Loop 3

1. write a program that will be print all the prime numbers between two integers entered by the user

```
#include <iostream>
using namespace std;

int main()
{
   int n,m,i,j,isprime;

   cout<<"N :";
   cin>>n;
   cout<<"M :";
   cin>>m;

// i contains number within the rang [m,n]

   for(i=n; i<=m; i++){

// chake if i prime or notprime

   isprime=1;
   for(j=2; j<i; j++){

      if(i%j==0){
         isprime=0;
         break;
      }

   }

   if(isprime==1){
      cout<<i<<" ";
   }

   }

   return 0;
}
```

2. If the user enter two numbers, print all the palindrome numbers between those two numbers

```
#include <iostream>
using namespace std;

int main()
{
  int m,n,i,r,rev,pal;


  cout<< "Enter [N]:";
  cin>>n;
  cout<< "Enter [M]:";
  cin>>m;

  cout<<"The palindnome numbers : ";

  for(i=n; i<=m; i++){

     pal=i;                    //Take a copy of i to use
     rev=0;

     while(pal!=0){            //Using the copy of i

        r= pal%10;
        rev = (rev*10)+r;      // revers the numbers
        pal =pal/10;
     }

     if(rev==i){
     cout<<rev <<" ";
     }

  }
  return 0;
}
```

3. write a program that will be print all the perfect numbers between two integers entered by the user

```
#include <iostream>
using namespace std;

int main()
{
   int n,m,i,j,sum;

   cout<<"N :";
   cin>>n;
   cout<<"M :";
   cin>>m;

   cout<<"The perfect Number is: ";

// i contains number within the rang [m,n]
   for(i=n; i<=m; i++){

// chake if it's perfect
   sum=0;
  for(j=1; j<i; j++)
   {
     if(i%j==0)
     {
       sum+=j;
     }
   }
// If the current number i is Perfect number

   if(sum==i)
   {
     cout<<i<<" ";
   }
  }

   return 0;
}
```

4. Find the sum of the squares of the first 100 odd number

```
#include <iostream>
using namespace std;

int main()
{
   int sqr, sum=0, i;

   for(i = 1; i < 200; i = i + 2){
      sqr = i * i;
      sum = sum + sqr;
   }

   cout <<"Sum of the square of first 100 odd number is: " << sum;

   return 0;
}
```

5. compute thr sum s= 1^1+2^2+3^3+.....+10^10

```
#include <iostream>
using namespace std;

int main()
{
   int i, j, sum=0, m, n, s;

   cout << "Enter N : ";
   cin>>n;
   cout<<"Enter M :";
   cin>>m;

   //Generate number
   for(i = n; i < m; i++){

      s = 1;

      //Power calculation
      //Run the loop for (i+1) times to calculate (i^i)

      for(j = 1; j <= i; j++){
         s = s * i;              //calculate i^i
      }

      sum = sum + s;                  //calculate the sum after the value of (i^i) has been generated
      cout << i <<"^"<< i << " + ";   //Display the series
   }

   //This is to avoid last '+' sign

   s = 1;
   for(j = 1; j <= i; j++){
         s = s * i;              //calculate i^i
   }
   sum = sum + s;
   cout << i <<"^"<< i ;

   cout << " = " << sum;

   return 0;
}
```

6.compute thr sum s= 1^0+2^-1+3^-2+.....+10^-9

```
#include <iostream>
using namespace std;

int main(){                                    //
float i, j, sum=0, m, n,s;
   cout << "Sum of the following series: "<< endl;

   //Generate number
   for(i = 1; i < 10; i++){
      s = 1;
      //Power calculation
      //Run the loop for i times to calculate (i^i(-1))
      //(j <= i - 1) because power is (i - 1). same as (< i)

      for(j = 1; j <= i - 1; j++){
         s = s * i;              //calculate i^i
      }
      n = 1 / s;                 //calculate i^(-i)
      sum = sum + n;             //calculate the sum after the value of (i^(-i)) has been generated

      //Display the series
      // If is to avoid printing (^-0)
      //Else print (^-(i-1))

      if (i - 1 == 0){
         cout << i <<"^"<< i - 1 << " + ";
      }
      else{
      cout << i <<"^-"<< i - 1 << " + ";    //Display the series
      }
   }
   //This is to avoid last '+' sign
   s = 1;
   for(j = 1; j <= i-1; j++){
      s = s * i;               //calculate i^i
   }
   n = 1 / s;                  //calculate i^(-i)
   sum = sum + n;              //calculate the sum after the value of (i^(-i)) has been generated
   cout << i <<"^-"<< i - 1 ;
   cout << " = " << sum;
   return 0;}
```

7.compute thr sum s= 1!+2!+3!+.....+10!

```
#include <iostream>
using namespace std;

int main()
{
   int i, j, sum=0, m, n, s;

   cout << "Enter N : ";
   cin>>n;
   cout<<"Enter M :";
   cin>>m;

// i contains number within the rang [m,n]
   for(i = n; i < m; i++){

      s = 1;

      for(j = 1; j <= i; j++){

         s = s * i;          // calclute 1!
      }

      sum = sum + s;          // calclute 1!+2!
      cout << i <<"!"<< " + ";
   }

// avoid last '+' sign
   s = 1;
   for(j = 1; j <= i; j++){
         s = s * i;
   }
   sum = sum + s;
   cout << i <<"!";


   cout << " = " << sum;

   return 0;
}
```

8. Compute the value of e^x. The user will enter the value of x and n. The value of n cannot be greater than 10. $x$can be a fraction.Use the following formula.

$$e^x = \frac{x^0}{0!} + \frac{x^1}{1!} + \frac{x^2}{2!} + \cdots + \frac{x^n}{n!}$$

```
#include <iostream>
using namespace std;

// declaring a function or function prototype

   float power (float ,int);
   int factorial (int);
   float exponential(float);

int main(){

   float x,ex;

   cout<<"Enter x:";
   cin>>x;

// declaring part

   ex = exponential(x);

   cout<<"e^"<<x<<" = "<<ex;

   return 0;
}

//defining a function
// exponential calculate
float exponential(float x){    // cin 'x' = this 'x'
   int i;
   float sum;
   sum=1;
   for(i=1; i<=5; i++){

      sum= sum+ power (x ,i)/factorial (i);
   }
   return sum;
}
// power calculate
float power (float x ,int y){     // x = x  i = y
```

```
    int i;
    float m;
    m=1;

    for(i=1; i<=y; i++){
        m=m*x;
    }
    return m;       // power
}
// factorial calculate
int factorial (int y){     // i = y

    int i,m;
    m=1;
    for(i=1; i<=y; i++){
        m=m*i;
    }
    return m;           //factorial
}
```

9.Find all the numbers between 10 and 1000 where each numbers summation of their digits is a prime number. For example 344 should be print because 3+4+4=11 which is a prime number

```
#include <iostream>
using namespace std;

// declaring a function or function prototype

   int sum_of_digits (int);
   int isprime (int);

int main(){
   int i,dsum,prime;

// step 1.chake declaring part 2.go defining function and calculat

   for(i=10; i<=1000; i++){

      dsum = sum_of_digits(i);
      prime = isprime(dsum);

      if(prime==1)
      {
        cout<<i<<" ";
      }
   }

   return 0;
}

//defining a function
// sum the digits
int sum_of_digits (int n){      // i=n

   int r,sum=0;

   while(n>0){
      r=n%10;
      sum=sum+r;
      n=n/10;

   }
   return sum;}
```

```
//chake prime or not

int isprime (int n){        //dsum=n

   int i,p;
   p=1;

   for(i=2; i<n; i++){

      if(n%i==0){
         p=0;
         break;
      }
   }
   if(n==1){
      p=0;
   }
   return p;

}
```

10.write a program that aske the user how many input take, than take the specified number of input and count the number of positive , negative , x=zero , odd and even number.

```
#include <iostream>
using namespace std;

int main()
{                                                    //
  int i,x,m,p,n,z,o,e;
  p=0;
  z=0;
  n=0;
  e=0;
  o=0;
      cout<<"Number of input : ";
      cin>>m;

  for(i=0; i<m; i=i+1){
     cout<<"Enter  a integer ["<<(i+1)<<"] = ";
     cin>>x;

     if (x>0) {
        p=p+1;        /* count positive Number */
     }
     else if(x<0){
        n=n+1;        /* count Negative Number */
     }
       else if (x==0)
      {
         z=z+1;       /* count Zero */
      }

     if(x%2==0) {
        e=e+1;        /* count Even */
     }
     else
        o=o+1;        /* count Odd */
  }
         cout<<" positive : "<<p<<endl;
        cout<<" Negative : "<<n<<endl;
        cout<<" Even : "<<e<<endl;
        cout<<" Zero : "<<z<<endl;
        cout<<" Odd : "<<o<<endl;
      return 0;}
```

11 a.

1
1 2
1 2 3

```
#include <iostream>
using namespace std;

int main () {
int n,m,c,r;

   cout<<"Enter N :";
   cin>>n;
   cout<<"Enter M :";
   cin>>m;

   for(r=n; r<=m; r++)      // r=1 r<=3 r++, 2<=3 r++, 3<=3 r++  'r ar upor nerbor kora row koita hoba'
   {
      for(c=n; c<=r; c++) // c=1 c<=1 c++, c=1 c<=2 c++, c=1 c<=3 c++
      {
         cout<< c;
      }

      cout<<endl;
   }



return 0;
}
```

11 b.

3 2 1
2 1
1

```
#include <iostream>
using namespace std;

int main () {
int n,m,i,j;

   cout<<"Enter N :";
   cin>>n;

 for(i=n; i>=1; i--)      // i=3 3>=1 , 2>=1 , 1>=1
 {
    for(j=i; j>=1; j--)  // j=3 ,2 ,1
    {
       cout<<j<<" ";
    }
    cout<<endl;
 }


return 0;
}
```

11 c.

1
1 0
1 0 1

```
#include <iostream>
using namespace std;

int main () {
int n,m,c,r;

   cout<<"Enter N :";
   cin>>n;
   cout<<"Enter M :";
   cin>>m;

   for(r=n; r<=m; r++)      // r=1 r<=3 r++, 2<=3 r++, 3<=3 r++  'r ar upor nerbor kora row koita hoba'
   {
      for(c=n; c<=r; c++) // c=1 c<=1 c++, c=1 c<=2 c++, c=1 c<=3 c++
      {
         cout<< c%2;      /*1         1%2=1 , 2%2=0 3%2=1 4%2=0
                            1 0
                            1 0 1  */
      }

      cout<<endl;
   }



return 0;
}
```