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Section 10.6

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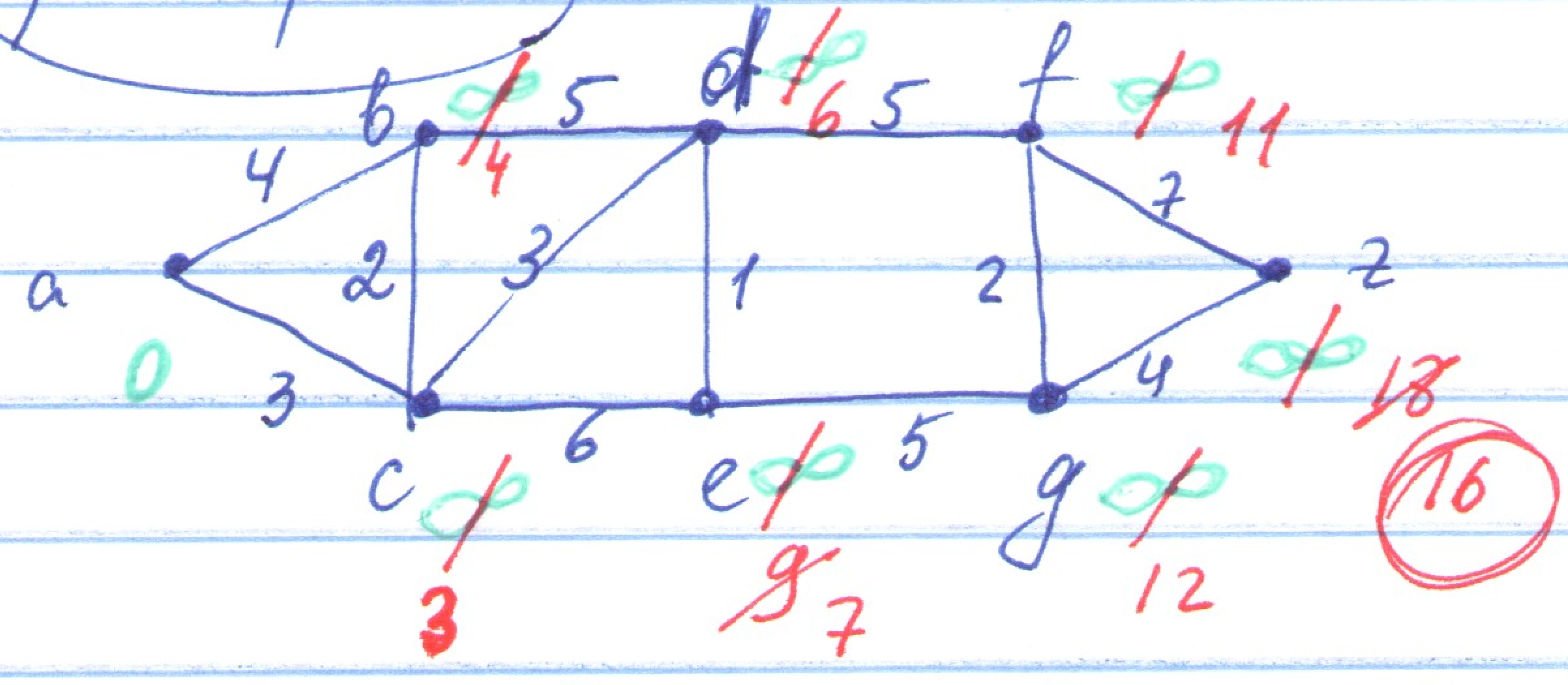
used Dijkstra's algorithm



from a to z (shortest path) length

$S = \{a, c, b, d, e, f, g, z\}$.

Answer: the length of the shortest path is 16

(the shortest path: $a \xrightarrow{3} c \xrightarrow{3} d \xrightarrow{1} e \xrightarrow{5} g \xrightarrow{4} z$)

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here I am using results of application of Dijkstra's algorithm.

a) a to d : 6 (a, c, d)

b) a to f : 11 (a, c, d, f)

c) c to f : 11 − 3 = 8 ($\cancel{a}$, c, d, f)

d) b to z : ~~16 − 4~~ ← I cannot use it because shortest path from a to z did not include b!

just by looking at the graph (shortest path):

$b \to d \to e \to g \to z$

$5 + 1 + 5 + 4 = 15$

or

$b \to c \to d \to e \to g \to z$

$2 + 3 + 1 + 5 + 4 = 15$

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Section 10.6

p. 716/1 Subway system

a least amount of time to travel between two stops

vertices: stops (stations)
edges: between adjacent (consecutive) stops
weight of an edge: travel time between two adjacent stops

b min. distance to reach a stop from another stop.

vertices: stops (stations)
edges: between adjacent (consecutive) stops
weight of an edge: distance between two adjacent stops

c the least fare ....

vertices: – " –
edges: – " –
weight of an edge: fare to travel between two adjacent stops

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Section 10.6

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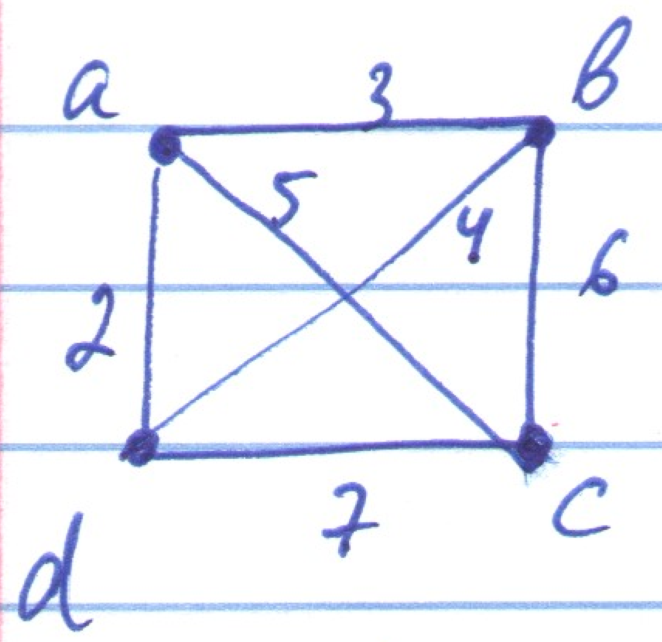
find the weights of all Hamilton circuits
determine the one with min. weight



since this is a complete graph with 4 vertices, there are $4! = 24$ of possible Hamilton circuits.

$24/2 = 12$ ← reduced the number to 12 because the direction is not of importance

- we are too lazy to do it, hence we will be looking for the min one only! (although we can do further reductions)

a, d, b, c, a
$2 + 4 + 6 + 5 = 17$

b, a, d, c, b
$3 + 2 + 7 + 6 = 18$

b, d, a, c, b
$4 + 2 + 5 + 6 = 17$

min. weight

min weight

the other ones give similar results, hence

the books answer: a, c, b, d, a