State-Space Realizations

$$\dot{x} = Ax + Bu$$
$$y = Cx$$

with input u and output y.
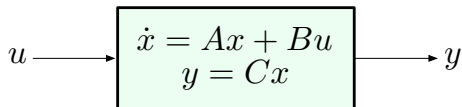
- a given transfer function $G(s)$ can be realized using infinitely many state-space models
- certain properties make some realizations preferable to others
- one such property is *controllability*