

Curriculum in Statistics

Text 1

Applicants are required to write at least four brief essays on the following topics

1. Definition and properties of an estimator.
2. Prediction intervals for linear regression models.
3. Derive location indexes by decision theoretic considerations.
4. Generalized linear models (GLMs). Briefly describe characteristics and empirical implications of this class of statistical models.
5. Briefly illustrate residual diagnostic methods in regression models.
6. Describe the method of principal component analysis.
7. The relevance of randomization in sampling procedures.
8. The role of exchangeability in Bayesian inference.
9. Definition and use of concentration indexes.
10. Poisson distribution for discrete data and the log-linear model.

Curriculum in Statistics

Text 2

Applicants are required to write at least four brief essays on the following topics

1. Discuss and compare the method of moments and the maximum likelihood method for parameter estimation.
2. - Bootstrap methods in statistical inference.
3. Definition and interpretation of the p-values
4. Definition and use of some indexes of variability
5. Multivariate Normal distribution: main properties
6. Chi-squared test to study the association between qualitative variables.
7. The Neyman-Pearson approach to test two simple hypotheses.
8. Not informative priors for the mean and the variance of observations modelled by the Gaussian model.
9. Compare confidence intervals and Highest posterior density intervals (HPD).
10. The role of conditional independence in Statistics.

Curriculum in Statistics

Text 3

Applicants are required to write at least three brief essays on the following topics

1. Estimation of parameters for the linear regression model with normal errors.
2. Define and compare the methods of ordinary least squares and maximum likelihood for parameter estimation.
3. Analysis of two-way contingency tables.
4. The correlation coefficient to study the association between quantitative variables
5. Key issues for Regression diagnostics
6. Relationship between confidence intervals and test of hypotheses
7. Briefly introduce regression models for binary outcomes
8. Definition and usefulness of conditional statistical independence
9. The use of the marginal likelihood for model selection
10. Conjugate families of distributions in Bayesian inference