1. **Binomial coefficient using dynamic programming**

**Code:**

#include <stdio.h>

// Function to calculate binomial coefficient C(n, k)

unsigned long long binomialCoeff(int n, int k)

{

unsigned long long C[n + 1][k + 1];

int i, j;

// Calculate value of binomial coefficient in bottom-up manner

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

for (j = 0; j <= k && j <= i; j++) {

// Base Cases

if (j == 0 || j == i)

C[i][j] = 1;

// Calculate value using previously stored values

else

C[i][j] = C[i - 1][j - 1] + C[i - 1][j];

}

}

return C[n][k];

}

int main()

{

int n, k;

printf("Enter the value of n: ");

scanf("%d", &n);

printf("Enter the value of k: ");

scanf("%d", &k);

if (k > n) {

printf("Invalid input: k must be less than or equal to n.\n");

return 1;

}

printf("Binomial coefficient C(%d, %d) is %llu\n", n, k, binomialCoeff(n, k));

return 0;

}

**Output:**

Enter the value of n: 15

Enter the value of k: 3

Binomial coefficient C(15, 3) is 455

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Process exited after 4.905 seconds with return value 0

Press any key to continue . . .

