DAY 12: PROBABILITY DISTRIBUTIONS

TODO

PROBABILITY DISTRIBUTIONS

Random variables & their distributions

PROBABILITY DISTRIBUTIONS PROJECT

Work on Probability Distributions Exercises Project in Python (Random variables module), plan to finish before class Wednesday

DESCRIPTIVE STATS PROJECT

Submit Descriptive Statistics Exercises in Python Project (Descriptive Stats module), if you haven't already

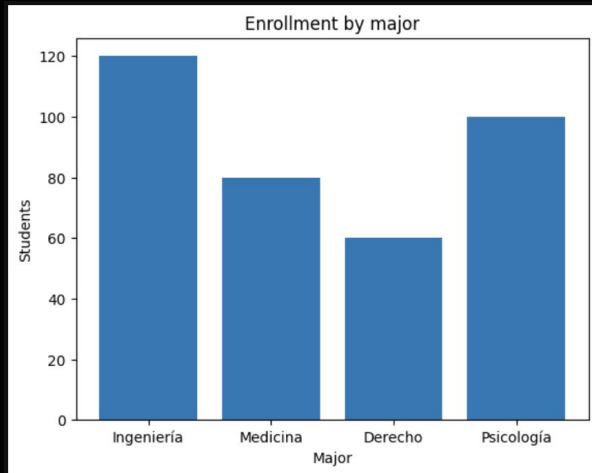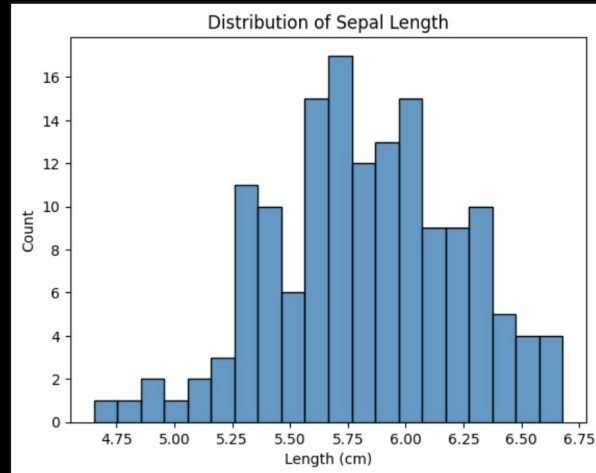# TOPICS

DISCRETE & CONTINUOUS RVs

WHAT
- Numerical representation of some event
- **Discrete random variable**: can be any one of a finite set of values (ex: day of week)
- **Continuous random variable:** can be any value in some interval (ex: current temperature)
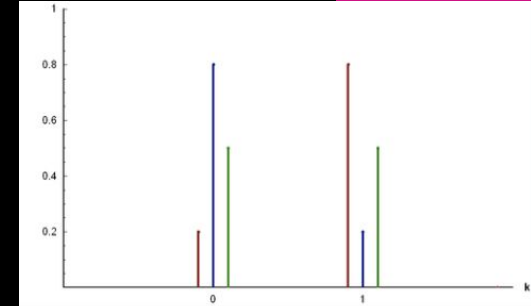
DISCRETE

Enrollment by major

CONTINUOUS

Distribution of Sepal Length

COMMON DISTRIBUTIONS

Three examples of Bernoulli distribution:

- $P(x = 0) = 0.2$ and $P(x = 1) = 0.8$
- $P(x = 0) = 0.8$ and $P(x = 1) = 0.2$
- $P(x = 0) = 0.5$ and $P(x = 1) = 0.5$

BERNOULLI

Distribution of a binary discrete random variable. Occurs when there are only two possible outcomes.

- $p=0.5$ and $n=20$
- $p=0.7$ and $n=20$
- $p=0.5$ and $n=40$

BINOMIAL

Probability distribution for n successes in sequence of Bernoulli trials
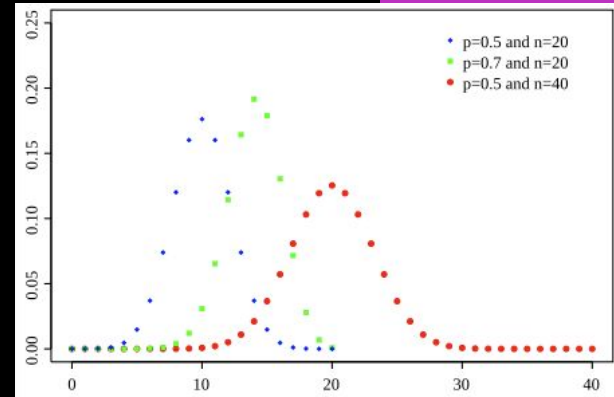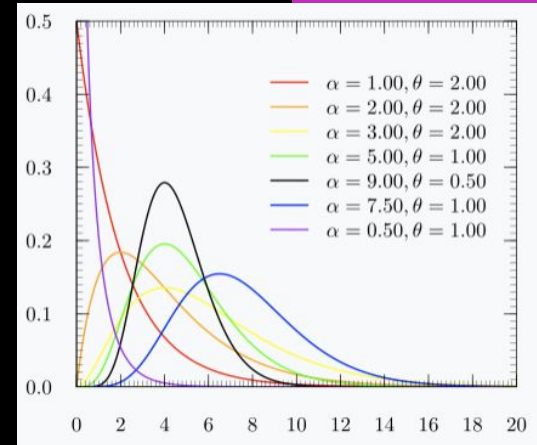
COMMON DISTRIBUTIONS

GAUSSIAN

Continuous distribution of real-valued random variable. Defined by mean and standard deviation. Often shows up in natural processes (people's height).
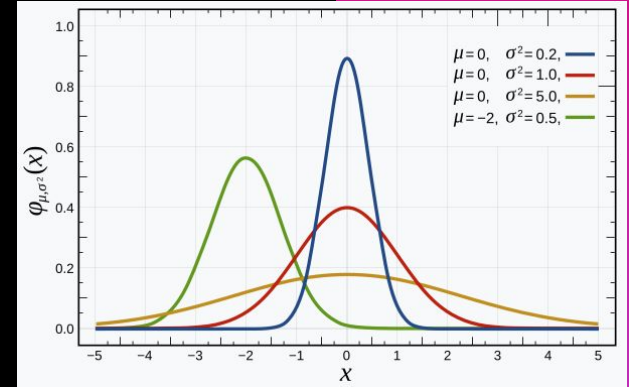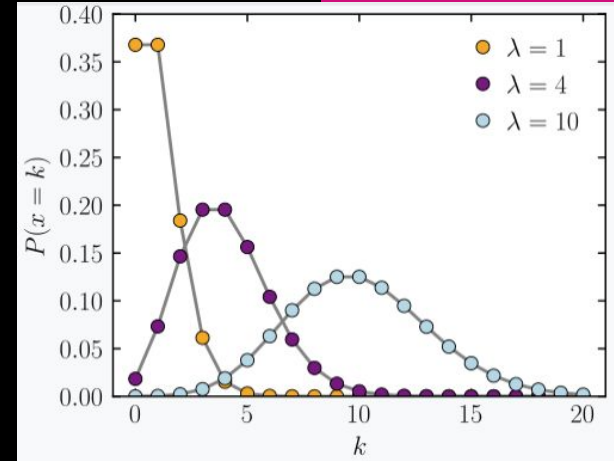

GAMMA

Another two parameter continuous probability distribution. Has special cases and applications in hypothesis testing

COMMON DISTRIBUTIONS

POISSON
Discrete distribution describing the number of events in some time interval.

STUDENT'S T
Generalization of normal distribution, used for Student's t-test of the difference in means.