Summary of Functions

Summary of Functions: Introduction to Bayesian

Introduction to Bayesian Thinking

`pdisc` – computes the posterior distribution for a proportion for a discrete prior distribution

Usage: `pdisc(p, prior, data)`

Arguments: `p`, a vector of proportion values; `prior`, a vector of prior probabilities; `data`, a vector consisting of the number of successes and number of failures

Value: the vector of posterior probabilities

Introduction to Bayesian Thinking

`discint` – computes a highest probability interval for a discrete distribution
Usage: `discint(dist,prob)`
Arguments: `dist`, a probability distribution written as a matrix, where the first column contains the values and the second column contains the probabilities; `prob`, the probability content of interest
Value: `prob`, the exact probability content of the interval, and `set`, the set of values of the probability interval

Introduction to Bayesian Thinking

`beta.select` – finds the shape parameters of a beta density that matches knowledge of two quantiles of the distribution

Usage: `beta.select(quantile1,quantile2)`

Arguments: `quantile1`, list with components `p`, the value of the first probability, and `x`, the value of the first quantile; `quantile2`, list with components `p`, the value of the second probability, and `x`, the value of the second quantile

Value: vector of shape parameters of the matching beta distribution

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`histprior` – computes the density of a probability distribution defined on a set of equal-width intervals

Usage: `histprior(p,midpts,prob)`

Arguments: `p`, the vector of values for which the density is to be computed; `midpts`, the vector of midpoints of the intervals; `prob`, the vector of probabilities of the intervals

Value: vector of values of the probability density

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`pbetap` – computes the predictive distribution for the number of successes of a future binomial experiment with a beta distribution for the proportion
Usage: `pbetap(ab, n, s)`
Arguments: `ab`, the vector of parameters of the beta prior; `n`, the size of the future binomial sample; `s`, the vector of the numbers of successes for a future binomial experiment
Value: the vector of predictive probabilities for the values in the vector `s`

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`pdiscp` – computes the predictive distribution for the number of successes of a future binomial experiment with a discrete distribution for the proportion
Usage: `pdiscp(p, probs, n, s)`
Arguments: `p`, the vector of proportion values; `probs`, the vector of probabilities; `n`, the size of the future binomial sample; `s`, the vector of the numbers of successes for a future binomial experiment
Value: the vector of predictive probabilities for the values in the vector `s`

Summary of Functions: Single Parameter Models

Single-Parameter Models

`normal.select` – finds the mean and standard deviation of a normal density that matches knowledge of two quantiles of the distribution

Usage: `normal.select(quantile1,quantile2)`

Arguments: `quantile1`, list with components `p`, the value of the first probability, and `x`, the value of the first quantile; `quantile2`, list with components `p`, the value of the second probability, and `x`, the value of the second quantile

Value: `mean`, mean of the matching normal distribution; `sigma`, standard deviation of the matching normal distribution

Single-Parameter Models

`binomial.beta.mix` – computes the parameters and mixing probabilities for a binomial sampling problem where the prior is a discrete mixture of beta densities

Usage: `binomial.beta.mix(probs,betapar,data)`

Arguments: `probs`, vector of probabilities of the beta components of the prior; `betapar`, matrix where each row contains the shape parameters for a beta component of the prior; `data`, vector of number of successes and number of failures

Value: `probs`, vector of probabilities of the beta components of the posterior; `betapar`, matrix where each row contains the shape parameters for a beta component of the posterior

Single-Parameter Models

`pbetat` – Bayesian test that a proportion is equal to a specified prior using a beta prior

Usage: `pbetat(p0,prob,ab,data)`

Arguments: `p0`, the value of the proportion to be tested; `prob`, the prior probability of the hypothesis; `ab`, the vector of parameter values of the beta prior under the alternative hypothesis; `data`, vector containing the number of successes and number of failures

Value: `bf`, the Bayes factor in support of the null hypothesis; `post`, the posterior probability of the null hypothesis