

3/11/22

# DMGT - Tutorial 7

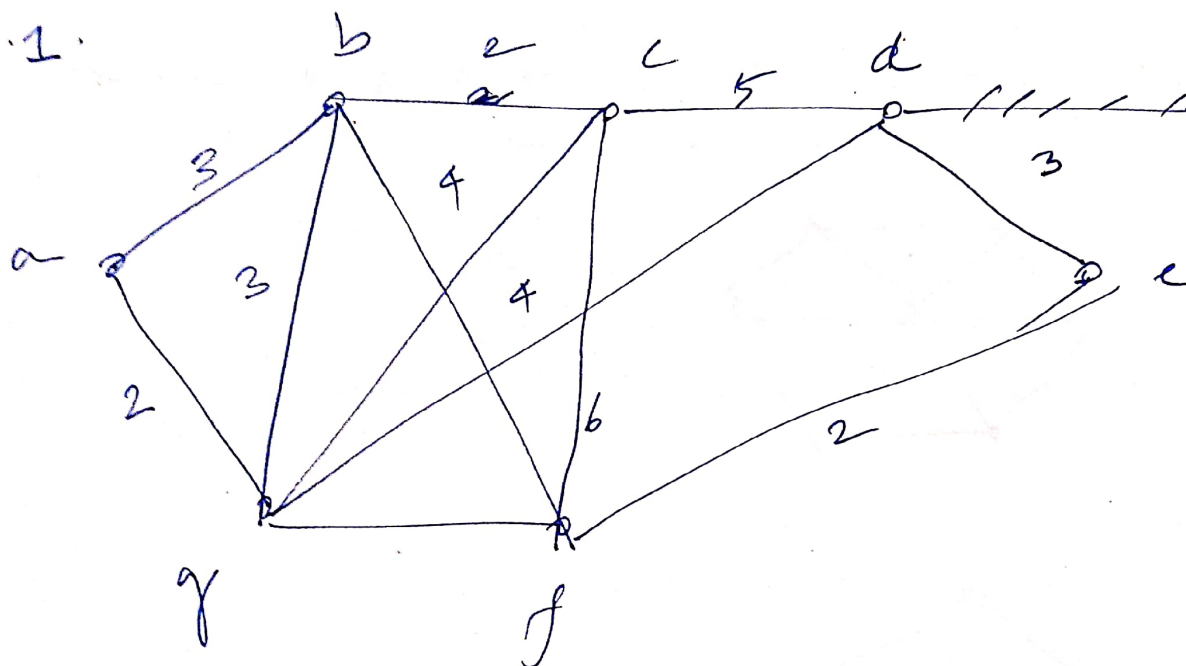
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PA20 ; A1

sy csf

Q.1.



⇒

| dist | a | b | c | d | e | f | g |
|------|---|---|---|---|---|---|---|
| a    | 0 | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |

adj vertices of a → b, g

$$d_1(b) = \min(\infty, 0+3) = 3$$

$$d_1(g) = \min(\infty, 0+2) = 2$$

⇒

| dist | a | b | c | d | e | f | g |
|------|---|---|---|---|---|---|---|
| a    | 0 | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| a    | 0 | 3 | ∞ | ∞ | ∞ | ∞ | 2 |

adj vertices of  $g \rightarrow b, c, d, f$

$$d_1(b) = \min(3, 2+2) \\ = 3$$

$$d_1(c) = \min(\infty, 2+4) \\ = 6$$

$$d_1(d) = \min(\infty, 2+4) \\ = 6$$

$$d_1(f) = \min(\infty, 2+6) \\ = 8$$

| dist | a | b        | c        | d        | e        | f        | g        |
|------|---|----------|----------|----------|----------|----------|----------|
| a    | 0 | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| a    | 0 | 3        | $\infty$ | $\infty$ | $\infty$ | $\infty$ | 2        |
| g    | 2 | (3)      | 6        | 6        | $\infty$ | 8        | 0        |



adj vertex of  $b = c, f$

$$d_1(c) = \min(6, 3+2) = 5$$

$$d_1(f) = \min(8, 3+5) = 8$$

| dist | a | b        | c        | d        | e        | f        | g        |
|------|---|----------|----------|----------|----------|----------|----------|
| a    | 0 | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| a    | 0 | 3        | $\infty$ | $\infty$ | $\infty$ | $\infty$ | 2        |
| g    | 2 | 3        | 6        | 6        | $\infty$ | 8        | 0        |
| b    | - | 0        | (5)      | 6        | $\infty$ | 8        | 2+3      |

adj vertex of  $c = d, f$

$$d_1(d) = \min(6, 5+5) = 6$$

$$d_1(f) = \min(8, 5+6) = 8$$

| dist | a | b        | c        | d        | e        | f        | g        |
|------|---|----------|----------|----------|----------|----------|----------|
| a    | - | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| a    | - | 3        | $\infty$ | $\infty$ | $\infty$ | $\infty$ | 2        |
| g    | - | 3        | 6        | 6        | $\infty$ | 8        | -        |
| b    | - | -        | 5        | 6        | $\infty$ | 8        | -        |
| c    | - | -        | -        | (6)      | $\infty$ | 1        | -        |

adj vertex of  $d = e$

$$d_1(e) = \min(\infty, 6+3) = 9$$

| dist | a | b | c | d | e   | f | g |
|------|---|---|---|---|-----|---|---|
| e d  | - | - | - | - | (9) | - | - |

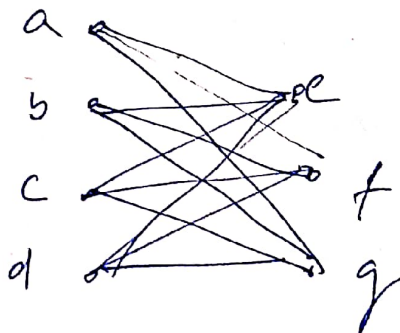
adj vertex of  $c = f$

$$d_1(f) = 9 \quad \min(1, 9+2) = 9$$

~~So  $\leftarrow$  min dist = 9 from a to f~~

| dist | a | b        | c        | d        | e        | f        | g        |
|------|---|----------|----------|----------|----------|----------|----------|
| a    | - | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| a    | - | 3        | $\infty$ | $\infty$ | $\infty$ | $\infty$ | 2        |
| g    | - | 3        | 6        | 6        | $\infty$ | 8        | -        |
| b    | - | 3        | 5        | 6        | $\infty$ | 8        | -        |
| c    | - | -        | -        | 6        | $\infty$ | 8        | -        |
| d    | - | -        | -        | -        | 9        | -        | -        |
| f    | - | -        | -        | -        | 9        | -        | -        |

Q.2.  $\kappa(G)$ ,  $\lambda(G)$  for  $K_{4,3}$



$$\lambda(G) = 3 \quad ; \quad \kappa(G) = 3$$

Q.3.  $G_1 =$  planar graph

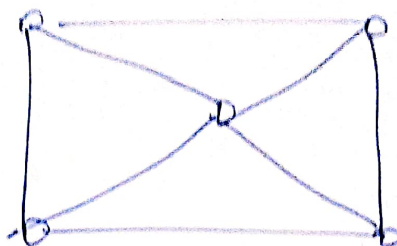
$G_2 =$  Eulerian graph & planar graph

$G_3 =$  Eulerian graph



Q.4.

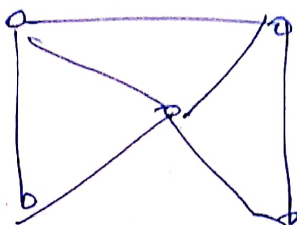
$G_1 \cup G_2$



$G_1 \cap G_2 =$

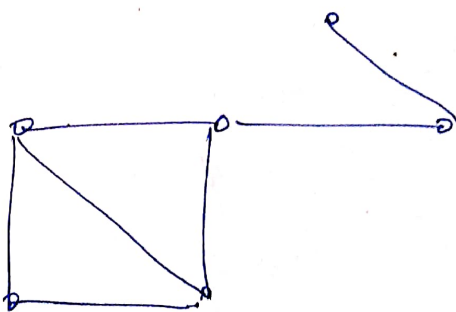


$G_1 \oplus G_2 =$



Q.5.

$G - e =$



$G - v =$

