

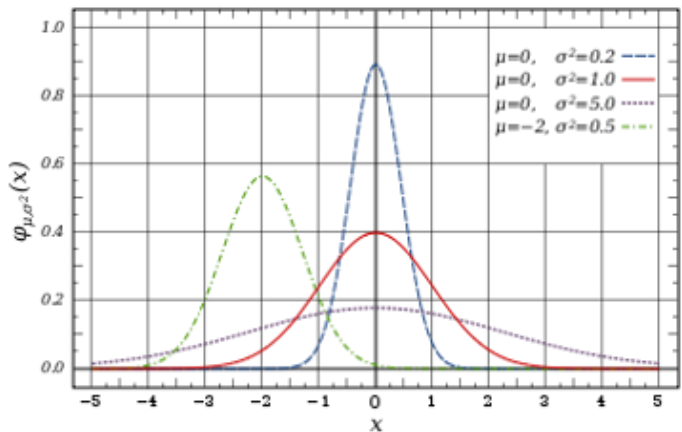
# CSCI 4210 OPERATING SYSTEMS

Probability Distributions  
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## NORMAL DISTRIBUTION

Also known as a Gaussian distribution, more frequently occurring events are clustered together to form a “bell curve”

Often a good representation or approximation of naturally occurring data (e.g., height, weight, exam grades, etc.)

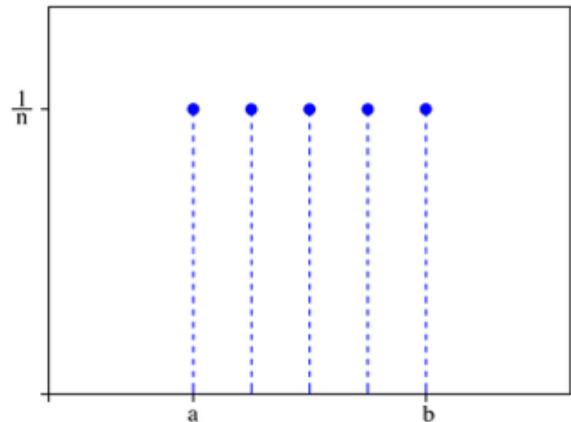


## UNIFORM DISTRIBUTION

Each event is equally likely

Pseudo-random number generators typically provide a sequence of values that fit a uniform distribution

Can be used to generate other distributions...



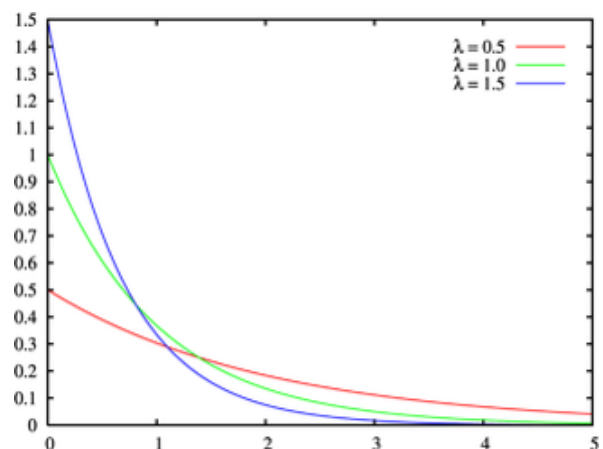
## EXPONENTIAL DISTRIBUTION

An exponential distribution describes the time between discrete events (e.g., inter-arrival times)

Events occur independently and continuously

We can model inter-arrival times with a constant average rate

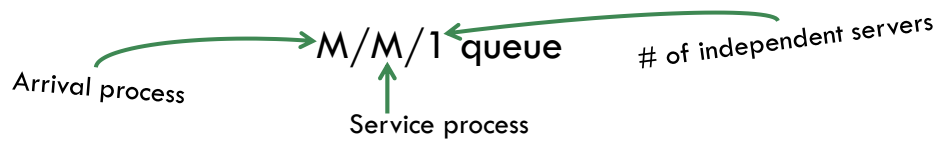
This model is a “memoryless” system



# QUEUEING SYSTEMS

A *queueing system* is completely described using three attributes:

- INPUT: how do “customers” (e.g., processes) arrive or join the system?
- QUEUE DISCIPLINE: how is the queue ordered (e.g., FCFS, SJF, etc.)?
- SERVICE MECHANISM: how many service points or servers (e.g., CPUs) are there?



- M: Memoryless (i.e., a Poisson arrival process with rate  $\lambda$ )
- D: Deterministic (i.e., inter-arrival interval is fixed and non-random)
- G: General