**Hypothesis test**

1. Form a one-sample t-test to check whether the sample data has the expected mean value.
   1. You may use rnorm to generate some data with known mean
   2. Then test whether the data has the right mean (test 1)
   3. Test again using a different mean
   4. Explain what are the six steps during the course. Note that some of the answers need to write new R code, instead of just reading from the outcome.
      1. H0 v.s. H1?
      2. How risky we are? (the type I error)
      3. Which test statistic?
      4. The critical value?
      5. The statistic?
      6. The P-value?
   5. Change the sample size to see how p-values change accordingly
   6. Change the variance (sd) to see how p-values change accordingly

**The following assignments will be graded.**

1. Implement a permutation test to test whether the mean of the random numbers is the same to an expected value (similar to what you have done using the t-test above). Compare the P-value out of permutations and the P-value out of t-test. Note that, although coding by yourself is preferable, it is Ok if you manage to utilize a package. However, you need to correctly interpret what the package is doing. Please also tell me which library to be installed for me to run your code.