Problem 02: Given a positive integer n and a non-negative integer not exceeding n, find the number of r-permutations and r-combinations of a set with n elements.

Solution:
Source code:

```
#include<bits/stdc++.h>
using namespace std;

unsigned long long fact(unsigned long long num)
{
        if(num==1 || num==0)
        {
             return 1;
        }
        else
        {
            return num * fact(num-1);
        }
}

int main()
{
   unsigned long long n,r,p,c;

   cout<<"Enter n,r respectively: ";
   cin>>n>>r;

   p = fact(n)/fact(n-r);
   c = fact(n)/(fact(r)*fact(n-r));

   cout<<"The r-permutation is = "<<p<<endl;
   cout<<"The r-combination is = "<<c<<endl;

   return 0;

}
```

Problem 03: Given a positive integer n. Expand the series (x+y)n.

Solution:
Source code:

```
#include<bits/stdc++.h>
using namespace std;
```

```
long long fact(long long num)
{
        if(num==1 || num==0)
       {
            return 1;
       }
       else
       {
           return num * fact(num-1);
       }
}

long long co(long long n,long long r)
{
    long long p = fact(n);
    long long q = fact(r);
    long long s = fact(n-r);
   return p/(q*s);
}

int main()
{
   long long n,result=0;
   cout<<"Enter n: ";
   cin>>n;
   for (long long i=0;i<=n;i++)
   {
      result = co(n,i);
      if(i==0)
         cout<<"x^"<<n-i;
      else if(i==n)
         cout<<"y^"<<i;
      else
         cout<<result<<"x^"<<n-i<<"y^"<<i;
      if(i != n)
         cout<<"+";
   }
   return 0;
}
```