

# r\_stats repository readme

This repository contains homework and projects completed during my Statistics courses at UVA. A summary of each assignment is below:

## Homework 1:

- Calculate and interpret descriptive statistics
- Manipulate and plot datasets

## Homework 2:

- Manipulate and plot datasets

## Homework 3:

- Calculate and interpret confidence intervals
- Examine the relationship between confidence intervals and hypothesis tests

## Homework 4:

- Interpret results of different t-tests on the same dataset and determine which is most appropriate to use
- Determine appropriate transformations to use on datasets to facilitate statistical testing
- Follow all the steps of hypothesis testing and clearly state conclusions about the test assumptions to validate choice of test:
  - Use the `btg.csv` dataset to assess excretion of  $\beta$ -thromboglobulin in the urine of diabetic and non-diabetic mice

## Homework 5:

- Calculate effect size and sample size necessary to reach required power
- Follow all the steps of hypothesis testing and clearly state conclusions about the test assumptions to validate choice of test:
  - Use the `nhanes.csv` dataset to assess the difference in Testosterone values in adult males with health insurance versus those without
  - Use the `penguins` dataset from the `palmerpenguins` package to assess the difference in flipper length (`flipper_length_mm`) for Adelie and Chinstrap penguins

## Portfolio 1:

- Manipulate and visualize data to investigate the `measles.csv` dataset

## Portfolio 2:

- Manipulate and visualize data to investigate the `nurses.csv` dataset
- Linear regression and correlation tests

**Final:**

- Comparison of tumor volume of untreated glioma-bearing mice with combination-treated glioma bearing-mice at day 20 post-tumor implantation
- Manipulate, visualize, and perform statistical testing on dataset