HW #3 → due Oct 10, Mon midnight / email

1. Can a directed graph compute?
   if so, How / if not, why

2. Quicksort → implement → C, C#, Java, Python, etc...

1. Directed graph $G = (V, E)$

V = a finite set ($\neq \emptyset$) nodes

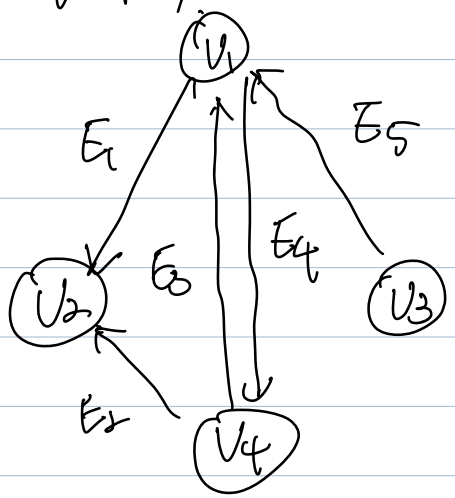
$V \times V$: the set of all ordered pairs of element in V

$V = \{a, b\}$ $V \times V = \{(a,a), (b,a), (b,b)\}$

E = is a relation on V

A directed graphs is a set of vertices and a collection of directed edges that each connects an ordered pair of vertices.

Ex) In directed graph,



$\{V_1, V_2\}$
$\{V_1, V_4\}$
$\{V_3, V_1\}$

A tree is a graph Edges $E_{1\sim5}$ which have direction, there are 2 kinds of edges: outgoing edges, incoming edge

so we can say
$OE_G(V_1) = 2\ (E_1, E_4)$
$OE_G(V_2) = 0$
$OE_G(V_3) = 1\ (E_5)$
$IE_G(V_4) = 1\ (E_4)$

can these be computed?

we can use Each outgoing, incoming edges as weights. to show compute?