Program1:-
Without Pointer:

```
#include<stdio.h>
//the program might seem extremely drawn out but it is highly versatile
float power(float,float);

main()
{
 float a,b;  //used to store the values given by user
 float res;  //used to store the result
 printf("Enter the values of a and b\n");
 scanf("%f%f",&a,&b);

 if(b==0)
 {
  int b1 = b;  //used to store the float b in int format
  printf("%.2f raised to the power %d is 1",a,b1);
 }

 else
 {
  res = power(a,b); //calling the function
  printf("%.2f raised to the power %.2f is = %f",a,b,res);
 }
}

float power(float n1, float n2)
{
 //this function is the main mechanism of the program
 int c;  //counter variable
 float r = 1.000000; //used to store and return the result
 if(n2<0)
 {//this block executes if given value of b is negative
  c = -1;
  n1 = 1/n1;
  while(c>=n2)
  {
   r = r*n1;
   c--;
  }
 }
 else
 {//this block executes if given value of b is positive
  c = 1;
  while(c<=n2)
  {
   r = r*n1;
   c++;
  }
 }

 return(r); //returns the result
```

```
}
```

With Pointer:

```
#include<stdio.h>
//the program might seem extremely drawn out but it is highly versatile
void power(float *,float *, float *);

main()
{
 float a,b;  //used to store the values given by user
 float res;  //used to store the result
 printf("Enter the values of a and b\n");
 scanf("%f%f",&a,&b);

 if(b==0)
 {
  int b1 = b;  //used to store the float b in int format
  printf("%.2f raised to the power %d is 1",a,b1);
 }

 else
 {
  power(&a,&b,&res); //calling the function
  printf("%.2f raised to the power %.2f is = %f",a,b,res);
 }
}

void power(float *n1, float *n2, float *res)
{
 //this function is the main mechanism of the program
 int c;  //counter variable
 float r = 1.000000; //used to store and return the result
 if(*n2<0)
 {//this block executes if given value of b is negative
  c = -1;
  *n1 = 1/(*n1);
  while(c>=*n2)
  {
   r = r*(*n1);
   c--;
  }
 }
 else
 {//this block executes if given value of b is positive
  c = 1;
  while(c<=*n2)
  {
   r = r*(*n1);
   c++;
  }
 }
```

```
 *res = r;
}
```

Program2:-
Without Pointer:

```
#include<stdio.h>

float area_circle(int);

main()
{//this block is used to take the input and give final output
 int r; //used to store the radius of the circle
 float area; //used to store the area of the circle
 printf("Enter the radius of the circle\n");
 scanf("%d",&r);

 if(r<0)
 {
  printf("Radius cannot be Negative");
 }
 else
 {
 area = area_circle(r); //function call
 printf("The area of the circle is = %.3f",area);
 }
}

float area_circle(int r1)
{//this block is used for claculating the area of the circle
 float ar;
 ar = 3.14 * r1 * r1;
 return(ar);
}
```

With Pointer:

```
#include<stdio.h>

void area_circle(int *, float *);

main()
{//this block is used to take the input and give final output
 int r; //used to store the radius of the circle
 float area; //used to store the area of the circle
 printf("Enter the radius of the circle\n");
 scanf("%d",&r);

 if(r<0)
 {
  printf("Radius cannot be Negative");
 }
 else
 {
```

```
 area_circle(&r,&area); //function call
 printf("The area of the circle is = %.3f",area);
 }
}

void area_circle(int *r1, float *ar)
{//this block is used for claculating the area of the circle
 float ar1;
 ar1 = 3.14 * (*r1) * (*r1);
 *ar = ar1;
}
```

Program3:-

Without Pointer:

```
#include<stdio.h>

void check(char);

main()
{
 char c;
 printf("Enter the Letter\n");
 scanf("%c",&c);

 check(c);
}

void check(char ch)
{
 int a = ch;
 if(((a>=65)&&(a<=90) || (a>=97)&&(a<=122)))
 {
  if((ch=='a') ||  (ch=='e') ||  (ch=='i') ||  (ch=='o') ||  (ch=='u') ||  (ch=='A') ||  (ch=='E') ||  (ch=='I') ||  (ch=='O') ||  (ch==
'U'))
  {
   printf("'%c' is a Vowel",ch);
  }
  else
  {
   printf("'%c' is a Consonant",ch);
  }
 }
 else
 {
  printf("'%c' is not a letter",ch);
 }
}
```

With Pointer:

```
#include<stdio.h>

void check(char *);
```

```
main()
{
 char c;
 printf("Enter the Letter\n");
 scanf("%c",&c);

 check(&c);
}

void check(char *ch)
{
 int a = *ch;
 if(((a>=65)&&(a<=90) || (a>=97)&&(a<=122)))
 {
  if((*ch=='a') ||  (*ch=='e') ||  (*ch=='i') ||  (*ch=='o') ||  (*ch=='u') ||  (*ch=='A') ||  (*ch=='I') ||  (*ch=='O') ||  (*ch=='
U'))
   {
    printf("'%c' is a Vowel",*ch);
   }
  else
   {
    printf("'%c' is a Consonant",*ch);
   }
 }
 else
 {
  printf("'%c' is not a letter",*ch);
 }
}
```

Program4:-
Without Pointer:

```
#include<stdio.h>

int checkPrime(int);

main()
{
 int n,count;

 printf("Enter the Number\n");
 scanf("%d",&n);

 count = checkPrime(n);
 if(count==2)
 {
  printf("It is a Prime number");
 }

 else
 {
  printf("It is not a Prime number");
```

```
 }

}

int checkPrime(int no)
{
 int x, count=0;
 x=1;

 while(x<=no)
 {
  if((no%x)==0)
  {
   count++;
  }
  x++;
 }
 return(count);
}
```

With Pointer:

```
#include<stdio.h>

void checkPrime(int *, int *);

main()
{
 int n,c;

 printf("Enter the Number\n");
 scanf("%d",&n);

 checkPrime(&n,&c);
 if(c==2)
 {
  printf("It is a Prime number");
 }

 else
 {
  printf("It is not a Prime number");
 }

}

void checkPrime(int *no,int *cnt)
{
 int x, count=0;
 x=1;

 while(x<=*no)
 {
```

```
  if((*no%x)==0)
  {
   count++;
  }
  x++;
 }
 *cnt = count;
}
```

Program5:-
Without Pointer:

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

float comp_Interest(float,float,float,float);

main()
{
 float a,p,r,t,n;
 printf("Enter the Principal Amount\n");
 scanf("%f",&p);
 printf("Enter the Period in Years\n");
 scanf("%f",&t);
 printf("Enter the number of times the interest is compounded per period\n");
 scanf("%f",&n);
 printf("Enter the Rate of Interest\n");
 scanf("%f",&r);

 a = comp_Interest(p,r,t,n);

 printf("The Compund Interest is = %f",a);
}

float comp_Interest(float p,float r,float t,float n)
{
 float amt;
 r = r/100;
 amt = p * pow((1+(r/n)),(n*t));
 return(amt);
}
```

With Pointer:

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

void comp_Interest(float,float,float,float,float *);

main()
{
 float a,p,r,t,n;
 printf("Enter the Principal Amount\n");
 scanf("%f",&p);
```

```
 printf("Enter the Period in Years\n");
 scanf("%f",&t);
 printf("Enter the number of times the interest is compounded per period\n");
 scanf("%f",&n);
 printf("Enter the Rate of Interest\n");
 scanf("%f",&r);

 comp_Interest(p,r,t,n,&a);

 printf("The Compund Interest is = %f",a);
}

void comp_Interest(float p,float r,float t,float n,float *a)
{
 float amt;
 r = r/100;
 amt = p * pow((1+(r/n)),(n*t));
 *a = amt;
}
```

Program6:-

Without Pointer:

```
#include<stdio.h>

int factorial(int);

main()
{
 int num,fact;

 printf("Enter the number\n");
 scanf("%d",&num);

 fact = factorial(num);
 printf("The factorial of %d is %d",num,fact);
}

int factorial(int num)
{
 int x,fact=1;

 for(x=num;x>=1;x--)
 {
  fact = fact * x;
 }

 return(fact);
}
```

With Pointer:

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

```
void factorial(int ,int *);

main()
{
 int num,fact;

 printf("Enter the number\n");
 scanf("%d",&num);

 factorial(num,&fact);
 printf("The factorial of %d is %d",num,fact);
}
void factorial(int num,int *fact)
{
 int x;
 *fact = 1;

 for(x=num;x>=1;x--)
 {
  *fact = *fact * x;
 }

}
```

Program7:-
Without Pointer:

```
#include<stdio.h>

int gcd(int,int);

main()
{
 int n1,n2,res;

 printf("Enter the numbers\n");
 scanf("%d%d",&n1,&n2);

 res = gcd(n1,n2);
 printf("The GCD of %d and %d is %d",n1,n2,res);
}

int gcd(int n1,int n2)
{//here we use a new way of finding GCD or HCF

 while(n1!=n2)
 {
  if(n1>n2)
  {
   n1 = n1-n2;
  }
  else
  {
```

```
   n2 = n2-n1;
  }

 }

 return(n2);
}
```

With Pointer:

```
#include<stdio.h>

void gcd(int ,int ,int *);

main()
{
 int n1,n2,res;

 printf("Enter the numbers\n");
 scanf("%d%d",&n1,&n2);

 gcd(n1,n2,&res);
 printf("The GCD of %d and %d is %d",n1,n2,res);
}

void gcd(int n1,int n2,int *res)
{//here we use a new way of finding GCD or HCF

 while(n1!=n2)
 {
  if(n1>n2)
  {
   n1 = n1-n2;
  }
  else
  {
   n2 = n2-n1;
  }

 }
 *res = n2;
}
```

Program8:-

Without Pointer:

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

int binary(int);

main()
{//this block only takes the input
 int no;
```

```
 printf("Enter the Number\n");
 scanf("%d",&no);
 binary(no); //calling the functin
}

int binary(int no)
{//this block converts decimal to binary
 int d;
 int sum = 0; //it stores the binary value
 int cnt = 0;

 while(no>0)
 {
  d = no%2;
  sum = sum+d*pow(10,cnt);
  no = no/2;
  cnt++;
 }
 printf("The Binary Code for %d is %d",no,sum);
}
```

With Pointer:

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

void binary(int,int *);

main()
{//this block only takes the input
 int no,bin;
 printf("Enter the Number\n");
 scanf("%d",&no);
 binary(no,&bin); //calling the function
 printf("The Binary Code for %d is %d",no,bin);
}

void binary(int no,int *bin)
{//this block converts decimal to binary
 int d;
 int sum = 0;
 int cnt = 0;

 while(no>0)
 {
  d = no%2;
  sum = sum+d*pow(10,cnt);
  no = no/2;
  cnt++;
 }
 *bin = sum;  //stores the binary number
}
```