1. Consider the problem of estimating the proportion of people who regularly

smoke. We hypothesize that the population proportion is 0.2. Suppose now that we

interview 150 people and find that 27 of them smoke regularly. Would you say the 0.2 is a plausible value? Use α = 0.1 and 0.05.

1. Run in R this command

t.test(Theoph[,5], mu=15)

The data contain theophylline concentration in the sample (mg/L) (based on an experiment on the pharmacokinetics of theophylline). The output in R gives you a 95% confidence interval. What can you say about the true mean concentration of theophylline? How much should α be so that you do not reject this null hypothesis?

1. Type chem and you see some data. Now type t.test(chem, mu = 0). Report the 95% confidence interval for the mean copper concentration? Which values of μ0 do we have to put in the t.test so that the null hypothesis μ = μ0 is not rejected?
2. Run this in R.

library(MASS)

attach(birthwt)

t.test(bwt[ht==1], bwt[ht==0])

You already did this t.test. Repeat this using a permutation based t-test with 999 and 9999 permutations. What are your conclusions?

1. deaths

x1=deaths[1:36]

x2 = deaths[37:72]

t.test(x1, x2)

You already did this t.test. Repeat this using a permutation based t-test with 999 and 9999 permutations. What are your conclusions?

1. Do the following steps.
2. Generate x from an exponential distribution with n = 10 and rate 1.
3. Generate y from a normal distribution with mean 1 and variance 25.
4. Perform a t.test with equal variance, unequal variances and a permutation t-test. In all three cases store the relevant p-values.
5. Repeat steps (a)-(c) 1000 times and compute the proportion of times the p-values were less than 0.05.
6. Repeat steps (a-d) for n=20, 30, 40, 50 and 60.

Give me the 6 proportions for each sample size and each test. Also, give me the 6 histograms of the 1000 p-values for each testing testing procedure.