
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.

1. Create a simulation of rolling 4 dice. The simulation should have 1 million rolls.
 - (a) Find the fraction of all rolls whose sum is less than 10.
 - (b) Find the fraction of all rolls whose sum is exactly 14.
 - (c) Find the fraction of all rolls with each individual die a odd number. For example 1,1,3,5 or 1,3,3,3.
2. Create a type `Quadratic` that mimics a quadratic function. The fields should be just numbers with names a, b, c for the coefficients of the x^2 , x and constant terms.
 - (a) Create a module called `Quad` that contains the following:
 - i. A `Quadratic` type as described above.
 - ii. An `add` function that takes two quadratics and returns the sum. Use `+` as the name of the function.
 - iii. A `subtract` function that takes two quadratics and returns the difference. Use `-` as the name of the function.
 - iv. A `roots` function that returns the roots of the quadratic function and make sure you return both roots. Use the quadratic formula for this and only deal with cases of real roots.
 - v. An `isequal` function that tests if two quadratics are equal.Note: for everything to properly work, you will need to import `Base.isequal`, `Base.+`, `Base.-`. Put the module in a separate file called `Quad.jl`.
 - (b) Download the file `test-quadratic.jl` from Blackboard and run it. You should not change the file and if all is well, you will get all tests pass.
3. In this problem, you will load in a JSON file and perform some calculations.
 - (a) Load and parse the file `bigmenu.json` from Blackboard.
 - (b) Write a function called `total_cost` that takes a dictionary (associative array) with that corresponds to the item name and number of items. The function should return the total cost of the items on the menu.
 - (c) Call your function on a meal of 2 hamburgers, a Caesar Salad, a soda, an orange juice, pumpkin pie and chocolate cake.