ECON 3790
Spring 2010

Review – Final Exam (May 06: 18:00 – 20:00)

Chapter 1: Data and Statistics
1.1 Scales of measurement; qualitative and quantitative data
1.2 Descriptive statistics vs. inferential statistics

Chapter 2: Descriptive Statistics
2.1 Frequency distribution; relative frequency distribution
   How to determine the number of classes, width of the classes, and class limits
2.2 Qualitative vs. quantitative data in descriptive statistics

Chapter 3: Numerical measures
3.1 Measures of location: mean, median, mode, percentile
3.2 Measures of variability: range, variance, standard deviation, coefficient of variation
3.3 Distribution shape and relative location: skewness, z-score, Chebyshev’s theorem, empirical rule
3.4: Covariance and correlation coefficient

Chapter 4: Probability
4.1 Counting rules: multiple-step experiment, combination, and permutation
4.2 Rules of probability: complement rule and addition rule
4.3 Conditional probability, independent events and multiplication law

Chapter 5: Discrete probability distribution
5.1 Random variable, probability function, criteria for a valid probability distribution
5.2 Expected value and variance
5.3 Binomial probability distribution

Chapter 6: Continuous probability distribution
6.1 Uniform probability distribution
6.2 Normal distribution
   standard normal distribution; how to compute probabilities for any normal distribution

Chapter 7: Sampling distribution
7.1 Sampling distribution for \( \bar{x} \): \( E(\bar{x}) \) and \( \sigma_{\bar{x}} \); central limit theorem
7.2 Sampling distribution for \( \bar{p} \): \( E(\bar{p}) \) and \( \sigma_{\bar{p}} \)

Chapter 8: Interval estimation
8.1 Margin of error and interval estimate
8.2: Population mean interval estimate: \( \sigma \) known vs. \( \sigma \) unknown
Chapter 9: Hypothesis testing
9.1 Developing null and alternative hypotheses
9.2 Type I and type II errors
9.3 Hypothesis testing for population mean: $\sigma$ known vs. $\sigma$ unknown
   One-tailed and two-tailed tests

Chapter 10: Two population means hypothesis testing
   Test the difference between two population means: $\sigma_1$ and $\sigma_2$ are known

Chapter 12: Tests of goodness of fit and independence
12.1 Goodness of fit test: a multinomial population, $\chi^2$ test
12.2 Test of independence: $\chi^2$ test

Chapter 13: ANOVA
13.1 Assumptions for ANOVA
13.2 Between-treatments estimate of population variance and within-treatments estimate of population variance
13.3 $F$ test and ANOVA table

Chapter 14: Simple linear regression
14.1 Simple linear regression model
14.2 Calculate $b_0$ and $b_1$
14.3 Coefficient of determination
14.4 Model assumptions
14.5 Testing for significance: estimate of $\sigma^2$, t test, and $F$ test
14.6 Regression output table including ANOVA table

Chapter 15: Multiple regression
15.1 Multiple regression model
15.2 Testing overall significance and individual significance
15.3 Regression output table including ANOVA table
15.4 Multiple regression with a dummy variable