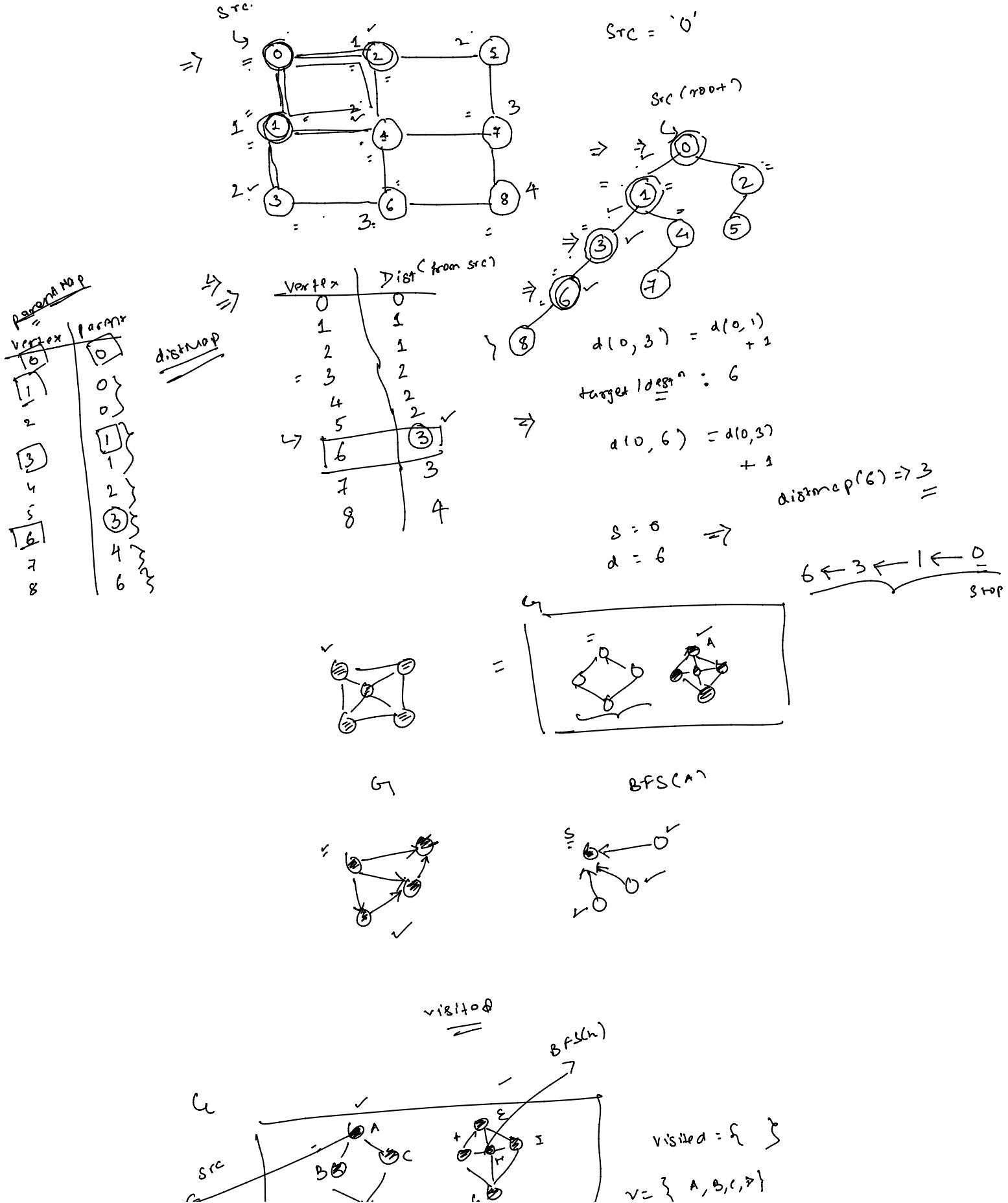
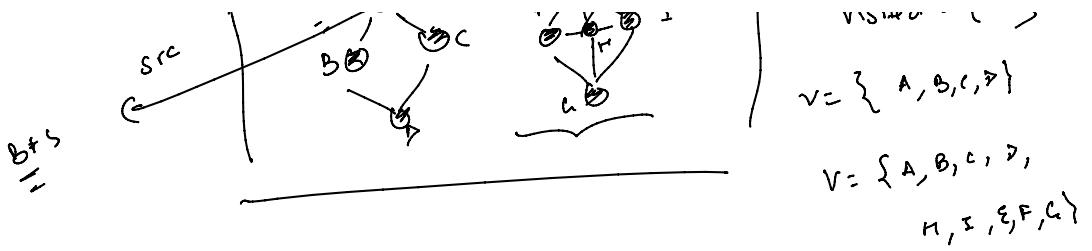


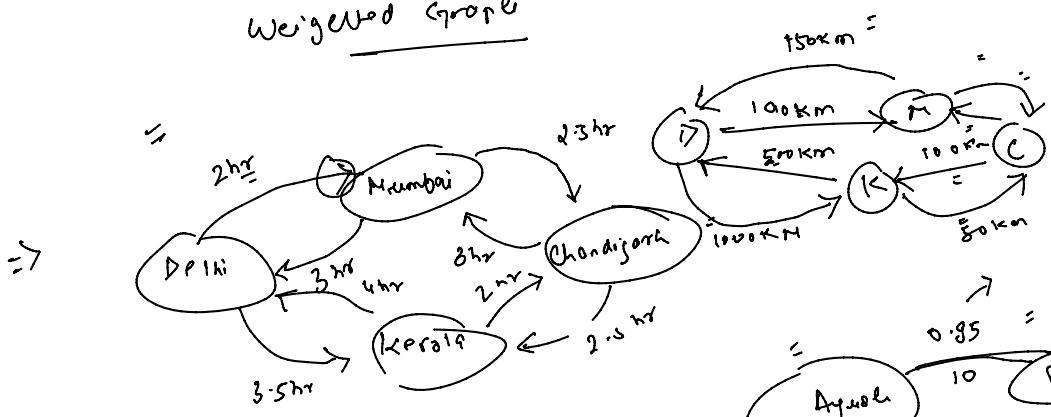
## Graphs II

25 August 2021 17:51



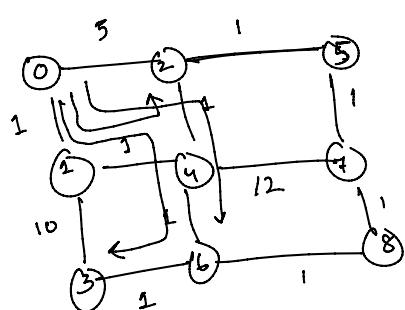
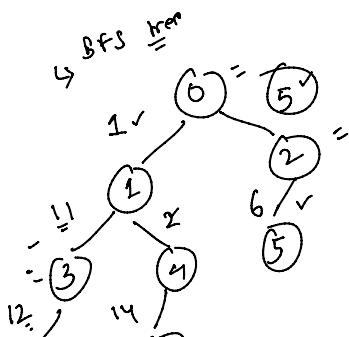
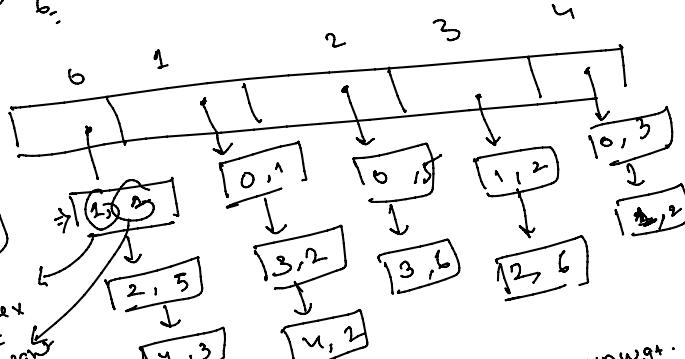
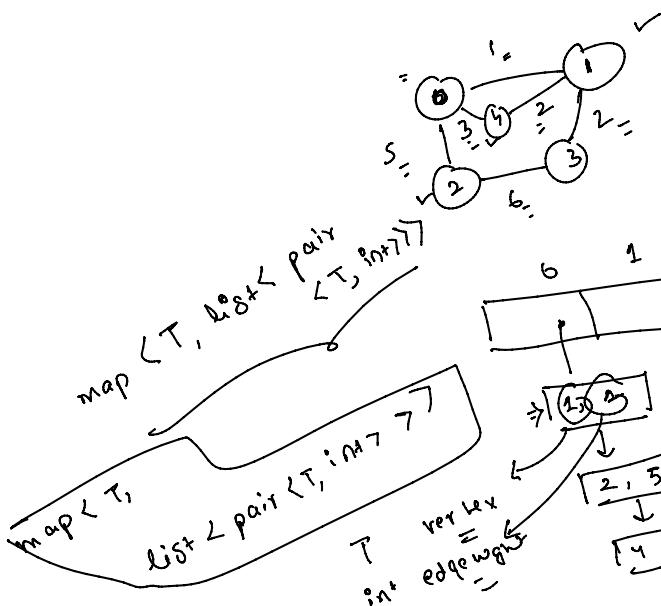
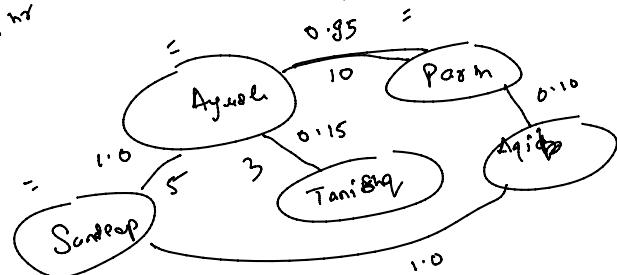


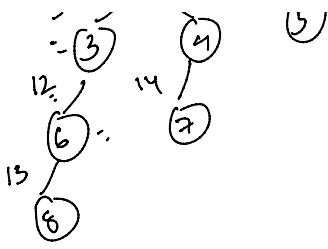
### Weighted Graph



Instagram

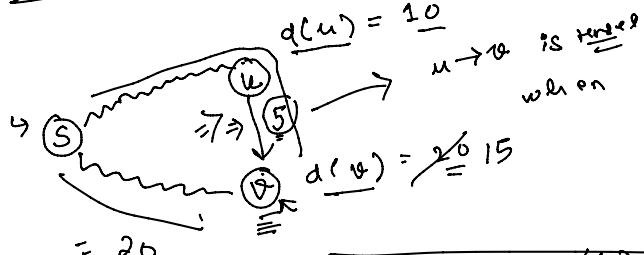
Friends





Dijkstra's

$$\text{relax} \quad d(v) = d(u) + u \rightarrow v$$

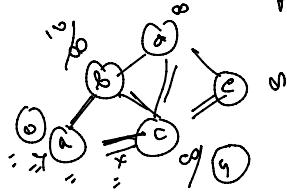
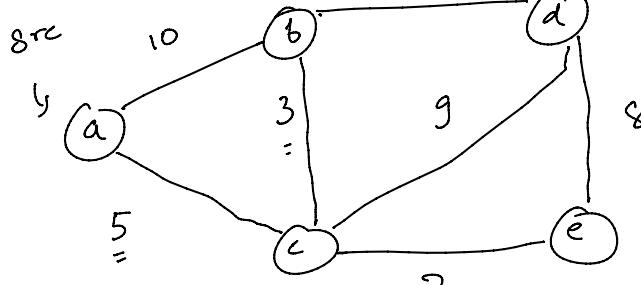


$$d(v) > d(u) + u \rightarrow v$$

$$20 > 10 + 5$$

$$d(v) = d(u) + u \rightarrow v \Rightarrow 20 \Rightarrow 15 ? \text{ yes}$$

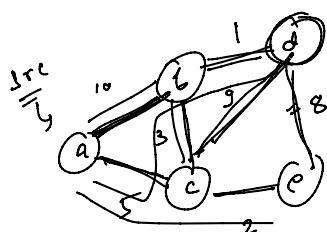
eg:	$d(v)$
vertices	$d(v)$
a	0
b	8
c	5
d	9
e	7



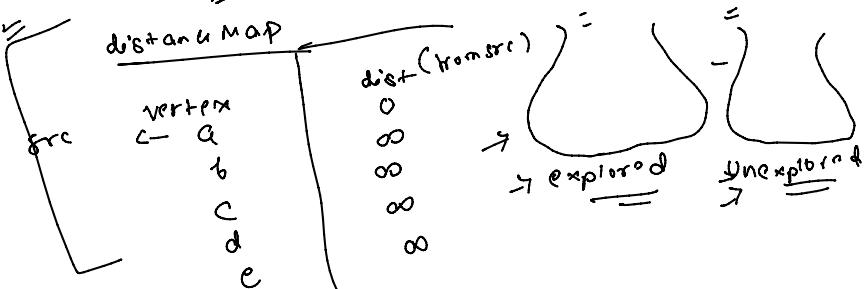
this is what we want

$$0 \xrightarrow{?} 5 \xrightarrow{?} 3 \xrightarrow{?} 1 \xrightarrow{?} 0$$

$$(0, 0) =$$



distanceMAP



$$\text{① } \xrightarrow{?} b \quad ? \quad d(b) > d(a) + 10 ? \quad \infty > 0 + 10 \Rightarrow \text{relax}$$

$$\xrightarrow{?} c \quad ? \quad d(c) > d(a) + 5 ? \quad \infty > 0 + 5 \Rightarrow \text{relax}$$

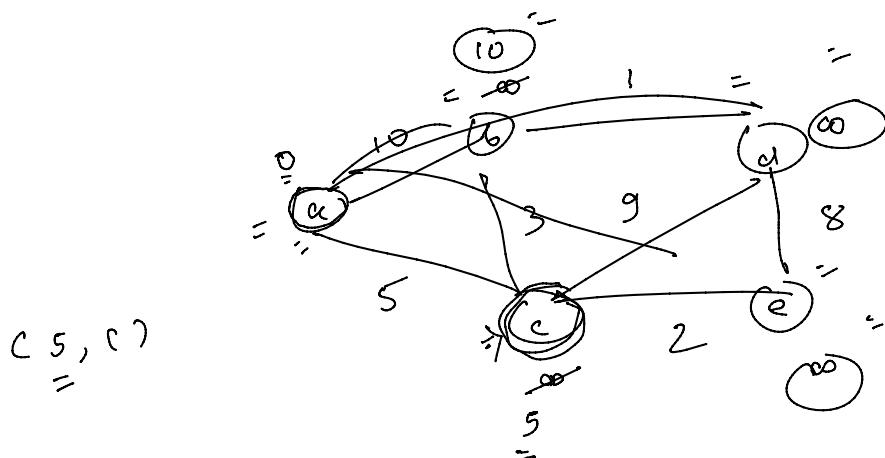
$$\xrightarrow{?} b \quad ? \quad d(b) > d(c) + 3 \Rightarrow 10 > 5 + 3$$

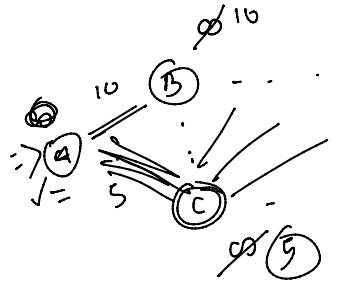
$$\xrightarrow{?} d \quad ? \quad d(d) > d(c) + 9 \Rightarrow \infty > 5 + 9$$

$$\xrightarrow{?} e \quad ? \quad d(e) > d(c) + 2 \Rightarrow \infty > 5 + 2$$

$$\text{explored} = \{a, c\} \quad \text{unexplored} = \{b, d, e\}$$

$$1 ? d(b) > d(b) + 1$$





*explained*

$$\times \underbrace{d(a)}_{0} \quad 7 \quad \underbrace{d(c) +}_{5+5} \quad a - c \quad \times$$