Change Money

4/4 points (100%)

Practice Quiz, 4 questions

1 / 1 points

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

24

Correct Response
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.

1 / 1 points

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

- 4

Correct
$32 = 8 + 8 + 8 + 8$

- 3
- 5
- 6

1 / 1 points

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Practice Quiz, 4 questions

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3.

What is the running time of the dynamic programming algorithm to change m using n different coin denominations?

- [x] $O(nm)$

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.

- [ ] $O(n+m)$
- [ ] $O(m \log n)$

1 / 1 points

4.

Is it possible to change 997 using coins with denominations 2, 4 and 8?

- [x] No

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.

- [ ] Yes