CS135

Section 10.5

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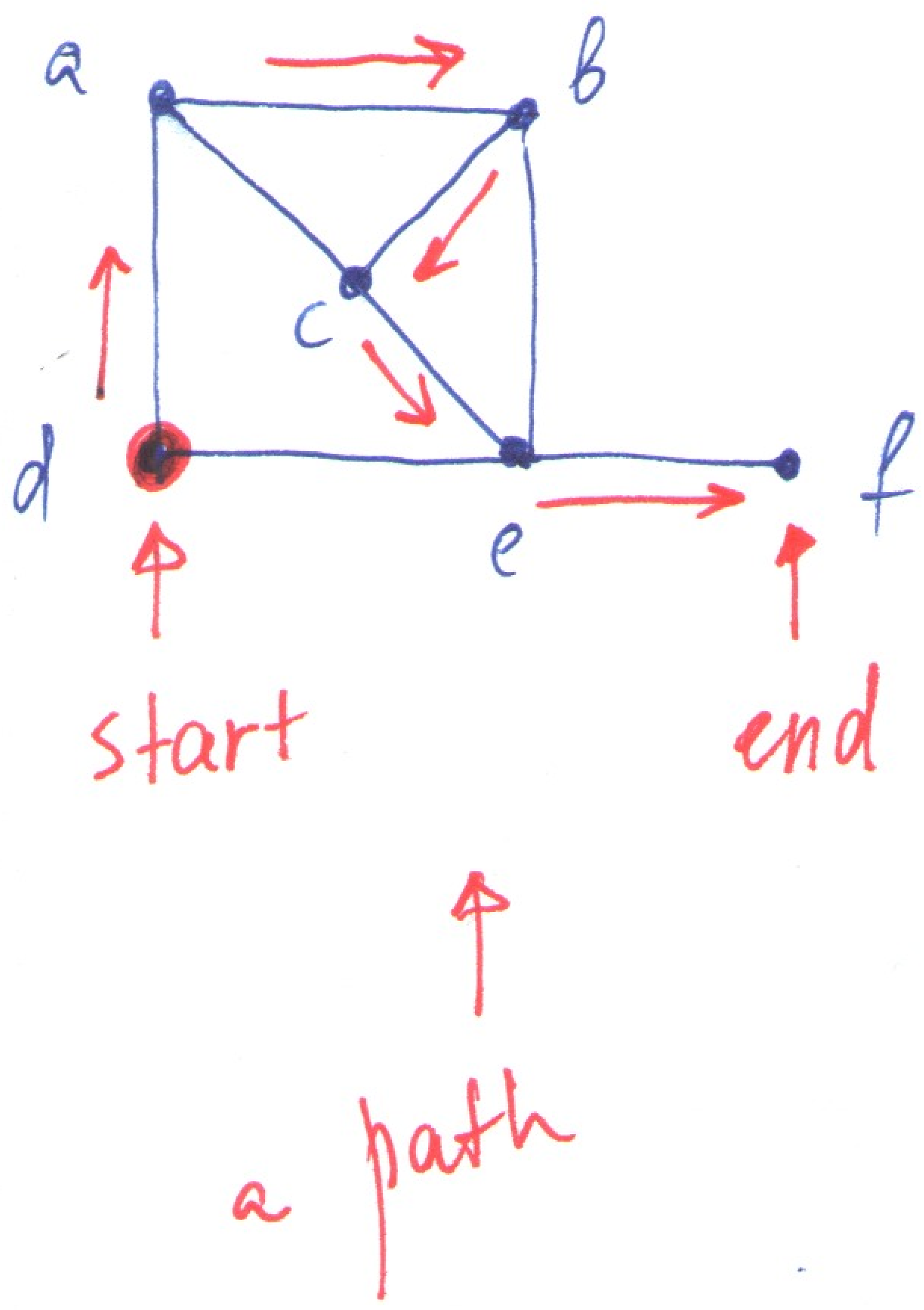

the given graph has a Hamilton ~~paths~~ ;
but doesn't have a Hamilton circuit
(because $deg(f) = 1$, so we can either arrive to f, or leave f) ~~but~~

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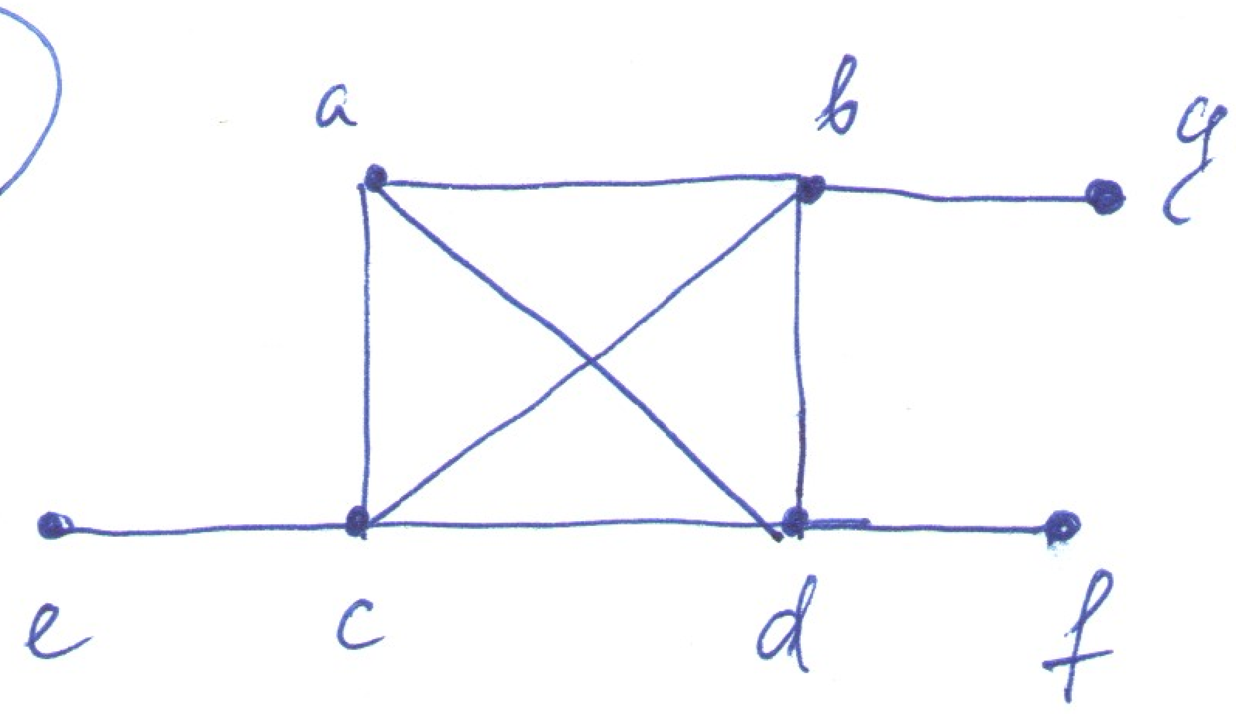

this graph doesn't have a Hamilton circuit either, with the same reason:

$deg(e) = deg(g) = deg(f)$.

so these vertices cannot be "visited" (i.e. come and leave)

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it doesn't have Hamilton path either, because three vertices have degree 1.
(two vertices with degree 1 could be ok, one - starting, and the other - finishing)

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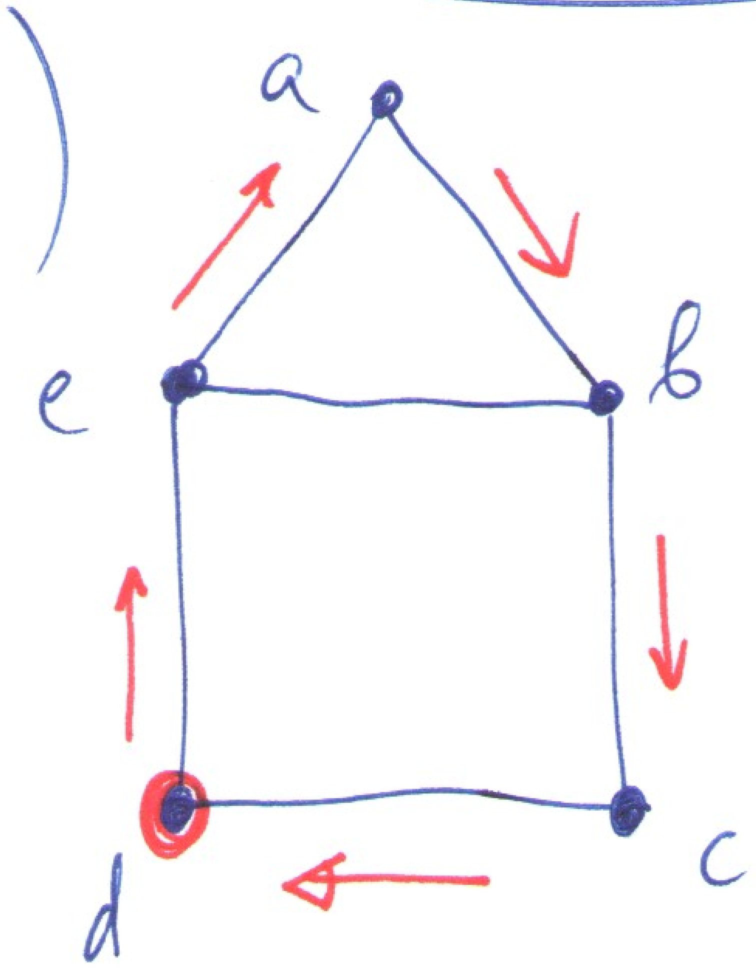
p. 706 / 47 (a,d)

a)



(i) Dirac's theorem:

simple graph: ✓

$n = 5 \geq 3$ ✓

$\deg(a) = \deg(d) = \deg(c) = 2 \geq \frac{5}{2}$ No

~~deg~~ ∴ this theorem cannot be used.

(ii) Ore's theorem:

simple graph: ✓

$n = 5 \geq 3$: ✓

$\deg(a) + \deg(d) = 2 + 2 = 4 \geq 5$ No

this theorem cannot be used.

(iii) does it have Hamilton circuit? Yes

see red arrows above.

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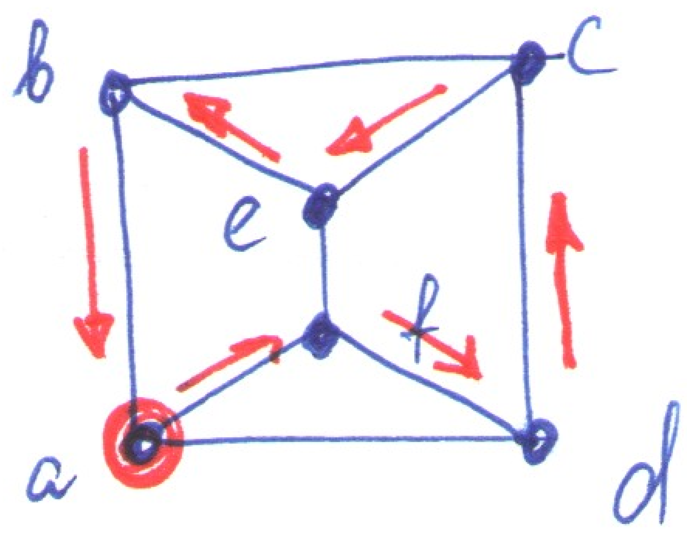
p. 706/47 (d)

d)



(i) Dirac's theorem:

simple graph: ✓

$n = 6 \geq 3$: ✓

$\deg(\text{each vertex}) = 3 \geq \frac{6}{2}$ Yes

Therefore, it has a Hamiton circuit

(this theorem can be used) see the red arrows

(ii) Ore's theorem:

$\deg(v_1) + \deg(v_2) = 3+3 = 6 \geq 6$ Yes

for any pair of vertices v_1 v_2, $v_1 \neq v_2$.

Therefore, it has a Hamilton circuit

(the theorem can be used)

(iii) yes it does