1 Dependency Links

Let's practice identifying and representing dependencies between flow rates and stocks. For each stock-flow model below, create a system diagram with dependency links. Use the interactive as needed if it is helpful to recall the various components that comprise a system diagram.

Write a short description of what you think the dependency is and how it will affect the flow rate.

1. **Stock:** Number of undergraduate students at a University

   Flows: Admitted students, graduating students

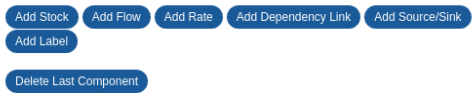

Figure: A blank space to construct a system diagram.

2. **Stock:** Population of a community

   Flows: Births, deaths

Figure: A blank space to construct a system diagram.

3. Pick one system that your group identified interest in from Section 2.1.

2 Equilibrium Values

Let's continue to practice finding equilibrium values for stocks that have dependent links to flow rates. For each stock-flow model below,

- Sketch a system diagram on paper with the indicated dependency links.
- Compute the equilibrium value of the stock.
- Use the computed equilibrium value to describe the behavior of the system.

1. ***Stock:*** Number of undergraduate students at a University
Flows: Admitted students, graduating students
Rates:

- Graduation rate is constant at $2,000$ students per year
- Admission rate (A) depends on the number of undergrads (U):

$$A = 25,000 - U$$

2. ***Stock:*** Population of a community
Flows: Births, deaths
Rates:

- Death rate is constant at $1,000$ individuals per year
- Birth rate (B) depends on the population (P):

$$B = 0.25P$$

3. ***Stock:*** Population of a community
Flows: Births, deaths
Rates:

- Death rate (D) depends on the population (P):

$$D = 0.15P$$

- Birth rate (B) depends on the population (P):

$$B = 0.25P$$