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

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[View source](https://github.com/olizardo/mysite/blob/main/soc-111-homeworks/homework1-answered.qmd)

# Homework I: Graph Theory

## Vertex and edge sets

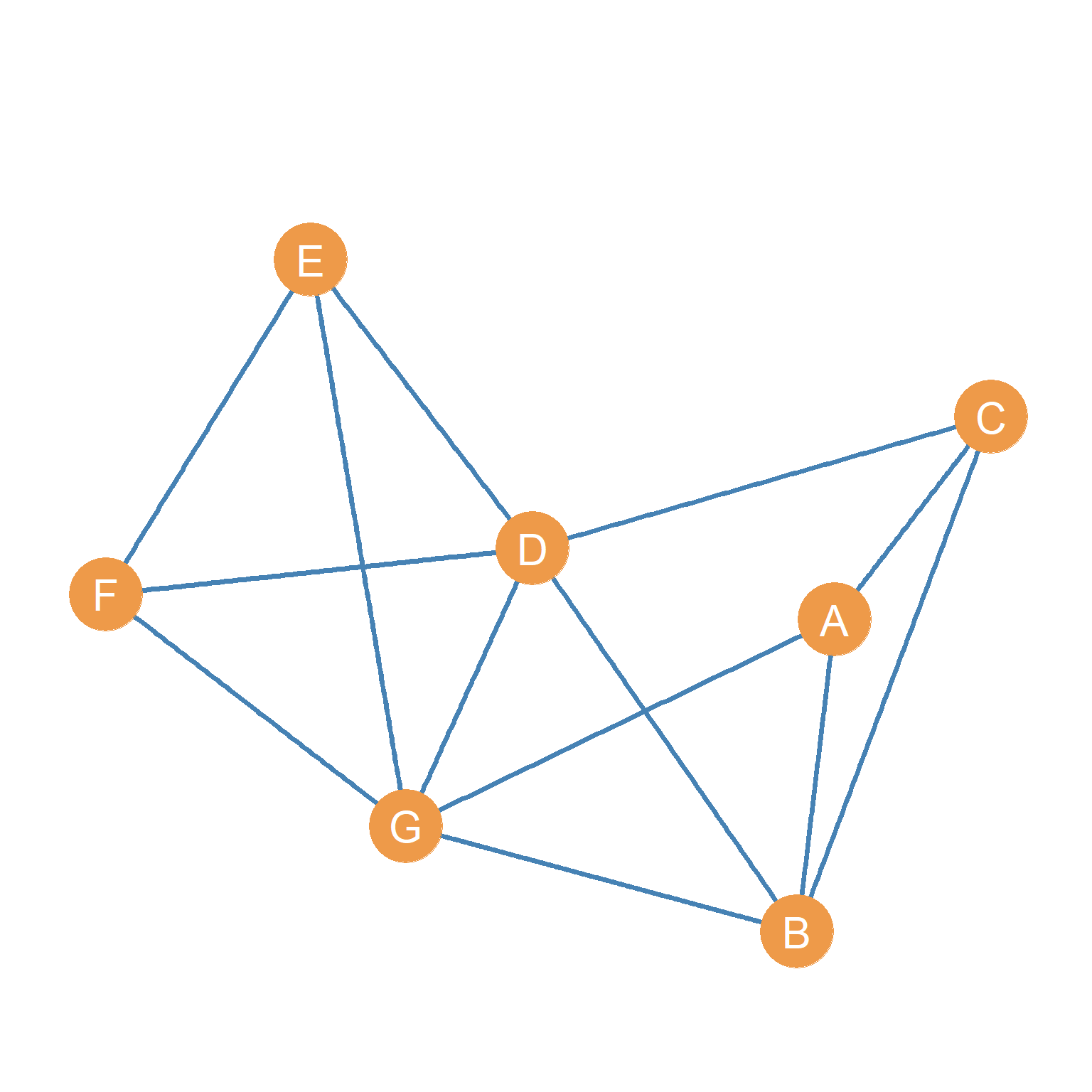


Figure 1: A simple graph.

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

1. Write down the **vertex set** of the graph:  
   A, B, C, D, E, F, G, H  
   VA, VB, VC, VD, VE, VF, VG, VH
2. Write down the **edge set** of the graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AB | AC | BC | BD | CD | DE | DF | EF | AG | BG | DG | EG | FG | AH | CH | EH |

## Node Neighborhoods

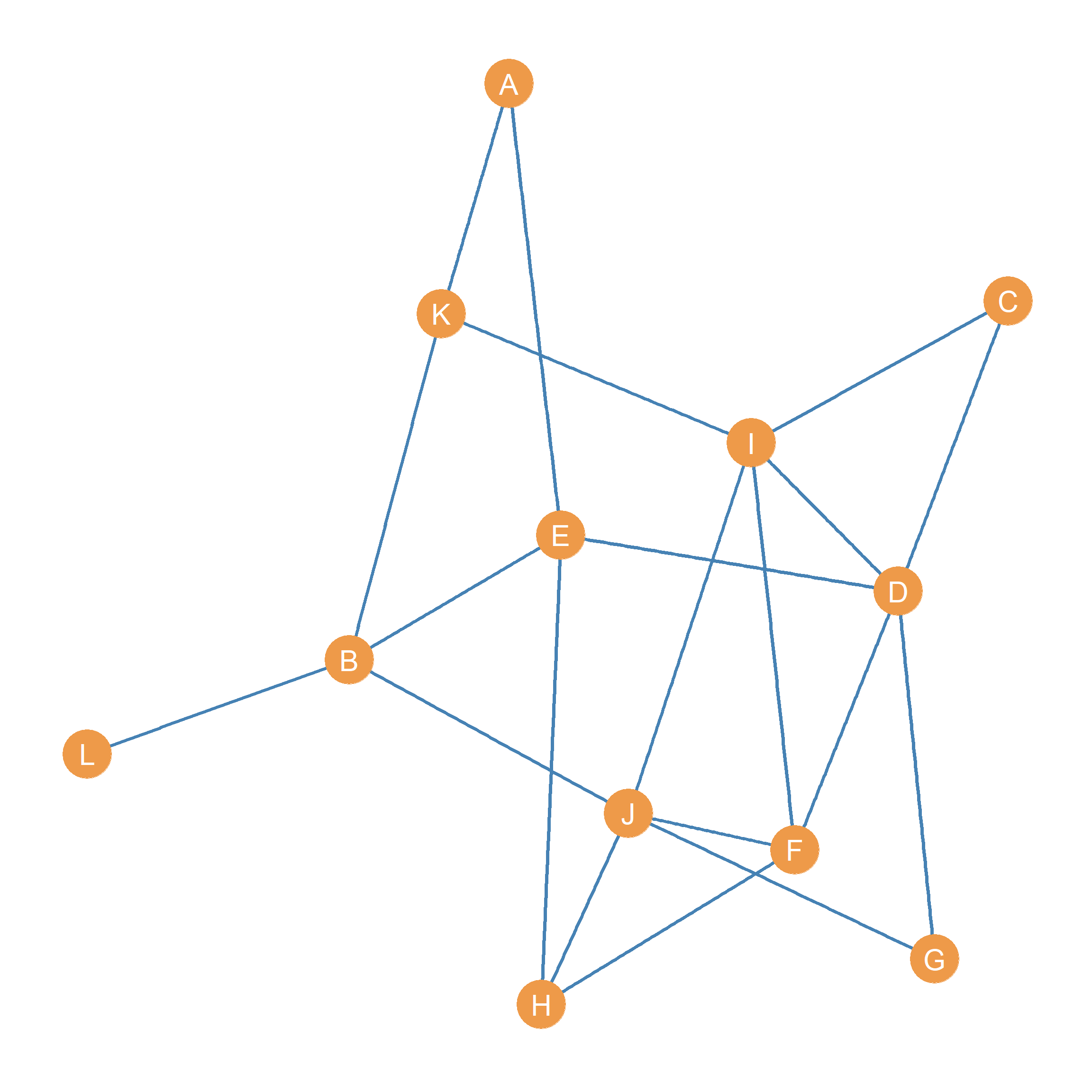


Figure 2: Another simple graph.

Consider the graph shown in [Figure 2](#fig-grex2):

1. Write down the **neighborhood** of node *D*  
   C, E, F, G, I
2. Write down the **neighborhood** of node *K*  
   A, B, I
3. What is the **intersection** of the neighborhoods of nodes *D* and *I*?  
   C, F
4. What is the **intersection** of the neighborhoods of nodes *E* and *F*?  
   D, H
5. What is the **union** of the neighborhoods of nodes *H* and *J*?  
   A, B, D, H, I, J

## Node Degree

Consider the graph shown in [Figure 2](#fig-grex2):

1. What is the **degree** of node *B*?  
   4
2. What is(are) the node(s) with the largest **degree**?  
   5
3. What is(are) the node(s) with the smallest **degree**?  
   1

## Subgraphs

1. Go back to [Figure 1](#fig-grex1). Draw the **node-deleted** subgraph of this graph that *excludes* nodes *D* and *G*

