**Problem 1**

Write a program that takes four integers a, b, c, m as input. And outputs the result as (𝑎 ∗ 𝑏 ∗ 𝑐) % 𝑚. Here, a, b, c & m all fits in 32-bit integer.

**Code 1**

|  |
| --- |
| #include<bits/stdc++.h>  using namespace std;  typedef long long ll;  int main(){  ll a,b,c,m;  cout<<"Enter A B C & M:"<<endl;  cin>>a>>b>>c>>m;  cout<<"\n (A\*B\*C) % M : ";  cout<<((a%m)\*(b%m)\*(c%m))%m<<endl;  return 0;  } |

**Problem 2**

Write a program that takes 3 integers (𝑏, 𝑛, 𝑚) as input and gives a single output computing the value 𝑏 𝑛 𝑚𝑜𝑑 𝑚.

**Code 2**

|  |
| --- |
| #include<bits/stdc++.h>  using namespace std;  typedef long long ll;  int main(){  ll a,b,x,n,m;  vector<int>v;  cout<<"Enter B N & M:"<<endl;  cin>>b>>n>>m;  a=n;  while(a){  v.push\_back(a%2);  a/=2;  }  a=b%m;  x=1;  for(int i=0;i<v.size();i++){  if(v[i]){  x=(x\*a)%m;  }  a=(a\*a)%m;  }    cout<<"\n (B^N) % M : ";  cout<<x<<endl;  return 0;  } |

**Problem 3**

Take a number n as input. Print all the prime numbers less than or equal to n. Here, n > 0.

**Code 3**

|  |
| --- |
| #include<bits/stdc++.h>  using namespace std;  typedef long long ll;  bool p[1000003];  void seive(ll n){  for(ll i=0;i<n+1;i++){  p[i]=true;  }  for(ll i=2;i\*i<=n;i++){  if(p[i]){  for(ll j=i\*i;j<=n;j+=i){  p[j]=false;  }  }  }  for(ll i=2;i<=n;i++){  if(p[i]){  cout<<" "<<i;  }  }  cout<<endl;  }  int main(){  ll a,b,c,n;  cout<<" Enter N: ";  cin>>n;  cout<<"\n The Prime Numbers till N are: "<<endl;  seive(n);  return 0;  } |

**Problem 4**

Take two numbers m & n as input. Here n can be as large as 1000 digits long. Print the result 𝑛 𝑚𝑜𝑑 𝑚 as output of the program.

**Code 4**

|  |
| --- |
| #include<bits/stdc++.h>  using namespace std;  typedef long long ll;  int main(){  ll a,x,x1,x2,p,i,j,b,c,m;  map<char,int>mp;  string n;  mp['0']=0;  mp['1']=1;  mp['2']=2;  mp['2']=3;  mp['4']=4;  mp['5']=5;  mp['6']=6;  mp['7']=7;  mp['8']=8;  mp['9']=9;  cout<<"Enter N & M:"<<endl;  cin>>n;  cin>>m;  x=0;  for(i=0;i<n.size();i++){  vector<int>v;  c=n.size()-i-1;  while(c){  v.push\_back(c%2);  c/=2;  }  x1=1;  p=10%m;  for(j=0;j<v.size();j++){  if(v[j]){  x1=(x1\*p)%m;  }  p=(p\*p)%m;  }  x2=((mp[n[i]]%m)\*x1)%m;  x= (x+x2)%m;  }  cout<<"\n N % M : ";  cout<<x<<endl;  return 0;  } |

***# End #***