Advanced Statistics - Lab 08

1) Confirm or disprove by simulations the bound in expression (16) in "Lecture 08: Finite Sample PCA I". It is up to you which covariance matrix Σ you should use to generate the outcomes of the random vectors with which you then build $\hat{\Sigma}$ and $\boldsymbol{P}_{\hat{\Sigma}}$.

Upload the results on Moodle in a single PDF file or as the script itself that contains explanations, the code, and figures.

Important note: By failing to do the following, you will loose points:

- You must provide clear explanation of what your program is doing.
- Use a log-scale when plotting probabilities or tails.
- You must provide comments in your code in order for anyone to understand the code.
- You must not use in-build functions for obtaining the PDF, mean, variance, and probability.
- You must use different colors, lines, and markers in the plots, along with legends for each curve and suitable line-widths of the curves so that the figure is understandable.
- You must clearly define what are the x and y axis in your figures.
- Finally, you must use caption that fully explains the figure.