LAB 06

PH142 Fall 2025

Announcements

- **Lab06:** due 10/10 at 11:59pm
- **Quiz05:** due 10/10 at 11:59pm
- **Group Project Part II:** due 10/24 at 11:59pm

*Your group must meet with your assigned GSI before the due date.

Week 7 Lecture Review

Distributions

- *Distributions* are used to model patterns in data
- We will cover three distributions:
  - Normal
  - Binomial
  - Poisson
- Based on what we know about the data's underlying distribution, we can calculate the mean, variance/SD, and probabilities

Week 7 Lecture Review

The Normal Distribution

The Normal distribution is a bell-shaped, symmetric distribution, with notation $\mathbf{X \sim N(\mu, \sigma)}$

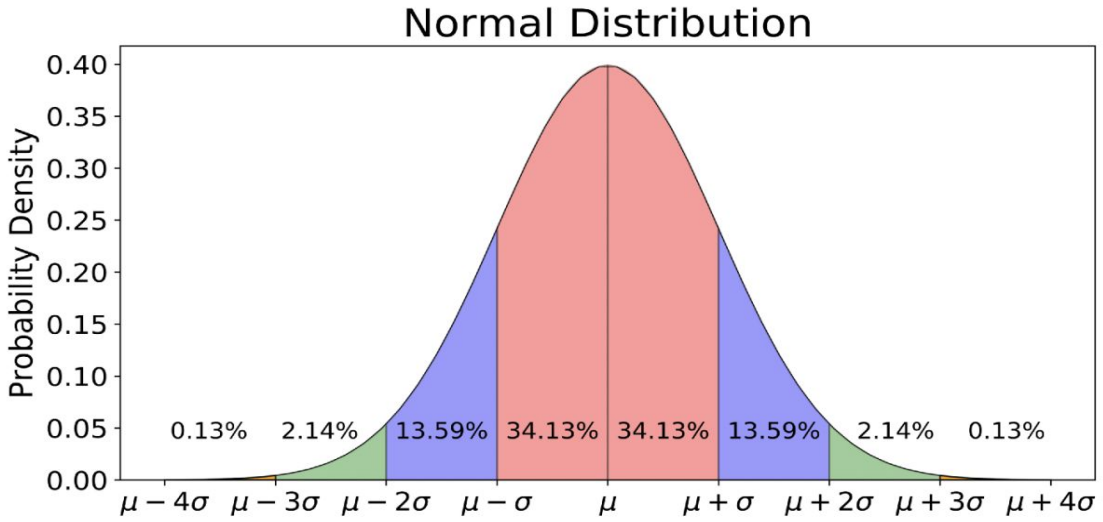
- μ = mean
- σ = standard deviation

R Functions:

- pnorm() → outputs the probability of value x or below
- rnorm() → generates random draws from the distribution
- qnorm() → outputs a quantile

Week 7 Lecture Review

The Normal Distribution



Week 7 Lecture Review

The Binomial Distribution

The Binomial distribution models discrete random variables (only whole numbers), with notation **X ~ Binom(*n*, *p*)**

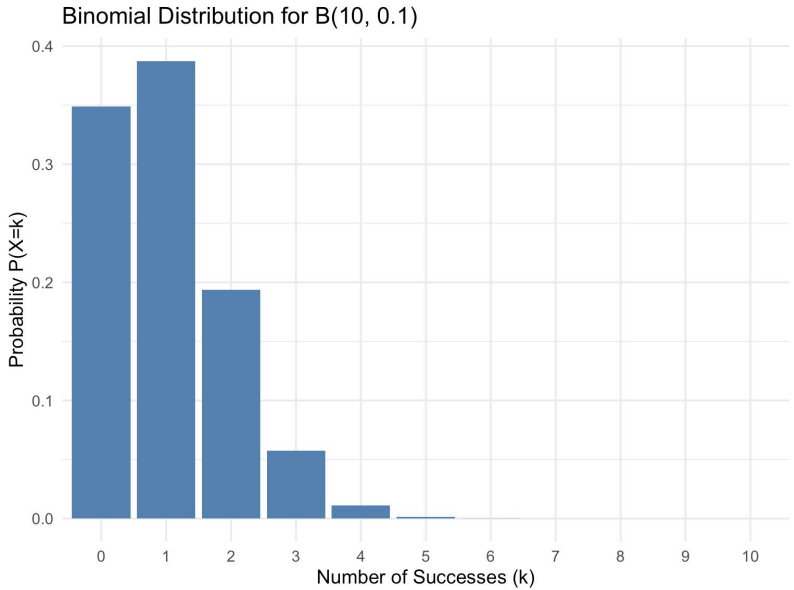
- *n* = total number of “trials”
- *p* = probability of success

R Functions:

- pbinom() → outputs the probability of value x or below
- dbinom() → outputs the probability of x successes exactly
- rbinom() → generates random draws from the distribution

Week 7 Lecture Review

The Binomial Distribution



Week 7 Lecture Review

The Poisson Distribution

A Poisson distribution describes the number of event occurrences in fixed, finite intervals of time or space, with notation **X ~ Pois(λ)**

- λ = the average number of events in an interval

R Functions:

- ppois() → outputs the probability of value x or below
- dpois() → outputs the probability of x events exactly
- rpois() → generates random draws from the distribution

LAB 06 Walkthrough

Lab Submission

- Follow the directions on the LAB06 file
- Submit using the **Terminal Tab** (next to the console in the bottom left pane)
  - Copy and paste the given line into the terminal
  - Follow prompts (NOTE: the terminal will **not** show your password being typed out!)
- **CHECK IN GRADESCOPE THAT ALL YOUR TESTS PASSED**