Math 3001: Scientific Computation

Fitchburg State University
Department of Mathematics
Quiz #4

December 8, 2016

Please write up the solutions to the following questions in julia via Jupyter or Julia Box. You may use the class notes and any old homeworks while answering the questions. You should put your name, date and quiz number at the top of the document and each question should be clearly labelled. If an explanation is asked, make sure that your answers are in complete sentences. When finished upload the .ipynb file to Blackboard.

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1. IMDB.com is the Internet Movie Data Base and has a number of facts about nearly every movie ever made. It also makes all of its data freely available. (See http://www.imdb.com/interfaces). The data on the site is in tons of different files and is quite a mess, but there is a nice set of scripts from https://github.com/hadley/data-movies. However, I couldn't quite get that to work, so used an established dataset created using this method and is attached to this quiz called `movies.csv`

   (a) Load the file in and double check that all of the columns have the correct type. If they don't reread in the file and force the type.

   (b) Find the top rated movie(s) and year(s) that it came out. If there is a tie for first, list all movies.

   (c) Create a Dataframe with only movies with more than 10000 votes. Find the top 5 rated movies(s) and year(s) of these movie.

   (d) Create another dataframe that consists of only movies from the 1980s. Find the number of movies with a rating of 9.0 or better.

   (e) What was the longest movie (in running time) in the 1980s.

   (f) Split the movies of the 1980s into individual years. Combine the result by average rating. In the end, you should have a table of size 10 with only the year and average rating.

2. Adapt your `Geometry` module from Homeworks #5 and #6. (you can make a copy of that module).

   (a) Add another type called `Triangle` that has three points.

   (b) Write a function called `is_equilateral` that takes a `Triangle` as an input and determines if the input is an equilateral triangle.

   (c) Write a function called `is_right` that takes a `Triangle` as an input and determines if the input is a right triangle. (Hint: recall Pythagoras' Theorem.)

   (d) There is a file called `test-triangle.jl` on Blackboard. Run it as is to test these functions.