The Coin Change Problem

Given an amount and the denominations of coins available, determine how many ways change can be made for amount. There is a limitless supply of each coin type.

Example
$n = 3$
$c = [8, 3, 1, 2]$

There are 3 ways to make change for $n = 3$: $\{1, 1, 1\}$, $\{1, 2\}$, and $\{3\}$.

Function Description

Complete the *getWays* function in the editor below.

getWays has the following parameter(s):

- *int n:* the amount to make change for
- *int c[m]:* the available coin denominations

Returns

- *int:* the number of ways to make change

Input Format

The first line contains two space-separated integers n and m, where:
n is the amount to change
m is the number of coin types
The second line contains m space-separated integers that describe the values of each coin type.

Constraints

- $1 \leq c[i] \leq 50$
- $1 \leq n \leq 250$
- $1 \leq m \leq 50$
- Each $c[i]$ is guaranteed to be distinct.

Hints

Solve overlapping subproblems using Dynamic Programming (DP):
You can solve this problem recursively but will not pass all the test cases without optimizing to eliminate the overlapping subproblems. Think of a way to store and reference previously computed solutions to avoid solving the same subproblem multiple times. * Consider the degenerate cases:
- How many ways can you make change for 0 cents? - How many ways can you make change for > 0

cents if you have no coins? * If you're having trouble defining your solutions store, then think about it in terms of the base case $(n = 0)$. - The answer may be larger than a 32-bit integer.

Sample Input 0

```
4 3
1 2 3
```

Sample Output 0

```
4
```

Explanation 0

There are four ways to make change for $n = 4$ using coins with values given by $C = [1, 2, 3]$:

1. $\{1, 1, 1, 1\}$
2. $\{1, 1, 2\}$
3. $\{2, 2\}$
4. $\{1, 3\}$

Sample Input 1

```
10 4
2 5 3 6
```

Sample Output 1

```
5
```

Explanation 1

There are five ways to make change for $n = 10$ units using coins with values given by $C = [2, 5, 3, 6]$:

1. $\{2, 2, 2, 2, 2\}$
2. $\{2, 2, 3, 3\}$
3. $\{2, 2, 6\}$
4. $\{2, 3, 5\}$
5. $\{5, 5\}$