Statistics R Programming Class

Assignment 3 Due: Thursday, February 13

200 points

Problem 1: Write a function that returns a vector of all primes less than a specified integer n.

The function prototype is: prime.list <- function(n)

You MUST use the name prime.list for your function, and it must have one argument, which is a positive integer greater than 1. Check that the argument actually is a positive integer greater than 1. Also check that n does not exceed an upper limit. For purposes of this program you may set the upper limit to 10,000. You may use a higher upper limit if you desire, but the upper limit cannot exceed .Machine$integer.max

If there is an error in the argument, print an error message and stop.

Example: prime.list(10) returns the vector(2,3,5,7)

Problem 2: Write a function that returns the prime factorization of a positive integer in the range 2 to 1,000,000. The function prototype is int.factor(n)

You may wish to call the prime.list function within the int.factor function. Return the prime factors as the first row of a matrix and the powers as the second row in the matrix. You can use the rbind() function to create a matrix from vectors.

Again, use the prescribed name and perform error checking.

Problem 3: Write a function to determine if a point is inside a triange.

The function prototype is inside.triange <-function(t,p)

t is a 3x2 matrix containing the points that form the triangle, and p is a vector of length 2. If p is contained in the triangle (or on one of the sides of the triangle) then return TRUE. Otherwise return FALSE.

I will run your code on test benches I write. If you do not follow the prescribed names, your code will fail on my test bench. I will not change the test bench to fit any name you might use. A large part of the grade depends on passing the test bench.

As usual, email me one R file containing all your functions. Use the naming convention for your file that we have used before. Do NOT find some R package that will solve these problems. Write your own code.