**BINOMIAL CO-EFFICIENT:**

There are 3 ways to find the binomial co-efficient. 1)Using Brute force technique. 2)Using Recursion technique 3)Using Dynamic Programming.

1. **Brute Force Technique:**

If the input is to find the **k**th co-efficient of the power **n**. Then the result is stored in the 2D array of size **n\*k**.

And the algorithm to find that 2D array when **n** and **k** are given is as follows:

Algorithm:

for i<-0 to n do

for j<-0 to I do

if(j==0||((i==j)&&(i<k)))

table[i][j]=1

else

table[i][j]=table[i-1][j-1]+table[i-1][j]

1. **Recursion Technique:**

It is efficient than the usual Brute force technique. And the algorithm for the recursion technique is as follows:

Algorithm:

binomial\_co-efficient(n,k)

if (k==0||n==k)

return 1

else

return binomial\_co-efficient(n-1, k-1)+binomial\_co-efficient(n-1,k)

1. **Using Dynamic Program:**

It is the most efficient technique to find the binomial co-efficient. And the algorithm for the Dynamic program to find binomial co-efficient is as follows:

It uses 1D array for storing the result. very less space consuming and very efficient.

Algorithm:

Declare the array of size k+1;

initialise the first element to 1

for i<-1 to n do

for i<-min(i,k) to 0

c[j]=c[j]+c[j-1]

return c[k]

The DP is the most efficient and the less space consuming technique to calculate the **kth** coefficient of the binomial equation of the power **n**.