FAST National University of Computer and Emerging Sciences
Spring 2023
MT-2005 Probability and Statistics

Course Content for Final Exam

Contents/Topics
Measures of the center of data: **Use of standard deviation:** (Chebyshev's theorem, Empirical Rule) **Measure of position:** (Quartiles and Interquartile Range, Percentiles and Percentile Rank) **Box-and-Whisker plot.**
Bayes's Formula and Total probability **Probability distribution of discrete random variable**, its Joint Probability Distribution, marginal distribution, Mean & Variance, Covariance, and Correlation.
Types of Continuous Probability distribution: Normal probability distribution Standardizing a Normal Distribution Application of the Normal Distribution Determining the z and x values when an area under the Normal distribution curve is known.
Estimation: Introduction, Types of estimation, confidence interval for mean with specific α (with σ known), finding sample size, confidence interval for mean with specific α (with σ unknown)
Hypothesis Testing: Introduction, three ways for hypothesis testing, types of decision, one sample *z*-test for mean, test for difference between two means, *t*-test for a mean, Testing difference between two means when $\sigma_1 \neq \sigma_2$ (independent set-unpooled *t*-test) Testing difference between two means when $\sigma_1 = \sigma_2$ (independent set-pooled *t*-test) Testing difference between two means (dependent samples)
Regression & Correlation: Scattered plot/diagram. Correlation coefficient, Introduction to simple linear regression, Relationship between correlation and regression, determining regression equation (the least square method), coefficient of determination, Inferences in correlation coefficient. The simple linear regression model.
Analysis of variance: Introduction to ANOVA , F-test, one-way ANOVA