Statistics Syllabus – Carnegie Mellon University

Week 1: Descriptive Statistics

What is statistics?

Types of data

Random sampling

Histograms

Measures of central tendency

Measures of variability

Box plots

Week 2: Probability

Basic probability

Conditional probability

Bayes' Theorem

Week 3: Random Variables

Discrete random variables

Continuous random variables

The Uniform distribution

The Normal distribution

Central Limit Theorem

Week 4: Confidence Intervals

Large-sample confidence intervals for the mean

Small-sample confidence intervals for the mean

Large-sample confidence intervals for the population proportion

Determining the sample size

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Week 5: Hypothesis Testing

Introduction to hypothesis testing

Large-sample hypothesis tests for the mean

p-values

Small-sample hypothesis tests for the mean

Large-sample hypothesis tests for the population proportion

Comparing two population means

Comparing two population proportions

Week 6: Simple Regression

Linear models

Least squares linear regression

Estimating the error of the model

Making inferences using the model

Coefficients of correlation and determination

Week 7: Multiple Regression

Multivariate linear models

Least squares linear regression

Estimating the error of the model

Multiple coefficient of determination