MA144: Problem Solving and Computer Programming

Lecture-10

Programs on Loops

Finding all prime numbers between 1 and a given number

Program for determining prime or not

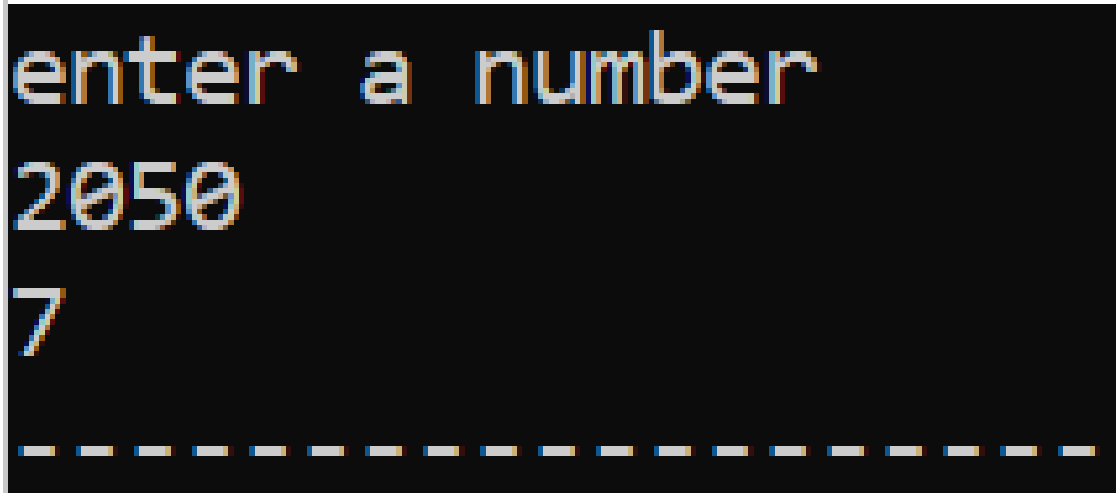
```
#include<iostream>
using namespace std;
int main()
{
int n,flag=0,i,r;
cout<<"enter a number \n";
cin>>n;
for(i=2;i<=n/2;i=i+1)
   {   r=n%i;
       if(r==0)
        { flag=1;
          break;
        }
   }
     if(flag==0)
       cout<<"prime";
     else
       cout<<"not prime";
     return 0;
}
```

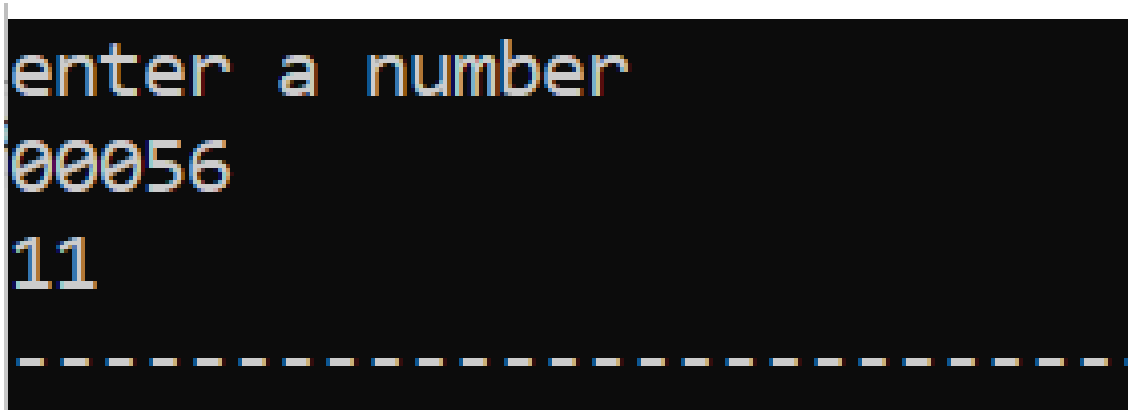
```
#include<iostream>
using namespace std;
int main()
{
int n,i,r,k,count=0;
cout<<"enter a number \n";
cin>>n;
int flag;
for(k=2;k<=n;k=k+1)
{ flag=0;
 for(i=2;i<=k/2;i=i+1)
  {  r=k%i;
     if(r==0)
      { flag=1;
        break;
      }
  }
  if(flag==0)
      {
        cout<<k<<" ";
        count=count+1;
      }
}
cout<<endl<<count;
return 0;
}
```

Finding the sum of digits of a given number

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

int main()
{
int n,d,sum=0;
cout<<"enter a number\n";
cin>>n;
while(n!=0)
{
d=n%10;
n=n/10;
sum=sum+d;
}
cout<<sum;
return 0;
}
```


enter a number
2050
7


enter a number
00056
11

Finding a number with the digits of a given number in reverse order

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

int main()
{
int n,d,sum=0;
cout<<"enter a number\n";
cin>>n;
while(n!=0)
{
d=n%10;
n=n/10;
sum=sum*10+d;
}
cout<<sum;
return 0;
}
```

```
enter a number
1234
4321
--------------------
```

```
enter a number
2022
2202
--------------------
```

```
enter a number
200
2
--------------------
```

```
enter a number
00234
432
--------------------
```

Check whether the given number is perfect or not.

A **perfect number** is a positive integer that is equal to the sum of its divisors excluding the number itself.

Example. 1+2+3=6, 28, 496, 8128

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

int main()
{
int n,i,sum=0;
cout<<"enter a number\n";
cin>>n;
for(i=1;i<=n/2;i++)
{
    if(n%i==0)
        sum=sum+i;
}

if(sum==n)
    cout<<n<<" is perfect";
else  cout<<n<<" is NOT perfect";
return 0;
}
```

Finding Fibonacci sequence.

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

int main()
{
int n,i=1,pre=1,cur=1,next;
cout<<"enter a number\n";
cin>>n;
cout<<"Fibonacci sequence is \n";
cout<<pre<<" "<<cur<<" ";
while(i<=n-2)
  {
     i=i+1;
     next=pre+cur;
     cout<<next<<" ";
     pre=cur;
     cur=next;
  }
return 0;
}
```

```
enter a number
10
Fibonacci sequence is
1 1 2 3 5 8 13 21 34 55
--------------------------------
```

Finding maximum of given n numbers.

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

int main()
{
int n,i,a,max;
cout<<"enter total numbers ";
cin>>n;
cout<<"enter 1 st number\n";
cin>>a;
max=a;
for(i=2;i<=n;i++)
{  cout<<"enter "<<i<<" th"<< " number\n";
   cin>>a;
   if(a>max)
      max=a;
}
cout<<" maximum number is "<<max;
return 0;
}
```

```
enter total numbers 5
enter 1 st number
0
enter 2 th number
-23
enter 3 th number
-2
enter 4 th number
-45
enter 5 th number
-8
 maximum number is 0
--------------------------------
```