**package** AlgorithmDpPractise;

**class** CoinChangeUsingDp

{

**public int**[] **coins**;

**public int amount**;

**public int**[][] **solutions**;

**public** CoinChangeUsingDp(**int**[] coins, **int** amount) {

**this**.**coins** = coins;

**this**.**amount** = amount;

**this**.**solutions** = **new int**[coins.**length** + 1][amount + 1];

}

**public void** NumberOfWaysPrint()

{

**for** (**int** i = 0; i <=**coins**.**length** ; i++)

{

**solutions**[i][0] = 1;

}

**for** (**int** j = 0; j <= **amount** ; j++)

{

**solutions**[0][j] = 0;

}

**for** (**int** i = 1; i <=**coins**.**length** ; i++)

{

**for** (**int** j = 1; j <=**amount** ; j++)

{

**if** (**coins**[i - 1] <= j)

{

**solutions**[i][j] = **solutions**[i - 1][j] + **solutions**[i][j-**coins**[i-1]];

}

**else**

{

**solutions**[i][j] = **solutions**[i-1][j];

}

}

}

System.***out***.println(**"The tabulation form output is :"**);

System.***out***.println(**"------------------------------------------"**);

**for** (**int** i = 0; i <=**coins**.**length** ; i++)

{

**for** (**int** j = 0; j <=**amount** ; j++)

{

System.***out***.print(**solutions**[i][j]+**" "**);

}

System.***out***.println();

}

System.***out***.println(**"------------------------------------------"**);

System.***out***.println(**"Number of ways of coin change = "**+**solutions**[**coins**.**length**][**amount**]);

}

}

**public class** CoinChangeNumberOfWays {

**public static void** main(String[] args) {

**int**[] coins = {1,2,3};

**int** amount = 4;

CoinChangeUsingDp coinChange = **new** CoinChangeUsingDp(coins,amount);

coinChange.NumberOfWaysPrint();

}

}