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Inspiring Excellence

CSE221

quiz 4

Date:.....

1. ~~a~~ ~~b~~

b, e → 2 ✓

a, c → 3 ✓

e, f → 3 ✓

b, c → 4 ✓

g, f → 4 ✓

a, b → 5 ✗

c, d → 5 ✓

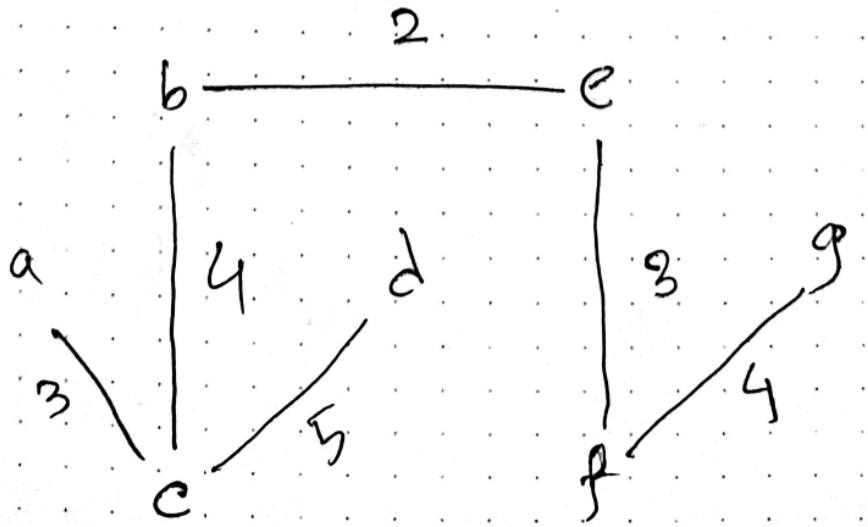
e, g → 5 ✗

b, d → 6 ✗

c, f → 6 ✗

d, f → 6 ✗

d, e → 6 ✗



Date:.....

~~{a}~~ ~~{b}~~ {c} {d} ~~{e}~~ ~~{f}~~ {g}

~~{b, e}~~

{a, c} {b, e, f}

{a, b, c, e, f}

{a, b, c, e, f, g}

{a, b, c, d, e, f, g}

Minimum Total cost

$= 3 + 4 + 5 + 2 + 3 + 4$

$= 21$

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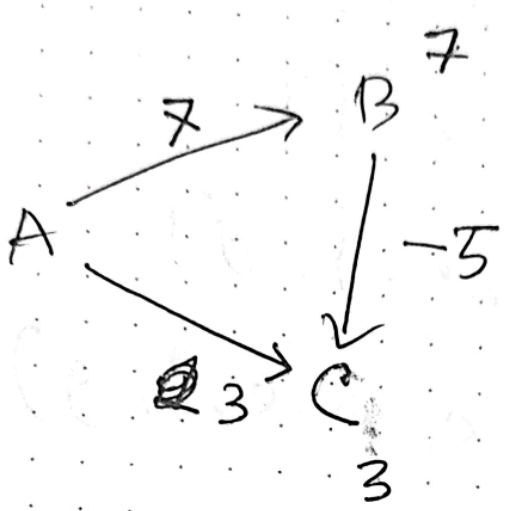
2.(a) Dijkstra.

No. Does not always work.



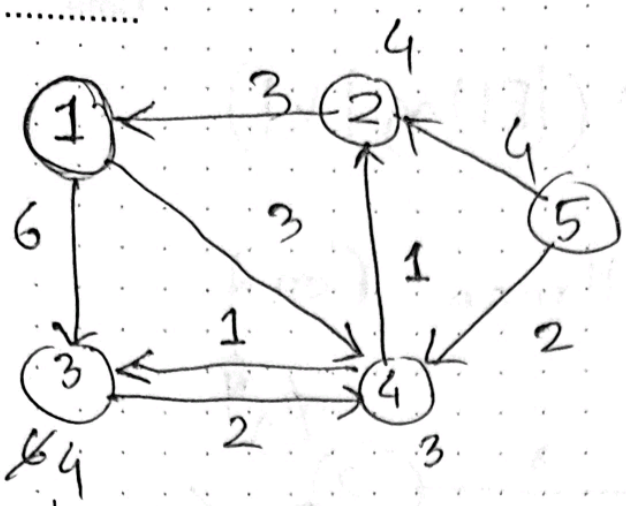
But the minimum distance of C should be 2 and shortest path should be

$A \rightarrow B \rightarrow C$.

So, dijkstra does not work in this case.

Date:.....

(b)



Min heap

node	1	2	3	4	5
dis:	0	~~∞~~ 4	~~∞~~ ~~4~~	~~∞~~ 3	~~∞~~

node	parent	dis
1	∅	0
3	~~X~~4	~~6~~4
4	1	3
2	4	~~4~~
5	∅	∞

1 → 3, 4

4 → 2, 3

2 → ∅

3 → ∅

5 → ∅

shortest path for each node:

1 → 4 → 2 # 4

1 → 4 → 3 # 4

1 → 4 # 3

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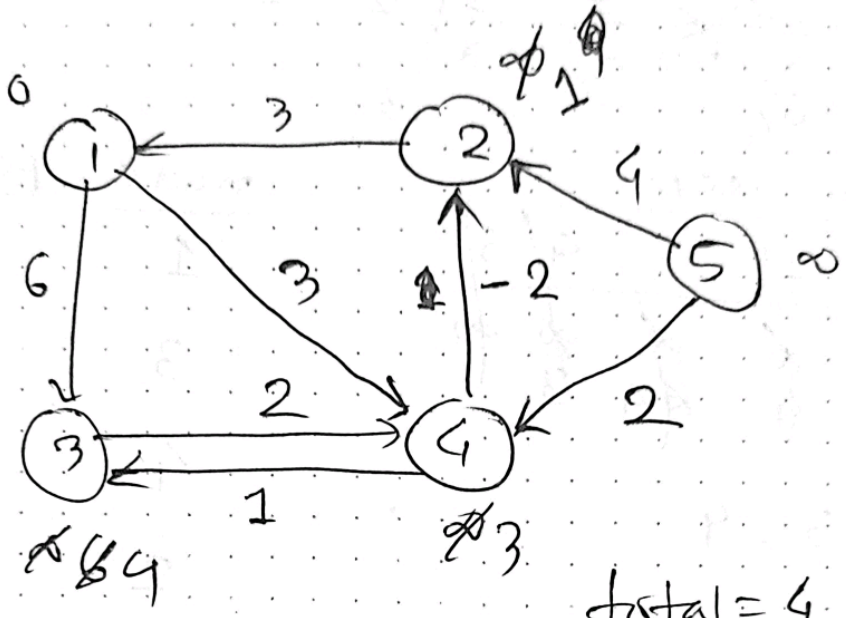
(c) $O(|E| \log |V|)$

(d) Bellman Ford.



total = 4 times

1 - 4 ✓ ✓
1 - 3 ✓ ✓
2 - 1 ✓ ✓
3 - 4 ✓ ✓
4 - 3 ✓ ✓
4 - 2 ✓ ✓
5 - 2 ✓ ✓
5 - 4 ✓ ✓

1 → 4 → 3 # 4

1 → 4 → 2 # 1

1 → 4 # 3