**Code 1**

#include<bits/stdc++.h>

using namespace std;

int main(){

int n,i,j,inc\_max=0,dec\_max=0;

cout<<"Enter the Value of N: ";

cin>>n;

int arr[n+5];

vector<int>inc[n+5],dec[n+5];

cout<<"Enter N Integers: ";

for(i=0;i<n;i++){

cin>>arr[i];

}

for(i=0;i<n;i++){

inc[i].push\_back(arr[i]);

dec[i].push\_back(arr[i]);

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

if(arr[j]>inc[i].back()){

inc[i].push\_back(arr[j]);

}

if(arr[j]<dec[i].back()){

dec[i].push\_back(arr[j]);

}

}

if(inc[i].size()>inc[inc\_max].size()){

inc\_max=i;

}

if(dec[i].size()>dec[dec\_max].size()){

dec\_max=i;

}

}

cout<<"\nMax Increasing Subsequence: ";

for(i=0;i<inc[inc\_max].size();i++){

cout<<inc[inc\_max][i]<<" ";

}

cout<<"\nMax Decreasing Subsequence: ";

for(i=0;i<dec[dec\_max].size();i++){

cout<<dec[dec\_max][i]<<" ";

}

cout<<endl;

return 0;

}

**Code 2**

#include<bits/stdc++.h>

using namespace std;

typedef long long ll;

#define Max 1000000007

ll po(ll a,ll n){

ll rs=1;

while(n){

if(n%2){

rs=(rs\*a)%Max;

}

n=n/2;

a=(a\*a)%Max;

}

return rs;

}

ll fact(int n){

if(n==0){

return 1;

}

else{

return ((n%Max)\*fact(n-1))%Max;

}

}

void per(int n,int r){

cout<<"\nThe Permutation of "<<n<<" and "<<r<<" is: "<<((fact(n)%Max)\*(po(fact(n-r),Max-2)%Max))%Max<<endl;

}

void com(int n,int r){

cout<<"\nThe Combination of "<<n<<" and "<<r<<" is: "<<((fact(n)%Max)\*(po(fact(r)\*fact(n-r),Max-2)%Max))%Max<<endl;

}

int main(){

int n,r;

cout<<"Enter the Value of N and R: ";

cin>>n>>r;

if(r>n){

cout<<"Invalid Input"<<endl;

}

else{

per(n,r);

com(n,r);

}

return 0;

}

**Code 3**

#include<bits/stdc++.h>

using namespace std;

typedef long long ll;

#define Max 1000000007

ll po(ll a,ll n){

ll rs=1;

while(n){

if(n%2){

rs=(rs\*a)%Max;

}

n=n/2;

a=(a\*a)%Max;

}

return rs;

}

ll fact(int n){

if(n==0){

return 1;

}

else{

return ((n%Max)\*fact(n-1))%Max;

}

}

ll com(int n,int r){

return ((fact(n)%Max)\*(po(fact(r)\*fact(n-r),Max-2)%Max))%Max;

}

int main(){

int n,i;

cout<<"Enter the Value of N: ";

cin>>n;

cout<<"(x+y)^"<<n<<"= ";

cout<<"("<<"x^"<<n<<")";

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

cout<<" + ("<<com(n,i)<<"(x^"<<n-i<<")(y^"<<i<<"))";

}

cout<<" + ("<<"(y^"<<n<<"))"<<endl;

return 0;

}

**## End ##**