Applied Financial Statistics
(FINA 362)

Quiz 1

Name – Surname: ....................................................                 Student No: .....................

Questions:

1. What are the characteristics of normal distributions? Do the followings follow normal or skewed (to the right or to the left) distributions and why? (20 pts)

   a. Mean: 3.5, Mode: 3.5, Median: 3.5
      This follows normal distribution since mean, median and mode are the same.

   b. Mean: 3.5, Mode: 3.0, Median: 3.2
      This distribution is skewed to the right since Mean > Median > Mode

   c. Mean: 3.5, Mode: 3.7, Median: 3.6
      This distribution is skewed to the left since Mean < Median < Mode

   d. Mean: 3.5, Mode: 3.6, Median: 3.7
      This distribution is UNCLEAR.

2. Differentiate between z-test and t-test in hypothesis testing? When do we use z-test and t-test in hypothesis testing? Explain very shortly! (20 pts)

   z-test is used when population standard deviation and population mean are known and number of observations are at least 30.

   t-test is used when population standard deviation and population mean are unknown and number of observations are less than 30.
3. You are given the following information about annual IBM stock returns:

\[ H_0: \mu < 5.6\% \]
\[ H_1: \mu = 5.6\% \]

\[ n = 35 \text{ years} \]
\[ t = 1.97 \quad (t\text{-prob: 0.056}) \]

Please answer the following questions based on the above information (60 pts):

a. Explain the null and the alternative hypotheses very briefly! What do the null and the alternative hypotheses suggest for IBM?

The null hypothesis above suggest that average IBM stock returns are less than 5.6\% per annum.

The alternative hypothesis above suggest that average IBM stock returns are at least 5.6\% per annum.

b. Having t-test information, do you accept or reject your hypothesis? At what level and why?

Since t-critical value is NOT given for the above example, we will look at t-prob value for our decision.

\[ t\text{-prob: 0.056} \] is greater than alpha 0.01 and 0.05 levels, but less than 0.10 level. So, we cannot reject our hypothesis at \( \alpha = 0.01 \) and \( \alpha = 0.05 \) levels, but we can reject it at \( \alpha = 0.10 \) level. Thus, the null hypothesis (H0) is rejected and the alternative hypothesis is accepted only at \( \alpha = 0.10 \) level of error.

c. Make your interpretation on your decision. What do you mean by accepting (or rejecting) the above hypothesis?

We reject our null hypothesis and accept our alternative hypothesis at \( \alpha = 0.10 \) level that average IBM stock returns will be at least 5.6\% per year.