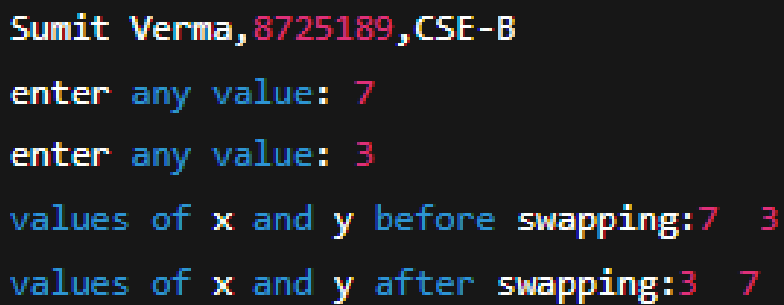
Aim : Write a program to swap numbers without using temporary or third variable.

Program :

```
#include<stdio.h>

void main ()
{
    int x,y;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter any value:");
    scanf("%d",&x);
    printf("enter any value:");
    scanf("%d",&y);
    printf("values of x and y before sWrite a programping:%d %d\n",x,y);
    x=x+y;
    y=x-y;
    x=x-y;
    printf("values of x and y after sWrite a programping:%d %d",x,y);
}
```

Output:

A screenshot of a terminal window showing the output of the C program. The text is as follows:
Sumit Verma,8725189,CSE-B
enter any value: 7
enter any value: 3
values of x and y before swapping:7 3
values of x and y after swapping:3 7
The numbers 7 and 3 are highlighted in red in the original image.

```
Sumit Verma,8725189,CSE-B
enter any value: 7
enter any value: 3
values of x and y before swapping:7 3
values of x and y after swapping:3 7
```


Program-3a

Aim : Write a program to determine if a number is even or odd.

Program :

```
#include<stdio.h>

void main ()
{
    int n;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter any number:");
    scanf("%d",&n);
    if (n%2==0)
    {
        printf("number is even i.e %d",n);
    }
    else
    {
        printf("number is odd i.e %d",n);
    }
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output shows three lines: 'Sumit Verma,8725189,CSE-B' on the first line, 'enter any number: 14' on the second line, and 'number is even i.e 14' on the third line.

```
Sumit Verma,8725189,CSE-B
enter any number: 14
number is even i.e 14
```

Program-3b

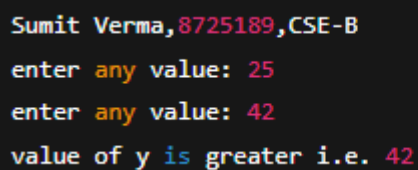
Aim : Write a program to find maximum of two numbers.

Program :

```
#include<stdio.h>

void main ()
{
    int x,y;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter any value:");
    scanf("%d",&x);
    printf("enter any value:");
    scanf("%d",&y);
    if(x>y)
    {
        printf("value of x is greater i.e. %d",x);
    }
    else
    {
        printf("value of y is greater i.e. %d",y);
    }
}
```

Output:

A screenshot of a terminal window showing the output of the C program. The text is as follows:
Sumit Verma,8725189,CSE-B
enter any value: 25
enter any value: 42
value of y is greater i.e. 42
The text is displayed in a monospaced font with some color coding: 'Sumit Verma,8725189,CSE-B' is in white, 'enter any value:' is in yellow, and the input values '25' and '42' are in red. The final output line 'value of y is greater i.e. 42' is in white.

Program-3c

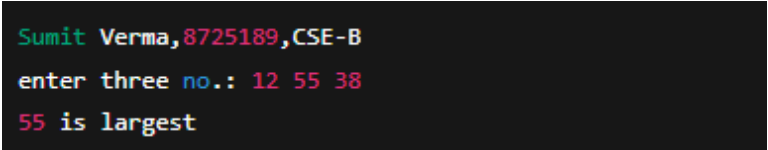
Aim : Write a program to find maximum of three numbers.

Program :

```
#include<stdio.h>

void main ()
{
    int x,y,z;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter three no.:");
    scanf("%d %d %d",&x,&y,&z);
    if(x>y){
        if(x>z)
        {
            printf("%d is largest",x);
        }
        else{
            printf("%d is largest ",z);
        }
    }
    else{
        if(y>z){
            printf("%d is largest",y);
        }
        else{
            printf("%d is largest",z);
        }
    }
}
```

Output:

A screenshot of a terminal window with a dark background. It shows the output of the C program. The first line is 'Sumit Verma,8725189,CSE-B' in green. The second line is 'enter three no.: 12 55 38' where 'no.:' is blue and the numbers are red. The third line is '55 is largest' where '55' is red and 'is largest' is blue.

```
Sumit Verma,8725189,CSE-B
enter three no.: 12 55 38
55 is largest
```

Program-3d

Aim : Write a program to find roots of a quadratic equation.

Program :

```
#include<stdio.h>
#include<math.h>

void main ()
{
    int a,b,c,d,x,y;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter coeff. of x^2:");
    scanf("%d",&a);
    printf("enter coeff. of x:");
    scanf("%d",&b);
    printf("enter the constant value:");
    scanf("%d",&c);
    d=b*b-4*a*c;
    if(d>=0)
    {
        x=(-b+sqrt(d))/(2*a);
        y=(-b-sqrt(d))/(2*a);
        printf("roots of quadratic equations are:%d ,%d",x,y);
    }
    else
    {
        printf("Roots are imaginary");
    }
}
```

Output:

```
Sumit Verma,8725189,CSE-B
enter coeff. of x^2: 1
enter coeff. of x: -5
enter the constant value: 6
roots of quadratic equations are: 3 , 2
```


Program-4a

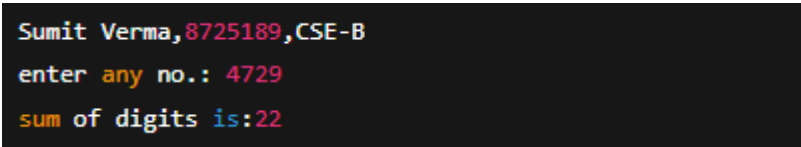
Aim : Write a program to find the sum of individual digits of a positive number.

Program :

```
#include<stdio.h>

void main ()
{
    int a,b,res=0;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter any no.:");
    scanf("%d",&a);
    while(a>0)
    {
        b=a%10;
        res=res+b;
        a=a/10;
    }
    printf("sum of digits is:%d",res);
}
```

Output:

A screenshot of a terminal window showing the output of the program. The text is displayed in a monospaced font with some color coding: 'Sumit Verma,8725189,CSE-B' in white, 'enter any no.: 4729' in yellow and red, and 'sum of digits is:22' in yellow and blue.

```
Sumit Verma,8725189,CSE-B
enter any no.: 4729
sum of digits is:22
```

Program-4b

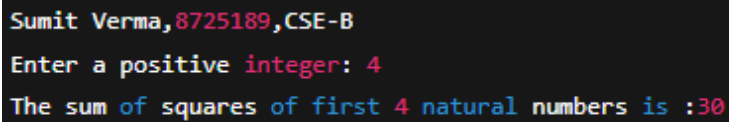
Aim : Write a program to find the sum of square of first n numbers.

Program :

```
#include <stdio.h>

int void main ()
{
    int n, sum=0, i = 1;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter a positive integer: ");
    scanf("%d", &n);
    while (i<=n)
    {
        sum += i*i;
        i++;
    }
    printf("The sum of squares of first %d natural numbers is :%d\n", n, sum);
}
```

Output:

A screenshot of a terminal window showing the output of the program. The text is as follows:
Sumit Verma,8725189,CSE-B
Enter a positive integer: 4
The sum of squares of first 4 natural numbers is :30
The text is displayed in a monospaced font with some characters in red and blue, likely due to terminal coloring or a specific font style.

```
Sumit Verma,8725189,CSE-B
Enter a positive integer: 4
The sum of squares of first 4 natural numbers is :30
```

Program-4c

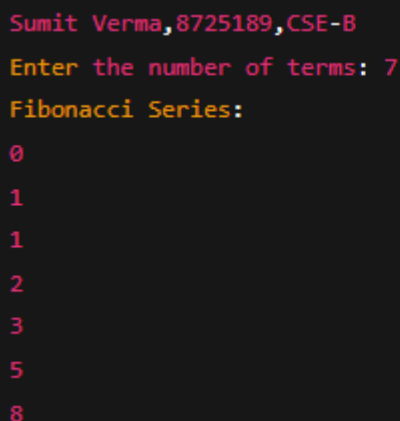
Aim : Write a program to generate the first n terms of Fibonacci series.

Program :

```
#include <stdio.h>

void main ()
{
    int n;
    unsigned long long int first = 0, second = 1, next;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter the number of terms: ");
    scanf("%d", &n);
    printf("Fibonacci Series:\n");
    for (int i = 0; i < n; i++) {
        if (i <= 1) {
            next = i;
        }
        else{
            next = first + second;
            first = second;
            second = next;
        }
        printf("%llu\n", next);
    }
}
```

Output:

A screenshot of a terminal window with a dark background. The output of the program is displayed in a monospaced font. The first line is 'Sumit Verma,8725189,CSE-B' in red. The second line is 'Enter the number of terms: 7' in yellow. The third line is 'Fibonacci Series:' in yellow. The following lines are the Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, all in red.

```
Sumit Verma,8725189,CSE-B
Enter the number of terms: 7
Fibonacci Series:
0
1
1
2
3
5
8
```


Program-4d

Aim : Write a program to check whether a number is a palindrome or not.

Program :

```
#include<stdio.h>

void main ()
{
    int a,b=0,c,d;
    printf("enter any no.:");
    scanf("%d",&a);
    d=a;
    while(a>0)
    {
        c=a%10;
        b=b*10+c;
        a=a/10;
    }
    if(d!=b)
    {
        printf("it is not a palindrome");
    }
    else
    {
        printf("it is a palindrome");
    }
}
```

Output:

```
Sumit Verma,8725189,CSE-B
enter any no.: 1221
it is a palindrome
```

```
Sumit Verma,8725189,CSE-B
enter any no.: 123
it is not a palindrome
```

Program-4e

Aim : Write a program to generate a pascal's triangle.

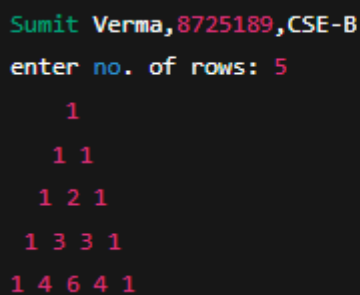
Program :

```
#include<stdio.h>

void main ()
{
    int ncr,rows,space,n,r;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter no. of rows:");
    scanf("%d",&rows);
    for(n=0;n<rows;n++){
        for(space=1;space<rows-n;space++){
            printf(" ");
        }
        for(r=0;r<=n;r++){
            if(n==0 || r==0){
                ncr=1;
                printf("%d ",ncr);
            }
            else{
                ncr=(ncr* (n-r+1)/r);
                printf("%d ",ncr);
            }
        }

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

Output:



```
Sumit Verma,8725189,CSE-B
enter no. of rows: 5
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

Program-4f

Aim : Write a program to find prime numbers between 1 and n ,where n is the value entered by user.

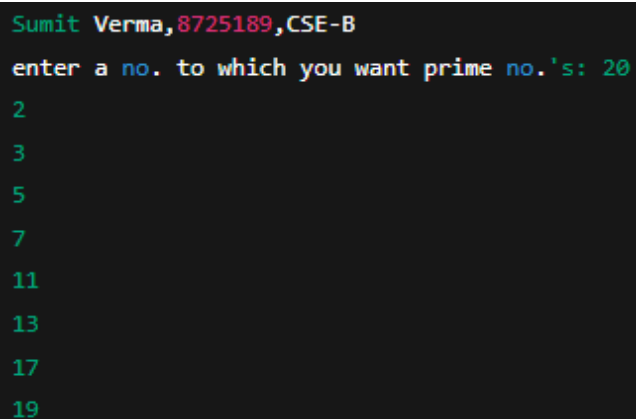
Program :

```
#include<stdio.h>

void main ()
{
    int a,c=0,i,j;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter a no. to which you want prime no.'s:");
    scanf("%d",&a);
    for(i=2;i<=a;i++)
    {
        for(j=i-1;j>1;j--)
        {
            if(i%j==0)
            {
                c=2;
                break;
            }
            else{
                c=1;
            }
        }

        if(c!=2){
            printf("%d\n",i);
        }
    }
}
```

Output:



```
Sumit Verma,8725189,CSE-B
enter a no. to which you want prime no.'s: 20
2
3
5
7
11
13
17
19
```

Program-5a

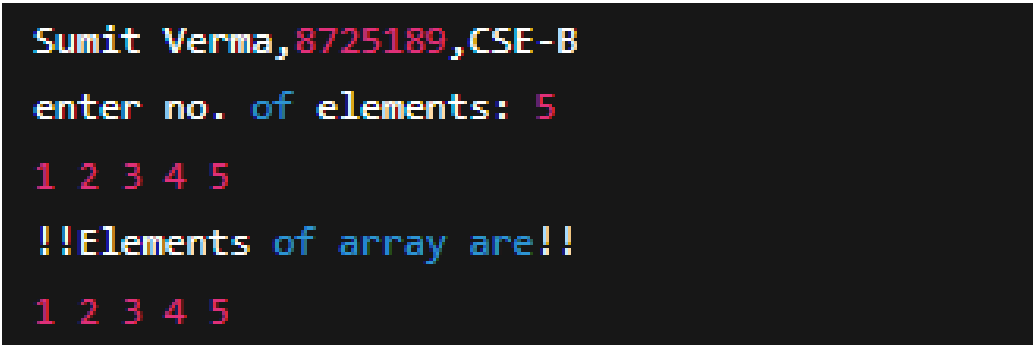
Aim: Write a program to traverse in a linear array.

Program:

```
#include<stdio.h>

void main ()
{
    int i,n;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("enter no. of elements:");
    scanf("%d",&n);
    int a[n];
    for(i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }
    printf("!!Elements of array are!!\n");
    for(i=0;i<n;i++)
    {
        printf("%d ",a[i]);
    }
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output shows the program's execution: it prints the user's name and ID, prompts for the number of elements (5), reads five integers (1 2 3 4 5), and then prints them back separated by spaces.

```
Sumit Verma,8725189,CSE-B
enter no. of elements: 5
1 2 3 4 5
!!Elements of array are!!
1 2 3 4 5
```

Program-5b

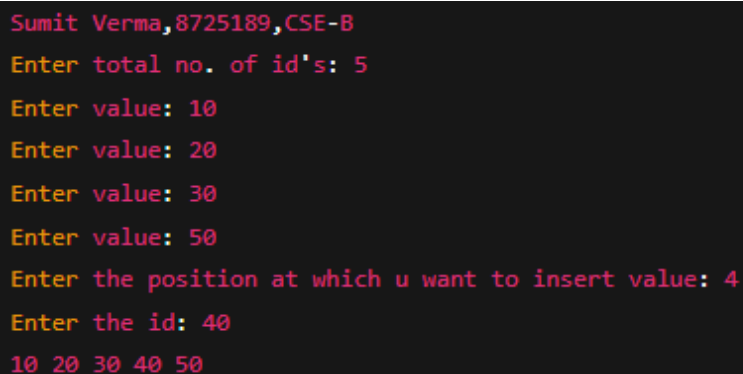
Aim: Write a program for inserting an element in a linear array.

Program:

```
#include<stdio.h>

void main (){
    int n,i,pos,nid,k,j;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter total no. of id's:");
    scanf("%d",&n);
    int a[n];
    for(i=0;i<n-1;i++){
        printf("Enter value:");
        scanf("%d",&a[i]);
    }
    printf("Enter the position at which u want to insert value:");
    scanf("%d",&pos);
    printf("Enter the id:");
    scanf("%d",&nid);
    for(j=n-1;j>=pos-1;j--){
        a[j+1]=a[j];
    }
    a[pos-1]=nid;
    for(k=0;k<n;k++){
        printf("%d ",a[k]);
    }
}
```

Output:

A screenshot of a terminal window showing the execution of the C program. The output consists of several lines of text where the first part of each line is in yellow and the rest is in red. The sequence of inputs and outputs is: 'Sumit Verma,8725189,CSE-B', 'Enter total no. of id's: 5', 'Enter value: 10', 'Enter value: 20', 'Enter value: 30', 'Enter value: 50', 'Enter the position at which u want to insert value: 4', 'Enter the id: 40', and finally the array elements '10 20 30 40 50' printed on the same line.

```
Sumit Verma,8725189,CSE-B
Enter total no. of id's: 5
Enter value: 10
Enter value: 20
Enter value: 30
Enter value: 50
Enter the position at which u want to insert value: 4
Enter the id: 40
10 20 30 40 50
```

Program-5c

Aim: Write a program for deleting an element in a linear array.

Program:

```
#include<stdio.h>

void main ()
{
    int a[20],p,i,n;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter total no. of elements in array:");
    scanf("%d",&n);
    for(i=0;i<n;i++)
    {
        printf("Enter value:");
        scanf("%d",&a[i]);
    }

    printf("Enter the position where the element has to be deleted:");
    scanf("%d",&p);
    if(p>=n+1)
    {
        printf("Deleteion not possible.");
    }
    else
    {
        for(i=p-1;i<n-1;i++)
        {
            a[i]=a[i+1];
        }
        printf("Resultant array\n");
        for(i=0;i<n-1;i++)
        {
            printf("%d ",a[i]);
        }
    }
}
```

}

Output:

```
Sumit Verma,8725189,CSE-B
Enter total no. of elements in array: 5
Enter value: 11
Enter value: 22
Enter value: 33
Enter value: 44
Enter value: 55
Enter the position where the element has to be deleted: 3
Resultant array
11 22 44 55
```

Program-6a

Aim: Write a program for addition of two matrices.

Program:

```
#include<stdio.h>

void main ()
{
    int a[3][3],b[3][3],i,j,c[3][3],v;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter the first matrix\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            printf("value of [%d][%d]",i,j);
            scanf("%d",&a[i][j]);
        }
    }
    printf("Enter the second matrix\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            printf("value of [%d][%d]",i,j);
            scanf("%d",&b[i][j]);
        }
    }
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            c[i][j]=a[i][j]+b[i][j];
        }
    }
    printf("!!Added Matrix is!!\n");
```



```

for(i=0;i<3;i++)
{
    for(j=0;j<3;j++)
    {
        printf("%d\t",c[i][j]);

    }
    printf("\n");
}
}

```

Output:

```

Sumit Verma,8725189,CSE-B
Enter the first matrix
value of [0][0] 1
value of [0][1] 2
value of [0][2] 3
value of [1][0] 4
value of [1][1] 5
value of [1][2] 6
value of [2][0] 7
value of [2][1] 8
value of [2][2] 9
Enter the second matrix
value of [0][0] 9
value of [0][1] 8
value of [0][2] 7
value of [1][0] 6
value of [1][1] 5
value of [1][2] 4
value of [2][0] 3
value of [2][1] 2
value of [2][2] 1
!!Added Matrix is!!
10 10 10
10 10 10
10 10 10

```

Program-6b

Aim: Write a program for matrix multiplication by checking compatibility.

Program:

```
#include<stdio.h>

#define N 50

void main ()
{
    int a[N][N],b[N][N],i,j,c[N][N],k,m,n,p,q;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter the value of rows and columns in 1st matrix:");
    scanf("%d %d",&n,&m);
    printf("Enter the first matrix\n");
    for(i=0;i<n;i++)
    {
        for(j=0;j<m;j++)
        {
            printf("value of [%d][%d]",i,j);
            scanf("%d",&a[i][j]);
        }
    }
    printf("Enter the value of rows and columns in 2nd matrix:");
    scanf("%d %d",&p,&q);
    printf("Enter the second matrix\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            printf("value of [%d][%d]",i,j);
            scanf("%d",&b[i][j]);
        }
    }

    if(m!=p)
```

```

{
    printf("Sorry! Cannot Multiply");

}
else
{
    for(i=0;i<n;i++)
    {
        for(j=0;j<q;j++)
        {
            c[i][j]=0;
            for(k=0;k<=n;k++)
            {
                c[i][j]=c[i][j]+a[i][k]*b[k][j];
            }
        }
    }
}

printf("Resultant Matrix\n");
for(i=0;i<n;i++)
{
    for(j=0;j<q;j++)
    {
        printf("%d\t",c[i][j]);
    }
    printf("\n");
}
}

```

Output:

```
Sumit Verma,8725189,CSE-B
Enter the value of rows and columns in 1st matrix: 2 3
Enter the first matrix
value of [0][0] 1
value of [0][1] 2
value of [0][2] 3
value of [1][0] 4
value of [1][1] 5
value of [1][2] 6
Enter the value of rows and columns in 2nd matrix: 3 2
Enter the second matrix
value of [0][0] 7
value of [0][1] 8
value of [1][0] 9
value of [1][1] 10
value of [2][0] 11
value of [2][1] 12
Resultant Matrix
58 64
139 154
```

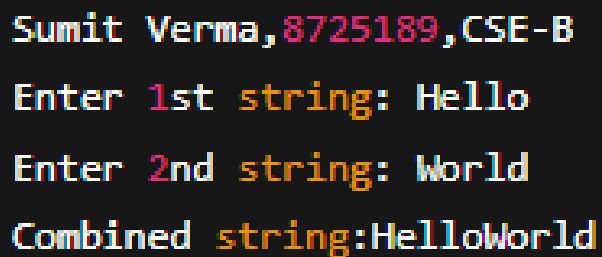
Program-7a

Aim: Write a program to concatenate two strings.

Program:

```
#include<stdio.h>
#include<string.h>
void main ()
{
    char a[100],b[100];
    int i,j;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter 1st string:");
    gets(a);
    printf("Enter 2nd string:");
    gets(b);
    j=strlen(a);
    for(i=0;b[i]!='\0';i++)
    {
        a[i+j]=b[i];
    }
    a[i+j]='\0';
    printf("Combined string:%s",a);
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output shows the program's execution: it prints the author's name and ID, prompts for two strings, and then prints the concatenated result. The text is: Sumit Verma,8725189,CSE-B, Enter 1st string: Hello, Enter 2nd string: World, Combined string:HelloWorld.

```
Sumit Verma,8725189,CSE-B
Enter 1st string: Hello
Enter 2nd string: World
Combined string:HelloWorld
```

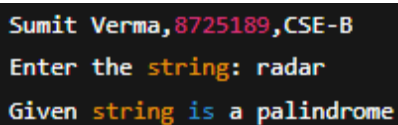
Program-7b

Aim: Write a program to check whether a string is palindrome or not.

Program:

```
#include<stdio.h>
#include<string.h>
void main (){
    char a[100],b[100],temp;
    int l,lin,rin,i;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter the string:");
    scanf("%s",a);
    strcpy(b,a);
    l=strlen(a);
    lin=0;
    rin=l-1;
    for(i=lin;i<rin;i++){
        temp=a[i];
        a[i]=a[rin];
        a[rin]=temp;
        rin--;
    }
    if(strcmp(a,b)==0){
        printf("Given string is a palindrome");
    }
    else {
        printf("Given string is not a palindrome");
    }
}
```

Output:

A screenshot of a terminal window showing the output of the program. The first line is 'Sumit Verma,8725189,CSE-B' in red. The second line is 'Enter the string: radar' in yellow. The third line is 'Given string is a palindrome' in yellow.

```
Sumit Verma,8725189,CSE-B
Enter the string: radar
Given string is a palindrome
```

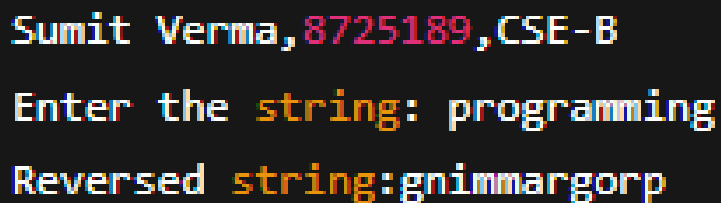
Program-7c

Aim: Write a program to reverse a string.

Program:

```
#include<stdio.h>
#include<string.h>
void main ()
{
    char a[100],temp;
    int l,lin,rin,i;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter the string:");
    scanf("%s",a);
    l=strlen(a);
    lin=0;
    rin=l-1;
    for(i=lin;i<rin;i++)
    {
        temp=a[i];
        a[i]=a[rin];
        a[rin]=temp;
        rin--;
    }
    printf("Reversed string:%s",a);
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output shows three lines: 'Sumit Verma,8725189,CSE-B' (where '8725189' is red), 'Enter the string: programming' (where 'string:' is orange), and 'Reversed string:gnimmargorp' (where 'string:' is orange).

```
Sumit Verma,8725189,CSE-B
Enter the string: programming
Reversed string:gnimmargorp
```

Program-8

Aim: Write a program to demonstrate the concept of simple functions.

Program:

```
#include<stdio.h>

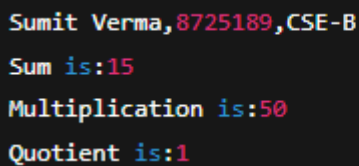
int add(int,int);
int mul(int,int);
int quo(int,int);
void main (){
    int x,y,z;
    printf("Sumit Verma,8725189,CSE-B\n");
    x=add(10,5);
    y=mul(10,5);
    z=quo(10,6);
    printf("Sum is:%d\nMultiplication is:%d\nQuotient is:%d",x,y,z);
}

int add(int a,int b){
    int sum=0;
    sum=a+b;
    return(sum);
}

int mul(int a,int b){
    int mul=1;
    mul=a*b;
    return(mul);
}

int quo(int a,int b){
    int quo;
    quo=a/b;
    return(quo);
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output shows the program's execution results: the user's name and ID, followed by the results of the add, multiplication, and division functions. The text is: Sumit Verma,8725189,CSE-B, Sum is:15, Multiplication is:50, Quotient is:1.

```
Sumit Verma,8725189,CSE-B
Sum is:15
Multiplication is:50
Quotient is:1
```


Program-9

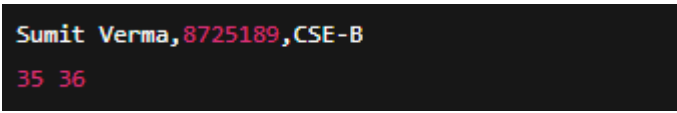
Aim: Write a program to solve numerical method problems (prefix and postfix operations).

Program:

```
#include<stdio.h>

void main ()
{
    int a=20,b=35;
    printf("Sumit Verma,8725189,CSE-B\n");
    a=b++;
    printf("%d %d\n",a,b);
}
```

Output:

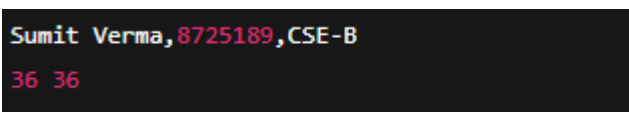
A screenshot of a terminal window with a black background. The first line of output is "Sumit Verma,8725189,CSE-B" in white text. The second line of output is "35 36" in red text.

```
Sumit Verma,8725189,CSE-B
35 36
```

```
#include<stdio.h>

void main ()
{
    int a=20,b=35;
    printf("Sumit Verma,8725189,CSE-B\n");
    a=++b;
    printf("%d %d\n",a,b);
}
```

Output:

A screenshot of a terminal window with a black background. The first line of output is "Sumit Verma,8725189,CSE-B" in white text. The second line of output is "36 36" in red text.

```
Sumit Verma,8725189,CSE-B
36 36
```

```
#include<stdio.h>

void main ()
{
    int a=20,b=35;
    printf("Sumit Verma,8725189,CSE-B\n");
    a=b--;
    printf("%d %d\n",a,b);
}
```

Output:

```
Sumit Verma,8725189,CSE-B
35 34
```

```
#include<stdio.h>
```

```
void main ()
```

```
{
```

```
    int a=20,b=35;
```

```
    printf("Sumit Verma,8725189,CSE-B\n");
```

```
    a--b;
```

```
    printf("%d %d\n",a,b);
```

```
}
```

Output:

```
Sumit Verma,8725189,CSE-B
34 34
```

Program-10a

Aim: Write a program to find factorial using recursion.

Program:

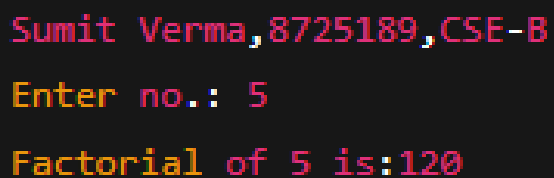
```
#include<stdio.h>

int facto(int);

void main ()
{
    int a,b;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter no.:");
    scanf("%d",&a);
    b=facto(a);
    printf("Factorial of %d is:%d",a,b);
}

int facto(int x)
{
    int fact;
    if(x==1)
    {
        return 1;
    }
    else
    {
        fact=x*facto(x-1);
        return fact;
    }
}
```

Output:

A screenshot of a terminal window with a black background. It shows the output of the program: 'Sumit Verma,8725189,CSE-B' in red, 'Enter no.: 5' in yellow, and 'Factorial of 5 is:120' in yellow.

```
Sumit Verma,8725189,CSE-B
Enter no.: 5
Factorial of 5 is:120
```

Program-10b

Aim: Write a program to generate Fibonacci series upto n terms using recursion.

Program:

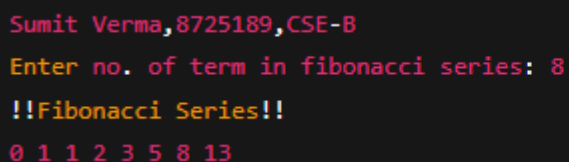
```
#include<stdio.h>

int fib(int);

void main ()
{
    int i,n,res;
    printf("Sumit Verma,8725189,CSE-B\n");
    printf("Enter no. of term in fibonacci series:");
    scanf("%d",&n);
    printf("!!Fibonacci Series!!\n");
    for(i=0;i<n;i++){
        res=fib(i);
        printf("%d ",res);
    }
}

int fib(int n){
    if(n==0){
        return 0;
    }
    else if(n==1){
        return 1;
    }
    else{
        return fib(n-1)+fib(n-2);
    }
}
```

Output:

A screenshot of a terminal window with a dark background. The output text is as follows:

```
Sumit Verma,8725189,CSE-B
Enter no. of term in fibonacci series: 8
!!Fibonacci Series!!
0 1 1 2 3 5 8 13
```

Program-11

Aim: Write a program to print elements of a structure using pointers.

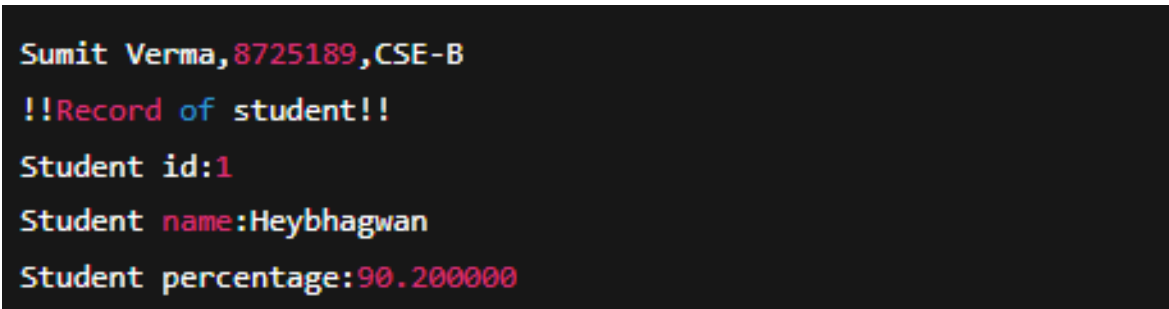
Program:

```
#include<stdio.h>

struct student
{
    int id;
    char name[30];
    float percentage;
};

void main ()
{
    struct student record={1,"Sumit ",90.2};
    struct student *ptr;
    printf("Sumit ,8725189,CSE-B\n");
    ptr=&record;
    printf("!!Record of student!!\n");
    printf("Student id:%d\n",ptr->id);
    printf("Student name:%s\n",ptr->name);
    printf("Student percentage:%f",ptr->percentage);
}
```

Output:

A screenshot of a terminal window with a black background and white text. The output of the program is displayed line by line: 'Sumit Verma,8725189,CSE-B', '!!Record of student!!', 'Student id:1', 'Student name:Heybhagwan', and 'Student percentage:90.200000'.

```
Sumit Verma,8725189,CSE-B
!!Record of student!!
Student id:1
Student name:Heybhagwan
Student percentage:90.200000
```