CS 3143: Automation Theory and Formal Languages
Discrete Math Review
Relations Seatwork

1. List the relation as a set of ordered pairs of digraph 1.

2. List the relation as a set of ordered pairs of digraph 2.

3. List the relation as a set of ordered pairs of digraph 3.

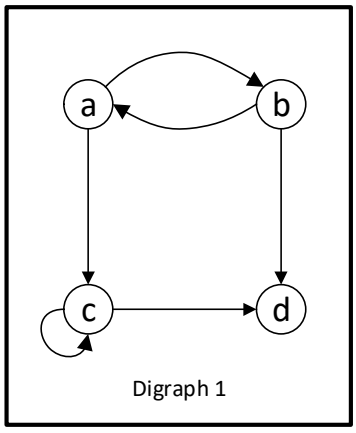
4. The relation $R = \{(1,2), (2,1), (3,3), (1,1), (2,2)\}$ on $X = \{ 1, 2, 3\}$. Create Relation Matrix.

5. The relation $R = \{(a, b), (c, b), (c, d), (d, a)\}$ on $X = \{ a, b, c, d\}$. Create Relation Matrix.

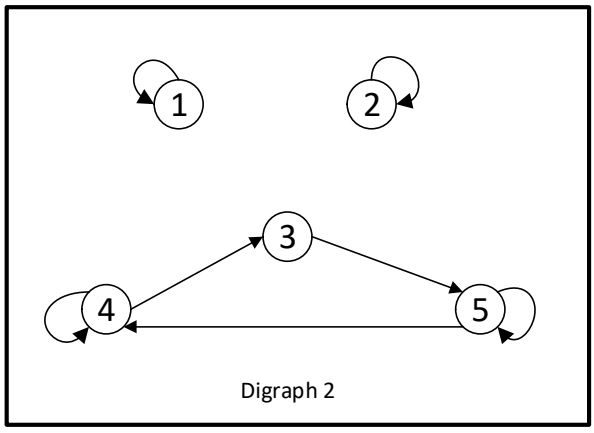
6. List the elements of R on the set $\{ 1, 2, 3, 4, 5\}$ defined by the rule $(x, y) \in R$ if $x + y \leq 6$.

7. List the elements of R on the set $\{ 1, 2, 3, 4, 5\}$ defined by the rule $(x, y) \in R$ if $x = y - 1$.

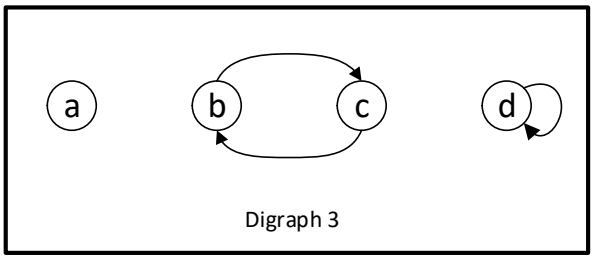
8. Determine whether each relation defined on the sets from number 1 to 7 questions is reflexive, symmetric, antisymmetric, and/or transitive.



Digraph 1



Digraph 2



Digraph 3