EXERCISE

7.1 In each of these graphs, what is the weight of the shortest path from start to finish?

**A.**

$= 8$

B.

$= 60$

C.

$= 3$
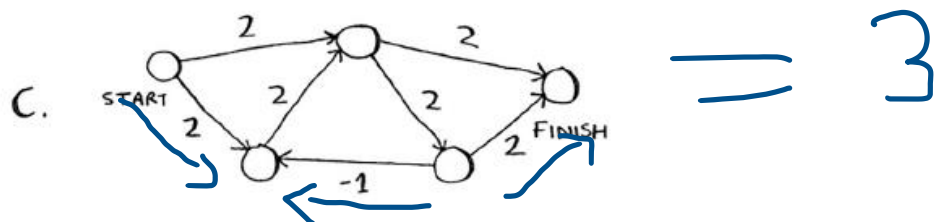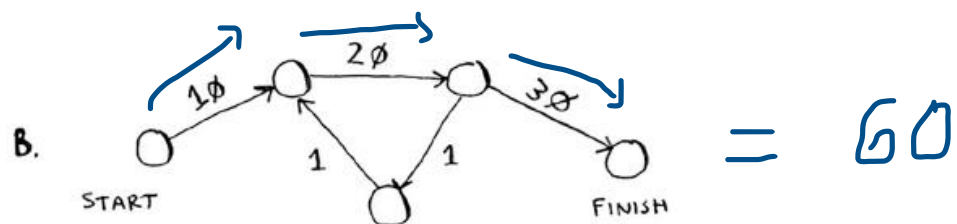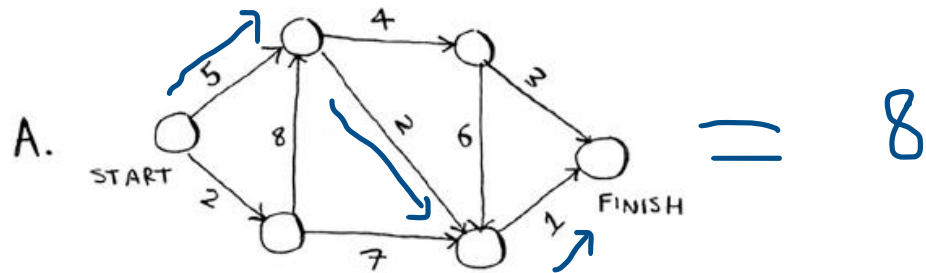
For each of these algorithms, say whether it's a greedy algorithm or not.

8.3 Quicksort   No

8.4 Breadth-first search   Yes

8.5 Dijkstra's algorithm   Yes

8.6 A postman needs to deliver to 20 homes. He needs to find the shortest route that goes to all 20 homes. Is this an NP-complete problem?

Yes

8.7 Finding the largest clique in a set of people (a *clique* is a set of people who all know each other). Is this an NP-complete problem?

Yes

8.8 You're making a map of the USA, and you need to color adjacent states with different colors. You have to find the minimum number of colors you need so that no two adjacent states are the same color. Is this an NP-complete problem?

Yes

9.1 Suppose you can steal another item: an MP3 player. It weighs 1 lb and is worth $1,000. Should you steal it?

Yes

9.2 Suppose you're going camping. You have a knapsack that will hold 6 lb, and you can take the following items. Each has a value, and the higher the value, the more important the item is:
• Water, 3 lb, 10
• Book, 1 lb, 3
• Food, 2 lb, 9
• Jacket, 2 lb, 5
• Camera, 1 lb, 6
What's the optimal set of items to take on your camping trip?

items	1	2	3	4	5	6
Book	$3	$3	$3	$3	$3	$3
Camera	$6	$9	$9	$12	$15	$15
Food	$6	$9	$10	$15	$18	$19
Jacket	$6	$9	$10	$15	$18	$19
water	$6	$9	$10	$15	$18	$25

9.3 Draw and fill in the grid to calculate the longest common substring between *blue* and *clues*.

	C	L	U	E	S
B	0	0	0	0	0
L	0	1	0	0	0
U	0	0	2	0	0
E	0	0	0	3	0