**Dynamic Programming**

**Problem**: Find the minimum number of coins needed to make change.

I implemented the problem with two versions as,

* Recursive method
* Dynamic programming method

The following results were obtained as,

**Recursive Method:**

Input:

Money: 40

Denominations: [50, 25, 20, 10, 5, 1]

Output:

Minimum number of Coins: 2

Change: [20, 20]

Time elapsed = 0.231931209564 seconds

**Dynamic Programming Method:**

Input:

Money: 40

Denominations: [50, 25, 20, 10, 5, 1]

Output:

Minimum number of coins: 2

2 20 cents

Time elapsed = 0.000165939331055 seconds

For larger inputs as 76, 766 with denominations 1, 5, 6,

**Recursive Method:**

Input:

Money: 76 and 766

Denominations: [1, 5, 6]

Output:

*(This program does not terminate in my system with inputs 76 and 766 even after running for an hour.)*

**Dynamic Programming Method:**

Input:

Money: 76

Denominations: [1, 5, 6]

Output:

Minimum number of coins: 13

2 5 cents

11 6 cents

Time elapsed: 0.000236988067627 seconds

Input:

Money: 766

Denominations: [1, 5, 6]

Output

Minimum number of coins: 128

2 5 cents

126 6 cents

Time elapsed: 0.0017261505127 seconds

System in which the above codes were tested:

Processor: Intel Core™ i7-5500U CPU @ 2.40GHz × 4

RAM: 7.7 GiB