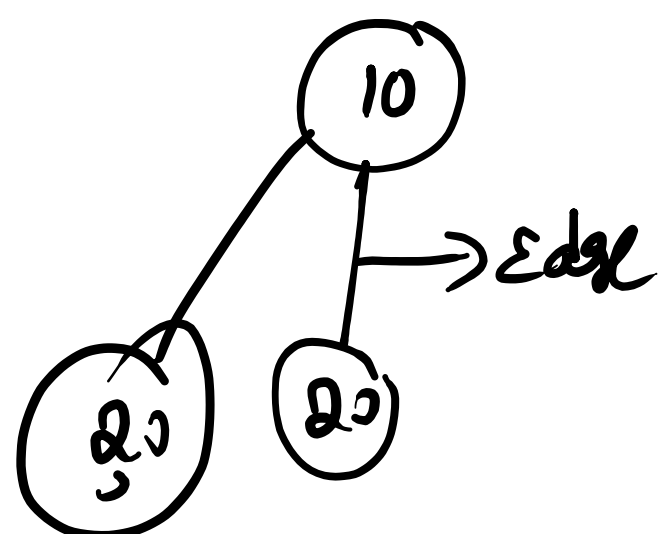


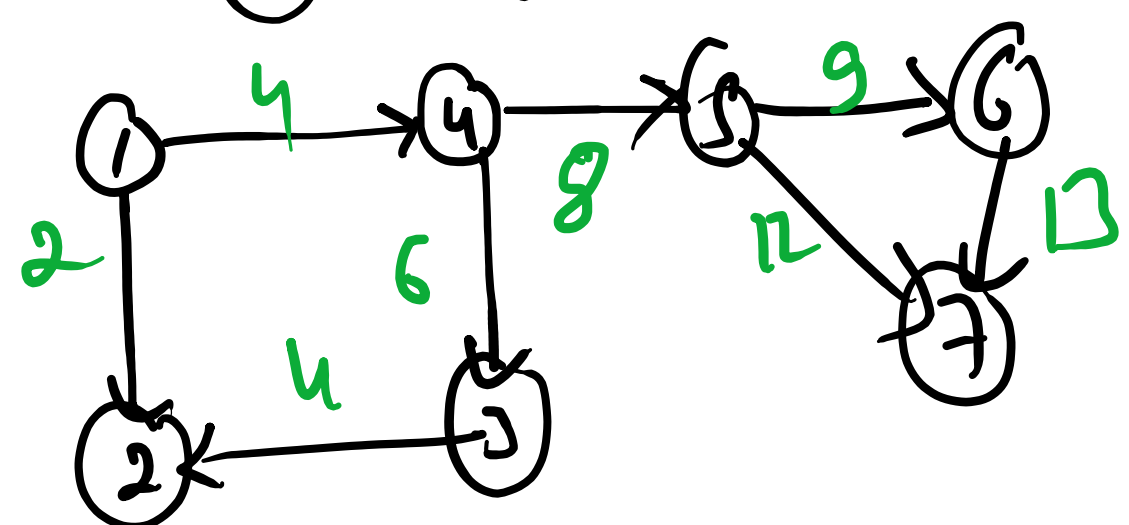
Graph

① finite set of edge vtx

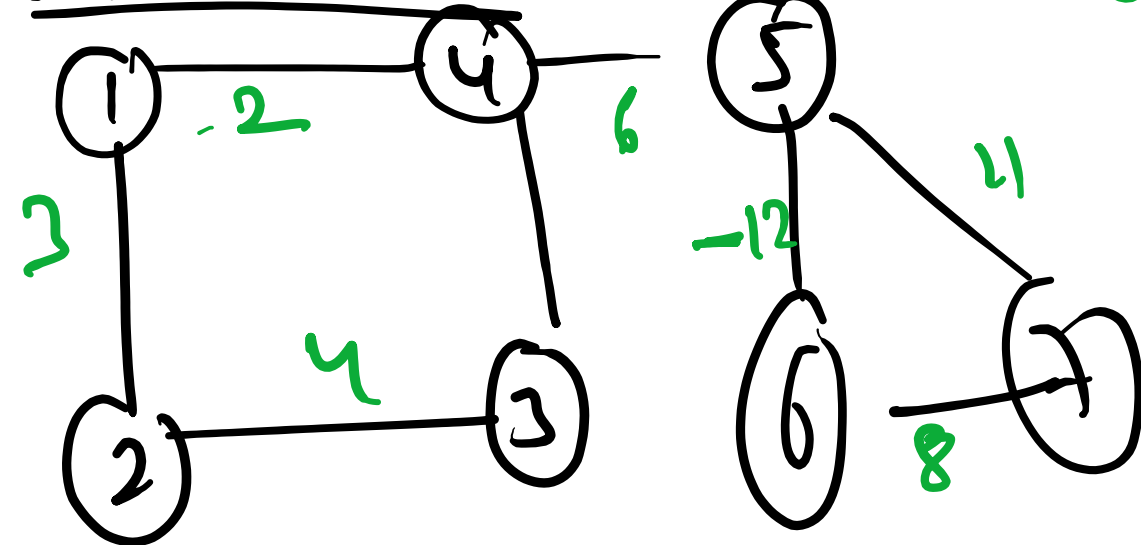


unweighted

① directed

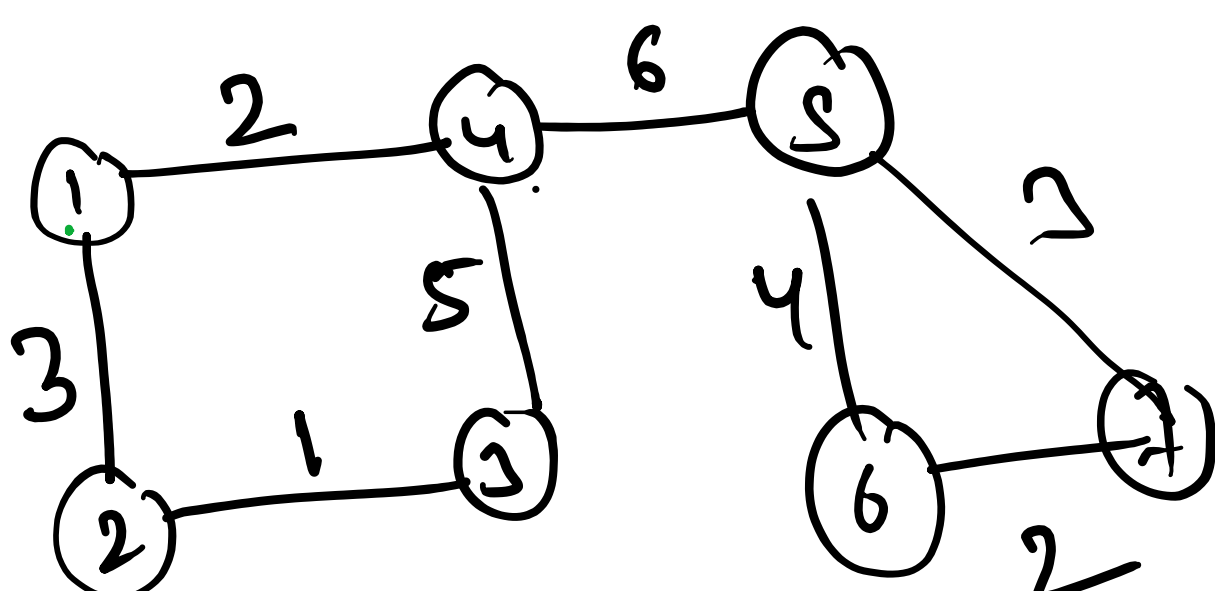


① undirected

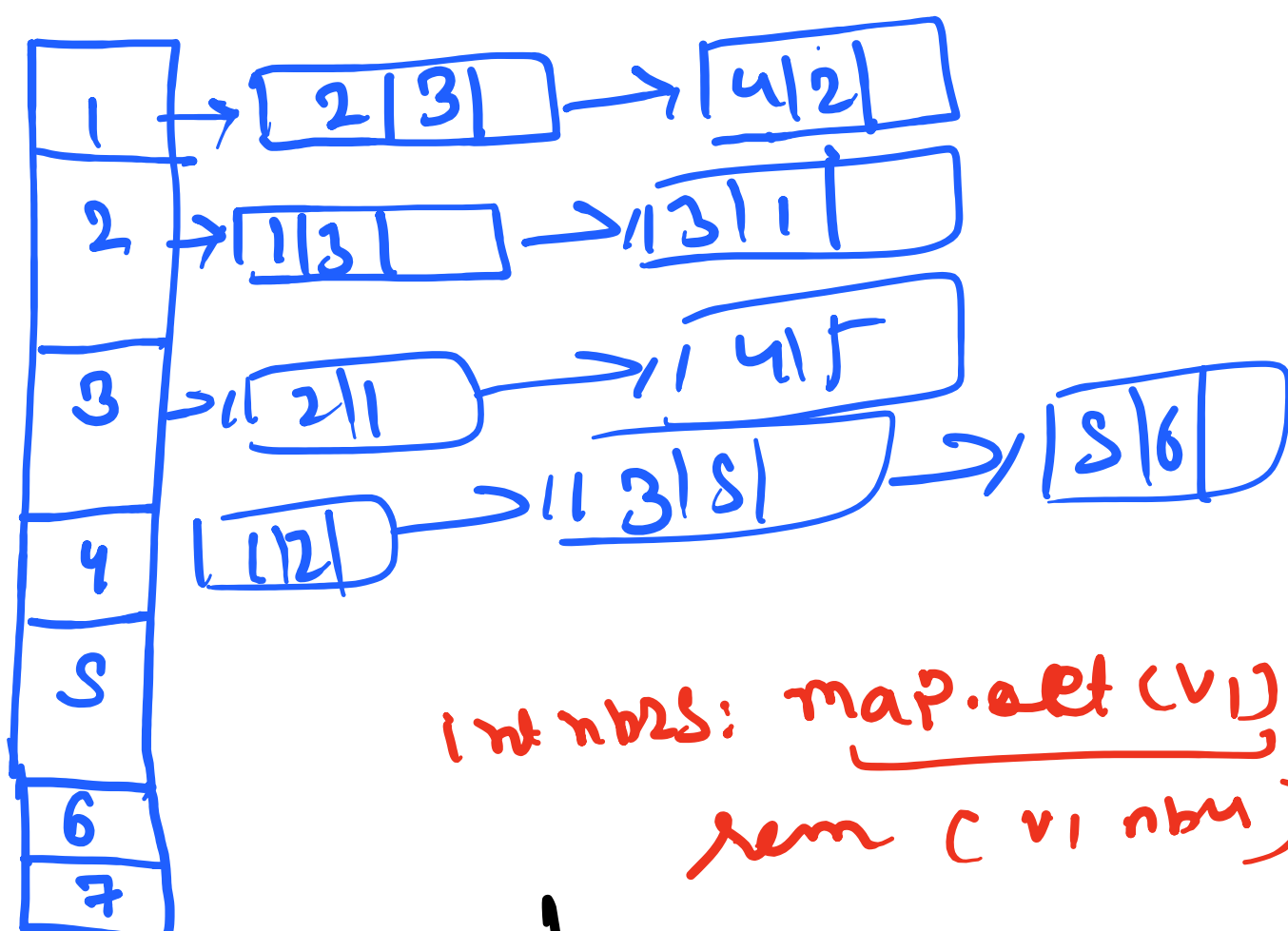


undirected weighted

	1	2	3	4	5	6	7
1	0	3	0	2	0	0	0
2	3	0	1	0	0	0	0
3	0	1	0	5	0	0	0
4	2	0	5	0	6	0	0
5	0	0	0	6	0	4	3
6	0	0	0	0	4	0	2
7	0	0	0	0	3	2	0



Adj list



T-C O(N)

int nbs: map.get(v1).keySet()
rem (v1, nbs)

for (int v: x) {

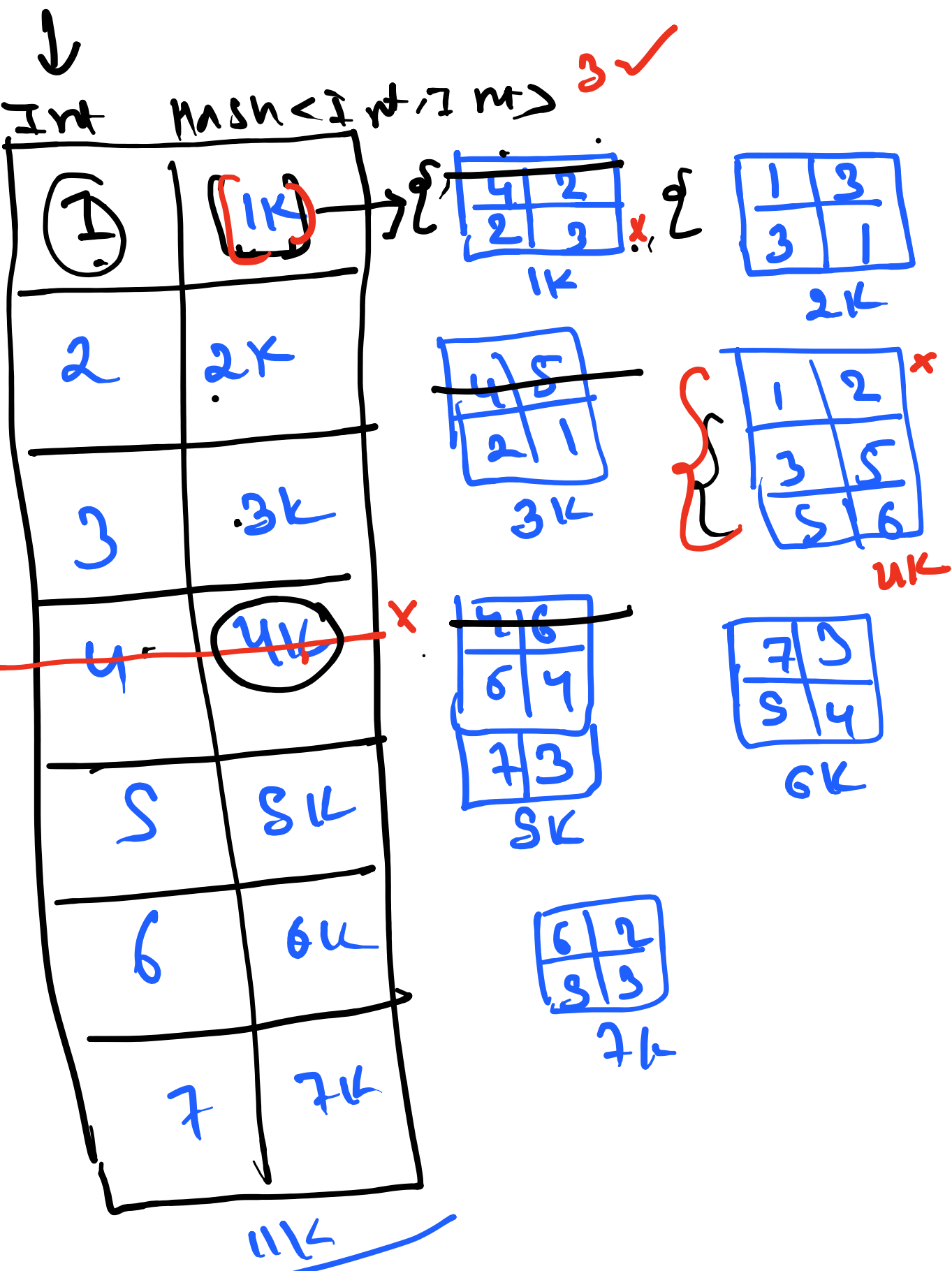
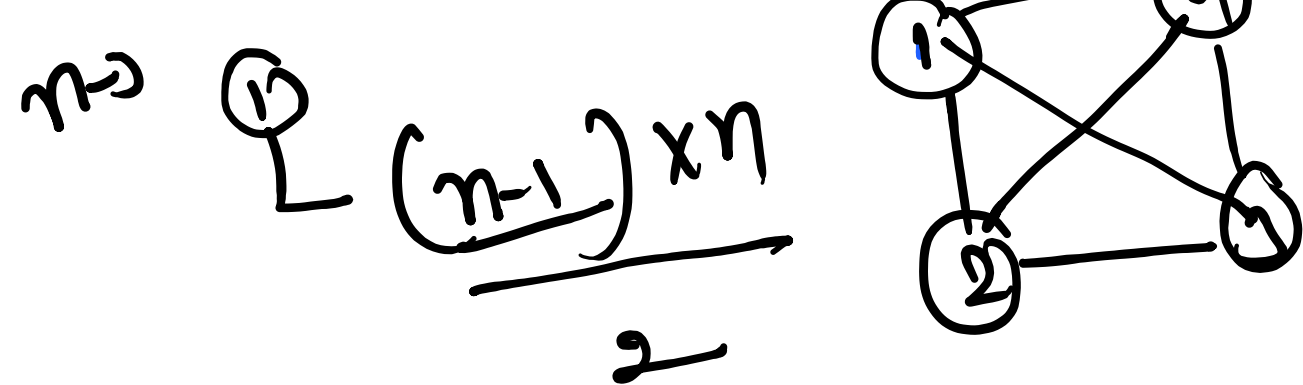
map.set

map.get(v1).put(v2, w)
v1=1 v2=3 w=2

2+2+2+2+2+2+2

$$\frac{16}{2} = 8 \checkmark$$

complete graph



```
public void removevertex(int v1) {
    for (int nbs : map.get(v1).keySet()) {
        map.remove(nbs, v1);
    }
    map.remove(v1);
}
```