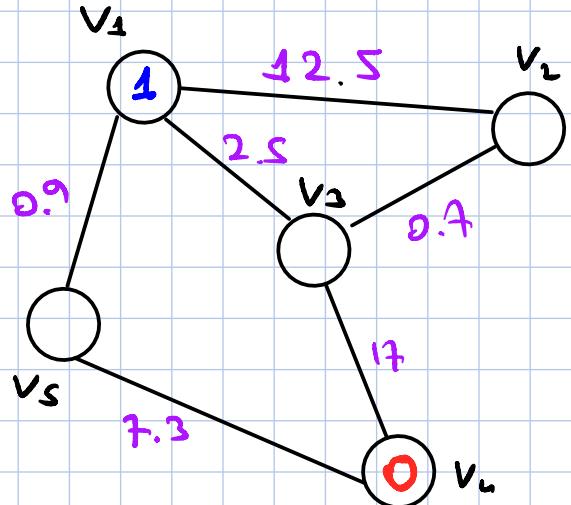


CLASSIFICATION IN GRAPHS



- Weighted graph - (G, w)
- partial labels - '0' OR '1'
- Find labeling for all vertices

that 'makes sense'

- Labeled vertices: $V_L \subset V$
- Unlabeled vertices: $V_U \subset V$
- looking for: $f: V \rightarrow [0, 1]$

'0' \Leftarrow below $\frac{1}{2}$

above $\frac{1}{2} \Rightarrow '1'$

OPTIMISATION PROBLEM:

$$f^* = \underset{f}{\operatorname{argmin}} \left\{ \| M \cdot f \|^2_2 \right\}$$

subject to
 incidence matrix $\approx \nabla +$
 $f(v_i) = y_i$
 $i \in V_L$

given
label