Single Source Shortest Path
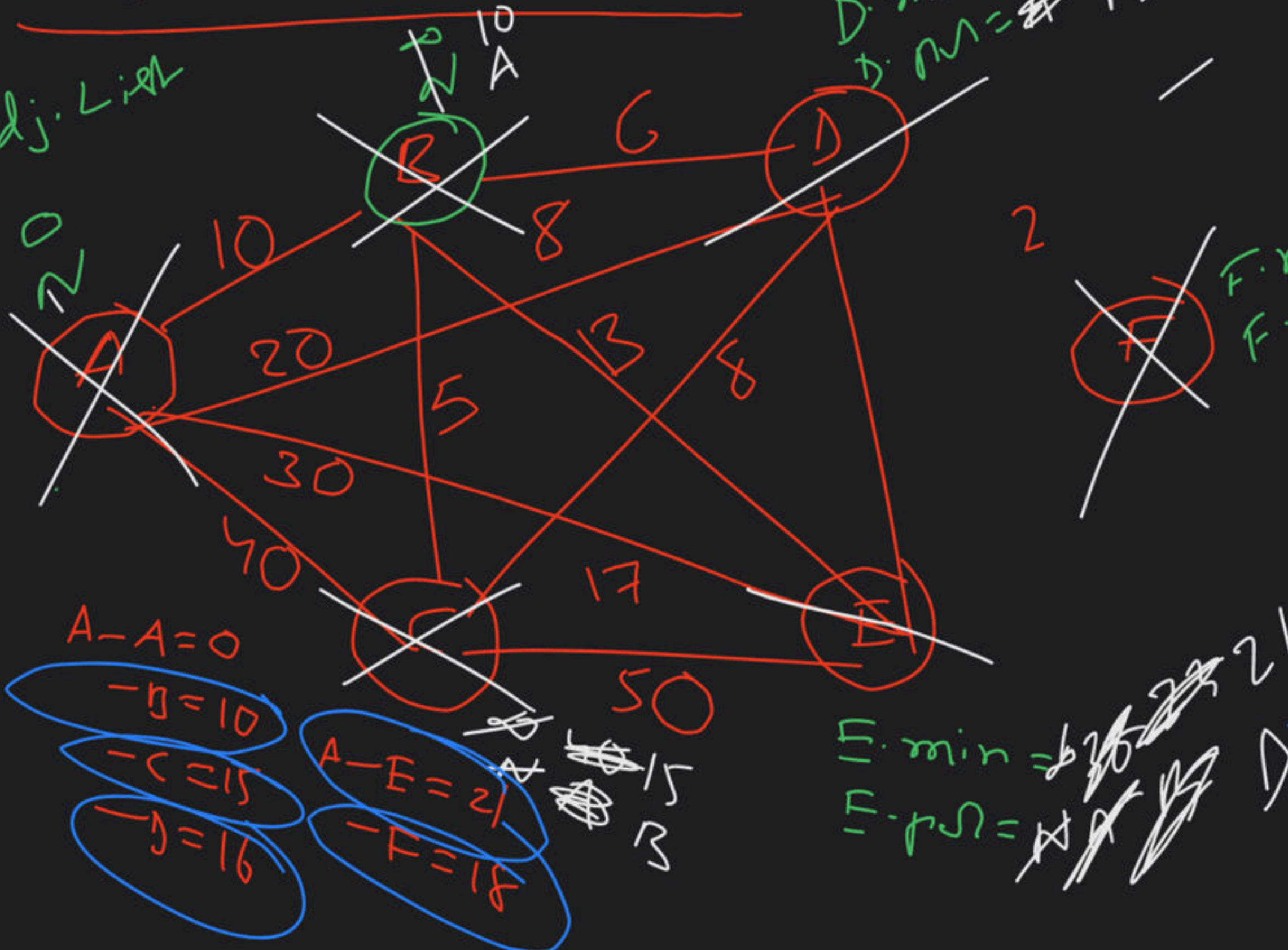
$$A \xrightarrow{10} B \xrightarrow{6} D \xrightarrow{5} E$$

Dijkstra's Algo

A	B	C	D	E	F
0	∞	∞	∞	∞	∞	⟹ V

Adj. List

D.min = ~~20~~ 16
D.∽ = ~~B~~ B

F.min = ~~∞~~ B
F.∽ = ~~∞~~ B

E.min = ~~∞~~ ~~20~~ ~~26~~ 21
E.∽ = ~~∞~~ ~~A~~ ~~B~~ D

A-A = 0
-B = 10
-C = 15
-D = 16

A-E = 21
-F = 18

log V

A

A	40	20	30	∞	⟹ 4+6(6...
A	A	A	A	N	

| 15 | 16 | 23 | 18 | ⟹ 5+4(V |
| B | B | B | B | |

| ∞ | 21 | 19 | ⟹ 15+3(V |
| B | B | B | |

| 21 | 18 | ⟹ 5+2(V |
| D | B | |

| 21 | ⟹ 8y + 1(V |
| D | |

⟹ 5+ log V

C
D
F
E

$$TC(Dijkstra's) = V \lg V + V + 2E + E \lg V \implies O((V+E) \lg V) \quad \textcircled{1}$$

wrt A.List & minheap

$$= V \lg V + V + V^2 + E \lg V \implies O(V^2 + E \lg V) \quad \textcircled{2}$$

wrt A.matrix & minheap

$$= V^2 + 2E + E*V \implies O(V^2) \quad \textcircled{3}$$

wrt A.L & array $\quad$ A.L & DLL

$$= V^2 + V^2 + |E| \implies O(V^2) \quad$$ wrt A.m & array $\quad \textcircled{4}$

$$= V \cdot 1 + 2E + E \cdot V \implies O(EV) \quad$$ wrt $\dfrac{\text{A.L \& Sorted array}}{\text{A.L \& S.DLL}} \quad \textcircled{5}$

$$= V \cdot 1 + V^2 + EV \implies O(V^2 + EV) \quad$$ " A.M " " $\quad \textcircled{6}$

$$= V^2 + 2E + |E| \implies O(V^2) \quad$$ wrt A.L & DLL