**Exam 1 Study Guide**

**This exam covers *basic* descriptive statistics, probability, hypothesis testing, and Python (Pandas)**

**Descriptive Statistics:**

Be able to understand, interpret, and calculate (showing your work):

Measures of central tendency: Arithmetic mean, geometric mean, median, and mode.

Measures of dispersion: Variance and standard deviation

Measures of association: Covariance and correlation

Measures of range: Percentiles and quantiles

**Graphs, Charts, & Tables:**

Be able to interpret basic graphs, charts, and tables, particularly:

Histograms

Given a histogram, be able to identify if the data come from a uniform, normal, binomial, or poisson distribution.

Frequency tables

**Basic Probability:**

Know the basic notation for marginal probability and conditional probability

Understand independent and dependent events, mutual exclusivity, and complementary probability

Understand when and how to use the formulas for the rules below:

Addition rule

Example: What is the probability of rolling a six or getting a heads if you roll dice and flip a coin?

Multiplication rule

Example: What is the probability it will rain and it’s a Tuesday?

**Probability Distributions:**

[**Link to practice problems**](https://github.com/rjwrobel86/Python4Statistics/tree/main/Non-Python%20Stats%20Stuff)

Normal Distribution Problems:

Given a mean, standard deviation, and Z table, be able to calculate:

Z for any value

p(x>X)

p(x<X)

p(XL<x<XH)

Binomial and Poisson Distribution Problems:

p(x=X)

p(x<X)

p(x<=X)

p(x>X)

p(x>=X)

**Hypothesis Testing:**

Be prepared to conduct hypothesis tests using the Z and T distributions

Know the difference between left, right, and two tailed tests

Know the difference between single sample and two sample tests

Know the difference between testing for means and for proportions

Know the decision rules

Know when to use Z vs T

Types of tests on the test: Single Sample Z, Single Sample T, Two Sample Z, One Proportion Z

**Python / Pandas**

Know how to create and/or identify:

Comments

Variables

For loops

Lists

Functions

Know the commands in the Pandas notebook / assignment well enough to annotate some sample code. I’ll present you with some code and you’ll need to write what you think the code does.