Course Overview

This is only a rough overview of the topics that we plan to cover in the class.

Week 1 (April 3 and 5)

- ❏ Dotplot, histogram, time-series plot
- ❏ Mean, median, sample variance, sample correlation
- ❏ The empirical rule
- ❏ Linear function, mean and variance of a linear function
- ❏ Linear combinations, portfolios

Week 2 (April 10 and 12)

- ❏ Modelling uncertainty, random variables
- ❏ Bernoulli distribution
- ❏ Joint model for multiple random variables, conditional and marginal distribution
- ❏ Independence, IID model, Markov model
- ❏ Binomial distribution
- ❏ Random walk

Week 3 (April 17 and 19)

- ❏ Probability distribution function (pdf), cumulative distribution function (cdf)
- ❏ Normal family of distributions, standard normal distribution
- ❏ Inverse cdf
- ❏ Standardization

Week 4 (April 24 and 26)

- ❏ Expected value and variance
- ❏ Conditional expected Value
- ❏ Model vs. sample means and variances
- ❏ Formulas for means and variances
- ❏ Covariance and correlation for random variables
- ❏ Central limit theorem (clt)

Week 5 (May 1 and 3)

- ❏ Estimating a normal mean, distribution of a normal sample mean
- ❏ Confidence intervals for normal data
- ❏ Confidence interval for p from Bernoulli data
- ❏ Approximate confidence intervals based on clt

Week 6 (May 8 and 10)

- ❏ Midterm
  - ❏ Includes topics from Lecture 1 - 4 and part of Lecture 5
  - ❏ Bring one sheet of paper

Week 7 (May 15 and 17)

- ❏ hypothesis tests for mean of Bernoulli and normal random variable
- ❏ P-values
- ❏ Confidence intervals and hypothesis tests

Week 8 (May 22 and 24)

- ❏ Introduction to the regression model
- ❏ Prediction, fitted values and residuals
- ❏ Least squares criterion
- ❏ R-squared

Week 9 (May 29 and 31)

- ❏ Simple linear regression model
- ❏ Predictive intervals
- ❏ Sampling distribution of the regression model and confidence intervals
- ❏ Hypothesis testing

Week 10 (June 5 and 7)

- ❏ Multiple regression model
- ❏ Fitted values and residuals revisited
- ❏ Prediction, confidence intervals and hypothesis testing

Week 11 (June 12 and 14)

- ❏ Final exam
  - ❏ Includes all topics
  - ❏ Bring two sheets of paper