3. What is the edit distance between **bread** and **really** if it is allowed to insert and delete symbols, but forbidden to replace symbols?

1 / 1 point

- (•) 5
- ( ) 4
- ( ) 6

✓ **Correct**

Remove **b**, remove **d**, insert **l, l** and **y.**

4. (*This is an advanced problem*)

1 / 1 point

We want to compute not only the edit distance d between two words, but also the number of ways to edit the first word to get the second word using the minimum number d of edits. Two ways are considered different if there is such $i, 1 \leq i \leq d$ that on the i-th step the edits in these ways are different.

To solve this problem, in addition to computing array T with edit distances between prefixes of the first and second word, we compute array $ways$, such that $ways[i, j]$ = *the number of ways to edit the prefix of length* i *of the first word to get the prefix of length* j *of the second word using the minimum possible number of edits.*

Which is the correct way to compute $ways[i, j]$ based on the previously computed values?

(•)

```
1  ways[i, j] = 0
2  if T[i, j] == T[i - 1, j] + 1:
3    ways[i, j] += ways[i - 1, j]
4  if T[i, j] == T[i, j - 1] + 1:
```

Change Money

TOTAL POINTS 4

1. What is the smallest amount of money for which greedy strategy fails with coin denominations of 1, 8 and 20? **1 / 1 point**

24

Correct

The optimal solution is $24 = 8 + 8 + 8$, but the greedy algorithm will suggest $24 = 20 + 1 + 1 + 1 + 1$. For all the numbers less than 24, the greedy algorithm gives correct result.

2. What is the minimum number of coins needed to change 32 into coins with denominations 1, 8, 20? **1 / 1 point**

- 6
- 3
- 5
- 4 (selected)

Correct

ey

3. What is the running time of the dynamic programming algorithm to change m using n different coin denominations? **1 / 1 point**

- (●) $O(nm)$
- ( ) $O(n+m)$
- ( ) $O(m \log n)$

✓ **Correct**

For each value up to m, we need to try to start changing it with each of n coin denominations, thus the running time is $O(nm)$. See the lectures for more details.

4. Is it possible to change 997 using coins with denominations 2, 4 and 8? **1 / 1 point**

- (●) No
- ( ) Yes

✓ **Correct**

Proof by contradiction. If it was possible to change 997 using only coins of denominations 2, 4 and 8, it would mean that 2 divides 997, because 2 divides 2, 4 and 8. However, 2 does not divide 997, which is a contradiction.

Edit Distance

TOTAL POINTS 4

1. How many insertions are needed to make **axybc** from **abc?** **1 / 1 point**

- ○ 3
- ◉ 2
- ○ 1

✓ **Correct**
Insert **x** between **a** and **b**, then **y** between **x** and **b**.

2. What is the edit distance between words **bread** and **really**? **1 / 1 point**

- ◉ 4
- ○ 6
- ○ 3

✓ **Correct**