

7. Write a Program to find the binomial co-efficient $C(n, k)$, [where n and k are integers and $n > k$] using brute force based algorithm and also dynamic programming based algorithm

```
def factorial(n):
    fact=1
    for i in range(2,n+1):
        fact*=i
    return fact

def binomialcoeff_bruteforce(n,k):
    return factorial(n)/(factorial(k)*factorial(n-k))

def binomialcoeff_DP(n,k):
    C=[[0 for j in range(k+1)]for i in range(n+1)]
    for i in range(n+1):
        for j in range(min(i,k)+1):
            if j==0 or j==i:
                C[i][j]=1
            else:
                C[i][j]=C[i-1][j-1]+C[i-1][j]
    return C[n][k]
n=int(input("Enter the value of n: "))
k=int(input("Enter the value of k:"))
result_bruteforce=binomialcoeff_bruteforce(n,k)
result_DP=binomialcoeff_DP(n,k)
print(f"Binomial Coefficient using Brute Force: {result_bruteforce}")
print(f"Binomial Coefficient using Dynamic Programming: {result_DP}")
```

Output 1

```
Enter the value of n: 10
Enter the value of k:2
Binomial Coefficient using Brute Force: 45
Binomial Coefficient using Dynamic Programming: 45
```

Output 2

```
Enter the value of n: 5
Enter the value of k:2
Binomial Coefficient using Brute Force: 10
Binomial Coefficient using Dynamic Programming: 10
```