Omar Lizardo’s Academic Website - Homework I: Graph Theory

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* [Blog](../blog.html)
* [Teaching](#Xa39a3ee5e6b4b0d3255bfef95601890afd80709)
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  + [SOCIOL 204 (Topics in Sociological Theorizing Spring 2025)](../syllabi/SOCIOL204-sp25.html)
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  + [SOCIOL 245 (Cultural Sociology)](../syllabi/SOCIOL245.html)
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## On this page

* [Vertex and edge sets](#vertex-and-edge-sets)
* [Node Neighborhoods](#node-neighborhoods)
* [Graph Metrics](#graph-metrics)
* [Subgraphs](#subgraphs)

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# Homework I: Graph Theory

## Vertex and edge sets

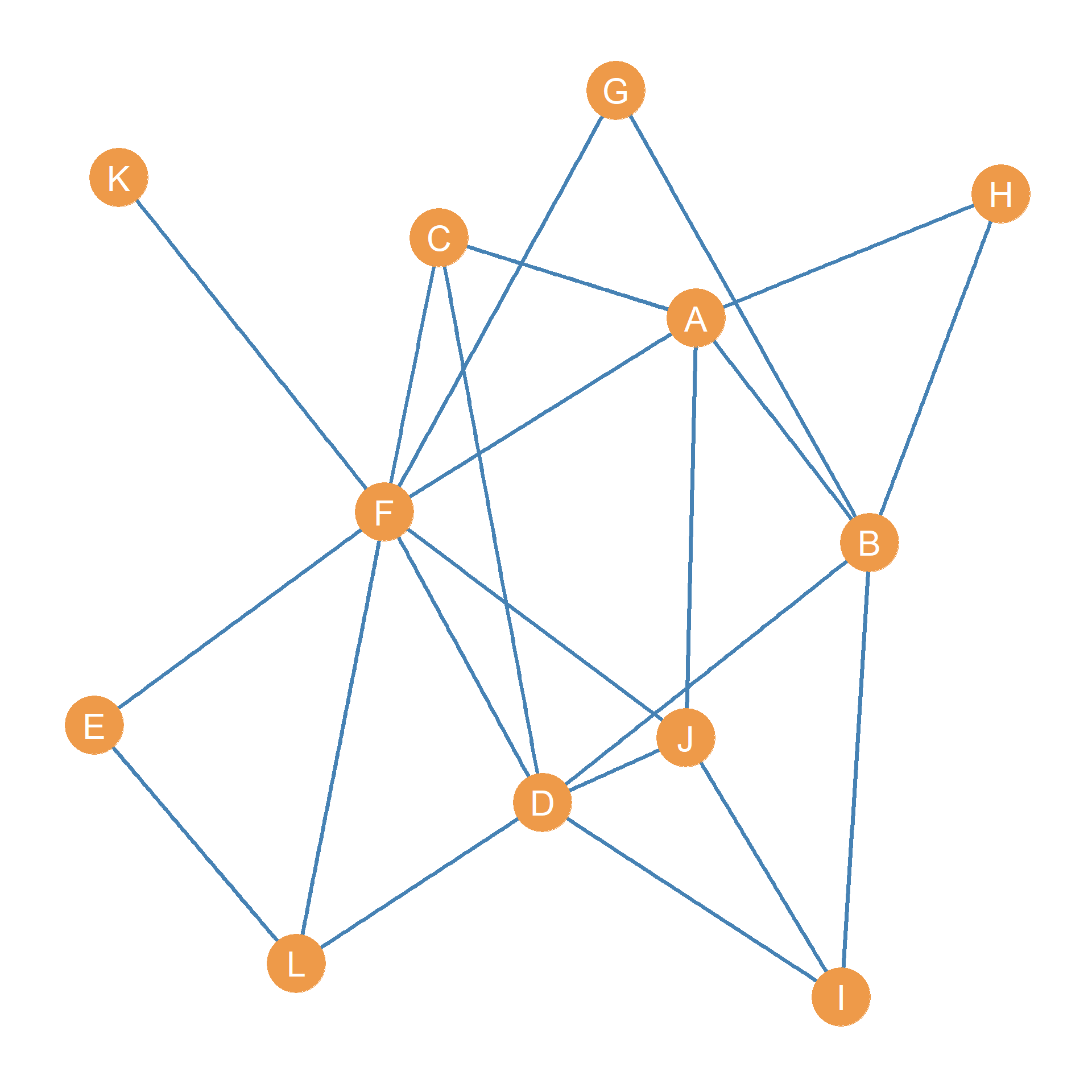


Figure 1: A simple graph.

Consider the graph shown in [Figure 1](#fig-grex1):

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

## Node Neighborhoods

1. Write down the **neighborhood** of node **F**
2. Write down the **neighborhood** of node **J**
3. What is the **intersection** of the neighborhoods of nodes **F** and **J**?
4. What is the **intersection** of the neighborhoods of nodes **A** and **F**?
5. What is the **union** of the neighborhoods of nodes **H** and **J**?

## Graph Metrics

1. What is the **order** of the graph?
2. What is the **size** of the graph?
3. Write down the graph’s **degree sequence**:
4. Write down the graph’s **maximum Degree**:
5. Write down the graph’s **minimum degree**:
6. What is the graph’s **degree range**?
7. What is the graph’s **sum of degrees**?
8. What is the graph’s **average degree**?
9. What is the graph’s **maximum size**?
10. Compute the **density** of the graph:

## Subgraphs

1. Go back to [Figure 1](#fig-grex1). Draw the **node-deleted** subgraph of this graph that *excludes* nodes *D*, *F*, and *J*
2. List the **isolate** nodes in the node-deleted subgraph you obtained in the previous step.