172. **You are given the number of sides on a die (num_sides), the number of dice to throw (num_dice), and a target sum (target). Develop a program that utilizes dynamic programming to solve the Dice Throw Problem.**

Test Cases:

1.Simple Case:

- •Number of sides: 6
- •Number of dice: 2
- •Target sum: 7

2.More Complex Case:

- •Number of sides: 4
- •Number of dice: 3
- •Target sum: 10

Output

Test Case 1:

Number of ways to reach sum 7: 6

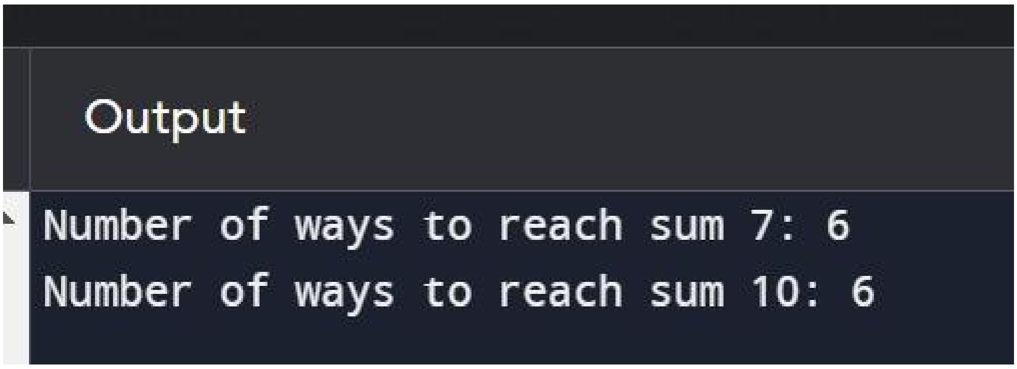
Test Case 2:

Number of ways to reach sum 10: 27

Program:
```
def count_ways_to_sum(num_dice, num_sides, target):
  dp = [[0] * (target + 1) for _ in range(num_dice + 1)]
  dp[0][0] = 1

  for i in range(1, num_dice + 1):
    for j in range(1, num_sides + 1):
      for k in range(j, target + 1):
        dp[i][k] += dp[i - 1][k - j]

  return dp[num_dice][target]

# Test Case 1
num_sides_1 = 6
num_dice_1 = 2
target_sum_1 = 7
ways_to_sum_1 = count_ways_to_sum(num_dice_1, num_sides_1, target_sum_1)
print(f"Number of ways to reach sum {target_sum_1}: {ways_to_sum_1}")

# Test Case 2
```

```
num_sides_2 = 4

num_dice_2 = 3

target_sum_2 = 10

ways_to_sum_2 = count_ways_to_sum(num_dice_2, num_sides_2, target_sum_2)

print(f"Number of ways to reach sum {target_sum_2}: {ways_to_sum_2}")
```

Output:



```
Number of ways to reach sum 7: 6
Number of ways to reach sum 10: 6
```

Timecomplexity: O(num_dice * target * num_sides)