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① set $A = \{1, 2, 3, 4, 5, 6\}$

$$R = \{(a, b) \mid a * b < 6, a \in A, b \in A\}$$

a. $R = \{(1, 1), (1, 2), (1, 3), (1, 4), (1, 5),$
 $(2, 1), (2, 2), (3, 1), (4, 1), (5, 1)\}$

b. domain = $\{1, 2, 3, 4, 5, 6\}$

range = $\{1, 2, 3, 4, 5\}$

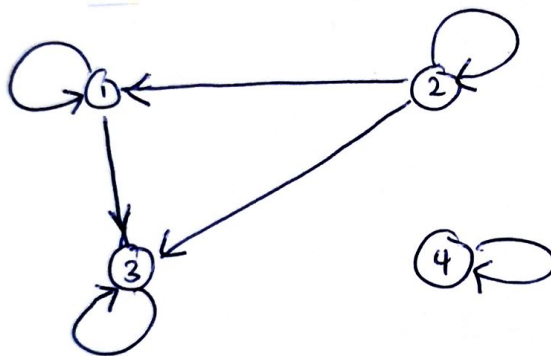


② $S = \{(1,1), (1,3), (2,1), (2,2), (2,3), (3,3), (4,4)\}$

set $X = \{1, 2, 3, 4\}$

a. $S = \begin{matrix} & \begin{matrix} 1 & 2 & 3 & 4 \end{matrix} \\ \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \end{matrix} & \begin{bmatrix} 1 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

b.



in degree	out degree
1 - 2	1 - 2
2 - 1	2 - 3
3 - 3	3 - 1
4 - 1	4 - 1

c. S is ^{not} a partial order relation.

→ - S has reflexive ~~func~~ relation

- consists of all '1's in diagonal

→ - S has anti symmetric relation

- no elements is repeated such as (a,b) and (b,a)

→ - S is not transitive

- $S \circ S \neq S$

1	0	1	0
1	1	1	0
0	0	1	0
0	0	0	1