Homework II: Directed Graphs
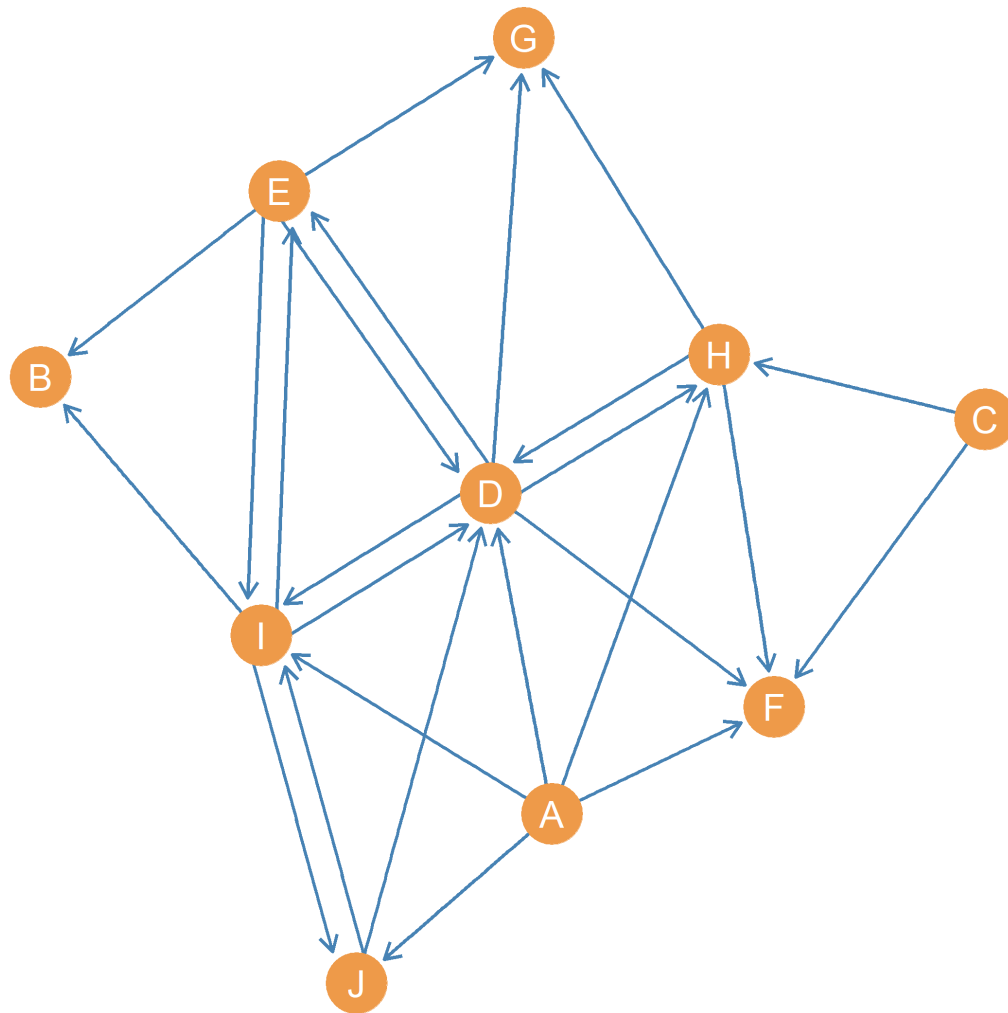

Figure 1: A directed graph.

Consider the graph shown in Figure 1:

1. Write down the **edge set** of the graph:

2. Who are the **out-neighbors** of node *A*?

3. Who are the **in-neighbors** of node *D*?

4. What is the **intersection** of the **out-neighborhoods** of nodes *D* and *A*?

5. What is the **intersection** of the **in-neighborhoods** of nodes *D* and *F*?

6. What is the **union** of the **out-neighborhoods** of nodes *E* and *A*?

7. What is the **union** of the **in-neighborhoods** of nodes *D* and *F*?

8. What is the **out-degree** of node *E*?

9. What is the **in-degree** of node *D*?

10. What is(are) the node(s) with the largest **out-degree**?

11. What is(are) the node(s) with the largest **in-degree**?

12. What is(are) the node(s) with the smallest **out-degree**?

13. What is(are) the node(s) with the smallest **in-degree**?

14. Which is(are) the **receiver node(s)** in the graph?

15. Which is(are) the **transmitter node(s)** in the graph?

16. Write down the set of **mutual dyads** in the graph:

17. What type of **dyad** is formed by the subgraph containing nodes *C* and *F*?

18. What type of **dyad** is formed by the subgraph containing nodes *B* and *C*?

19. What type of **dyad** is formed by the subgraph containing nodes *E* and *I*?

20. How many **mutual dyads** are there in the graph?