1. Use `rnt.csv` data collected in class. Write a function in R called `chisquarefit` to perform the chi-square goodness of fit test to decide if the numbers drawn from the table were truly random.
2. From the Talent experiment data:
   (a) Use `firstsuccess.csv` data collected in class from the talent experiment. This file contains the data on the trial at which the first success was obtained. Write a function `mlefs` to compute the likelihood function for the probability of success. Then using the inbuilt `optim` function find the m.l.e for the probability of success.
   (b) Use `numsuccess.csv` data collected in class from the talent experiment. This file contains the data on the number of successes in 10 trials. Write a function `mlens` to compute the likelihood function for the probability of success. Then using the inbuilt `optim` function find the m.l.e for the probability of success.
   (c) Can you perform a test whether your groups Probability of success is the same as the Probability of success for the class ?
3. Using `read.table` read `bootdata.csv` in the shared dropbox folder and assign it to variable `x`.
   (a) Write a function in R called `coefvar` which computes for a vector x,
   $$\text{coefficient of variation} = \frac{\text{Standard Deviation}(x)}{\text{mean}(x)}.$$
   (b) Write a simple function called `bootx` which will generate 1000 samples form x of the same length and for each sample compute its coefficient of variation and assign as `bootcoefvar[i]` for each i between 1 and 1000.
   (c) Find the `mean(bootcoefvar)`, `Var(bootcoefvar)`, and plot its histogram.
   (d) Using the quantiles at 97.5% and 2.5% provide a confidence interval for the coefficient of variation of `x`.
4. Using `read.table` read `gammadata.csv` in the shared dropbox folder and assign it to variable `x`.
   (a) Write a function in R called `coefvar` which computes for the vector x,
   $$\hat{\alpha} = \frac{(\text{mean}(x))^2}{\text{Var}(x)}.$$
   (b) Write a simple function called `bootalphax` which will generate 1000 samples form x of the same length and for each sample compute its $\hat{\alpha}$ and assign as `bootalphahat[i]` for each i between 1 and 1000.
   (c) Find the `mean(bootalphahat)`, `Var(bootalphahat)`, and plot its histogram.
   (d) Using the quantiles at 97.5% and 2.5% provide a confidence interval for the coefficient of variation of `x`.