# Network Graphs: Romeo & Juliet

One method of visualizing interactions is to use a *vertex–edge* *graph*. A vertex–edge graph is a mathematical structure that represents pairwise relationships between objects. Each object in the graph is represented by a *node* (vertex) and relationships between objects are represented by *edges* connecting the related nodes. These graphs, which are often used to visualize social interactions or relationships between people, are abstractions of social networks and are typically referred to as *social network graphs* or just *network graphs*.

Network graphs can be *directed,* or *undirected.* In an undirected graph, the edges represent a two-way relationship, whereas in a directed graph, the edges represent a one-way relationship. Network graphs can also include additional information that helps you make sense of the relationships. This information might be based on data collected about the nodes (node attributes) or edges (edge attributes). These data are then mapped to aesthetics (e.g., color, size, thickness, position) that can be perceived on the graph. These mappings of attributes to aesthetics are referred to as *aesthetic mappings*.

## Task 4: Understanding Network Graphs

Examine the network graph below that maps interactions between players in Shakespeare’s *Romeo & Juliet*. Two players are connected if they share interactions of at least 30 lines. Use this graph to answer the following questions.

1. What do the nodes represent in this graph?
2. What do the edges represent in this graph?
3. Identify all the node attributes and their aesthetic mappings in this graph.
4. Identify all the edge attributes and their aesthetic mappings in this graph.
5. What do you suppose the thicker edges represent in this graph?
6. This network graph is plotted in two-dimensional space. Do you think the *X* and *Y* coordinates (e.g., position) have meaning in this graph? Explain.
7. The double-headed edges (arrows at both ends of the edge) imply that this is an undirected graph. Why is an undirected graph more appropriate to represent this context than a directed graph?
8. Come up with a context/example (or two) that would be more appropriate to represent using a directed graph.
9. What are two things about the play *Romeo & Juliet* you can infer from this graph? (Be specific.)

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