ES 314 Advanced Programming, Modeling and Simulation Fall 2012

Home Work # 2

Due: September 26, 2012

Your program should work on all inputs as required by the problem, not just the test examples provided. Instructions for submission will be provided in class.

1) Write a loop-free code segment in Matlab that tests if all the numbers in a given list are distinct. (Should evaluate to 1 or true if all the numbers of distinct, false or 0 otherwise.) For example, the list [1, 12, 7, 9, 13, 6, 7, 4] ([9, 8, 7, 2, 12, 10]) should generate no (yes) answer.

   First use sort function to sort the list.

2) Exercise 4.6

3) A straightforward, but not very efficient, way to approximate π is to generate two vectors of random numbers, x and y, using the **rand** function, which creates random numbers with a uniform distribution from 0 to 1. Then the approximation to π is 4 times the proportion of the indices j (relative to its size) such that that $x(j)^2 + y(j)^2 <= 1$. Write a code segment in Matlab (preferably without loops) to compute a good approximation to π. Choose the vectors to be of length 10000.

4) Write a script that creates an image containing an 8 by 8 checkerboard containing alternating squares of Red and Black color. The overall size of the image should be 256 by 256 pixels. See the figure below: