

CS2223 D Term 2020 Quiz 11

(1 point) Question 1: “My brain is open...”

I pledge that I am taking this quiz on my own, with help from no one else and no notes:

(3 points) Question 2: Dynamic Programming is an algorithmic technique that often...

- a.) ...involves recurrence relations.
- b.) ...uses solutions to smaller subproblems to solve larger problems.
- c.) ...can turn an exponential search space into a polynomial one.
- d.) All of the Above
- e.) a) and b)

(3 points) Question 3: The solution ($F(8)$) to the Coin-Row Problem below is: ...

Index	0	1	2	3	4	5	6	7	8
Coin		10	9	7	11	8	2	4	5
$F(n)$									

- a.) $10 + 11 + 2 + 5 = 28$
- b.) $10 + 7 + 8 + 5 = 30$
- c.) $10 + 7 + 8 + 4 + 5 = 34$
- d.) $10 + 9 + 11 + 8 = 38$
- e.) None of the Above

(3 points) Question 4: The nation of Odd Primordia has odd currency indeed. Their paper bills come in denominations of 3 Ducats (Ð), 5 Ducats, and 11 Ducats. Consider the chart below with the minimum number of bills needed to make change for amounts from 3Ð to 20Ð , with ∞ indicating an impossible amount.

The final entry indicating that it takes 4 bills to make 20 Ducats arises from:

Ð	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	0	∞	∞	1	∞	1	2	∞	2	3	2	1	4	3	2	3	2	3	4	3	4

- a.) Adding a 3-Ducat bill to the two 3Ð bills and the 11Ð bill needed to form 17 Ducats.
- b.) Adding a 5-Ducat bill to the three 5Ð bills needed to form 15 Ducats.
- c.) Adding an 11-Ducat bill to the three 3Ð bills needed to form 9 Ducats.
- d.) Any of the Above
- e.) None of the Above

(1 point) Bonus Question: The need for Dynamic Programming solutions in the change making problem above seldom arises in the real world because...

- a.) ...we usually mix coins and bills in making change.
- b.) ...nobody uses cash money anymore.
- c.) ...nations (and the Eurozone) use denominations that make it unnecessary.
- d.) ...a greedy algorithm—using largest bill/coin possible each at iteration—works with less effort.
- e.) d) because of c).