5/14 Connection & Tree

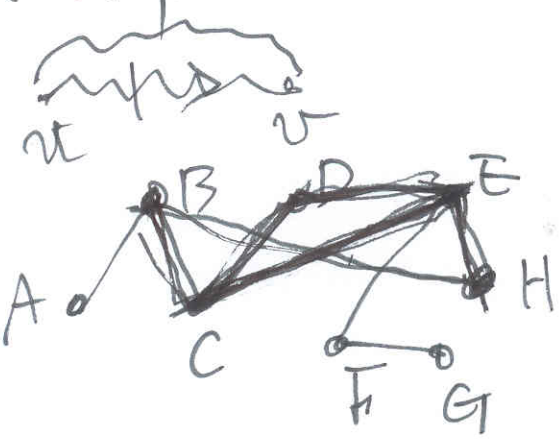
∃ path between u and v → u Connected v

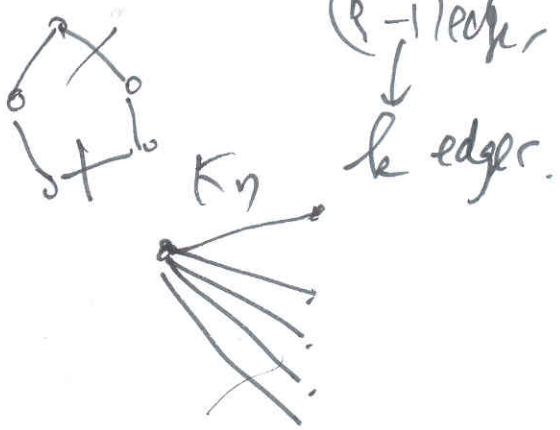
Connected $\subseteq V \times V$ ... equivalence relation

∴ partition — equiv. classes — connected component.

(set of)

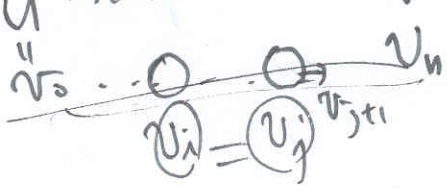
Def. k-connected.





C_3, C_4, C_5

Thm 1. Connected → Simple path



Simple ✗

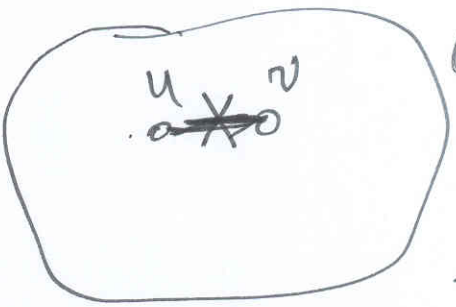
$1 \le i < j \le n$

$v_0 .. v_i \; v_{j+1} .. v_n \quad v_i = v_j$

$\{v_i, v_{j+1}\} \in E$.

$G = (V, E)$

Thm 1.1

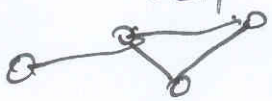


$G' = (V, E')$

$E' = E - \{u, v\}$

$\{u, v\} \in E$.

$|E| \ge |V| - 1$



n vertices, (n-1) edges.

2/ Tree .. connected graph
acyclic

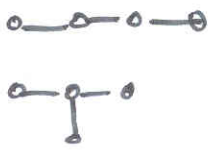
$v=1$ •$_v$

$v=2$ —

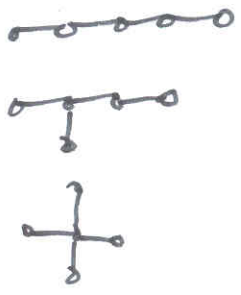
$v=3$ 

path .. a seq. vertices
$(v_0, v_1, \ldots v_n)$ $n \geq 0$.

(v_0) if $n=0$
— a path of length 0

$v=4$ 

(v_0, v_1) if $n=1$
a path of length 1
|| edge

$v=5$ 

$v=6$? 

$v=n$???