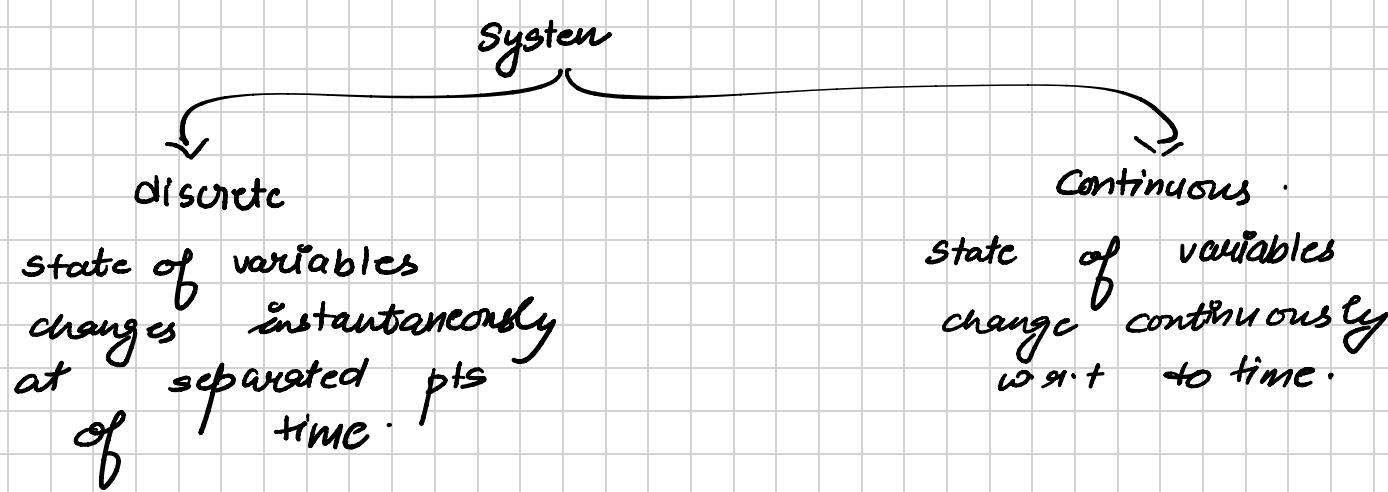



System is a collection of entities of people or machines that act or interact together towards the accomplishment of some logical end.

Collection of entities that comprise entire system in one study might only be a subset of another.

State of system is collection of variables required to describe a system relative to objectives of study at a particular time.



analytical solutions vs Simulation

If the model is simple then it may be possible to work with its relationships and quantities to get the exact analytical solution.

$$d = vt$$

distance is known
velocity also

we can get time

$$t = d/v$$

Some analytical solutions can become very complex requires vast computing.
→ inverting large matrix.

If analytical sol available and is computationally efficient can be used.

For complex - Simulation is used.

Static vs dynamic

A static simulation model is a representation of a model at a time or one that is used to represent a system in which time simply plays no role.

Dynamic evolves over time.

Deterministic and Stochastic

No random components → deterministic output is determined once set of input quantities and relationships in the model have been specified.

Stochastic simulation modes produce output that is random itself.

discrete vs continuous

Discrete event simulation concerns the modeling of a system as it evolves over time by representation in which the state variables change instantaneously at separate points in time.

Points are when event occurs.

instantaneous occurrence
state of system. ↗ that may change

Continuous - state variables change continuously over time.

continuous - differential eqs to give predictions for rates of change