Homework 1 MATH 181B Fall 2019

Due October 7th 5 PM PST

Content: This homework includes review of Math 181A material, problems from Section 10.2 and R simulation.

- **Problem 1** Larsen and Marx page 289 Problem 5.2.14.

- **Problem 2** Larsen and Marx page 289 Problem 5.2.16.

- **Problem 3** Larsen and Marx page 374 Problem 6.4.18.

- **Problem 4** Larsen and Marx page 399, Problem 7.4.20

- **Problem 5** Larsen and Marx page 488, Problem 10.2.4

- **R simulation** The uploaded R code `test_binomial.R` generates values from the binomial distribution using the built-in R function and also by a sampling strategy which uses a uniformly distributed random variable. Setup a similar code for generating values from a multinomial distribution whose parameters are given by $n=10$ and $p=(0.2, 0.3, 0.5)$. Estimate the following:
– Mean, variance and covariances for all variables using samples generated by the R-built function

– Mean, variance and covariances for all variables using samples generated by the sampling method

– Compare these versus the theoretically obtained values

– Explain why all covariance values obtained are negative

You must submit your R code with your solution for this problem.