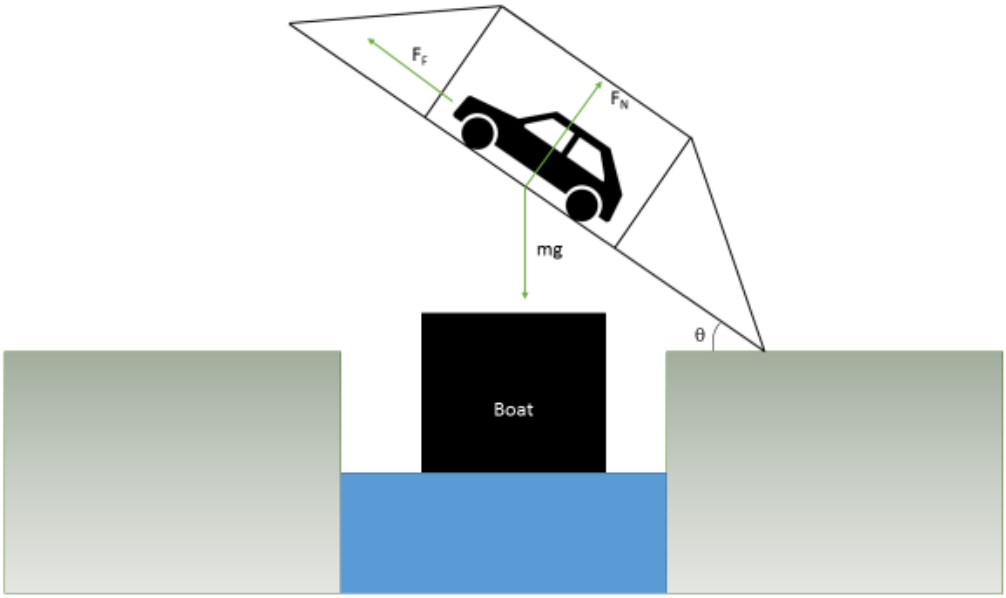
Recitation Assignment #8

Please do the following problems during your recitation session, including any additional problems given to you by your TA. Within 72hrs of your recitation session, you must upload the complete solutions to these problems to Sakai, so that your TAs can evaluate them in a timely fashion. **Please submit any .m files to Sakai. Your .m files should be named in the following format: NETIDRecitation8Problem#, where NETID is your NetID, and # is the problem number. For instance if your NetID was aaa111, and you were answering problem 3, your .m file would be named aaa111Recitation8Problem3.m. All of your .m files should be in the form of a function. If you do not meet these naming requirements, and do not save as a function, you will not receive credit for your submission.** Collaborative problems can be worked on in teams of up to 5 people, as long as each team member individually completes the problem uploads the solution as part of their own Sakai submission or shows the solution to their instructor individually, and lists the names of all collaborators in the Sakai submission. Collaboration and discussion of solutions is not permitted for questions labeled as individual problems.

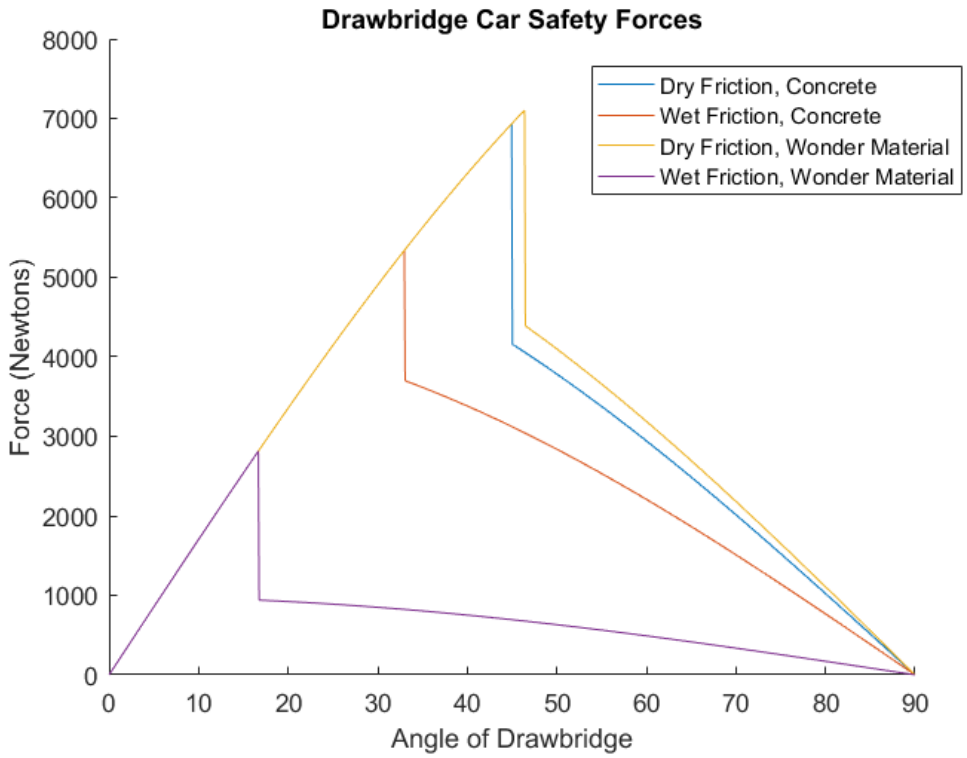
1. [Collaboration] You are designing a drawbridge that crosses a major waterway. While there should be no cars on a drawbridge when the bridge goes up, things happen. Your lawyers want to know whether cars will slide down the drawbridge when it goes up, and would prefer if you designed it so most cars will not.



Write a MATLAB function that determines the force of friction for any car on your drawbridge, for a given set of angles and a given set of friction coefficients. Please see the instructions on the recitation slides.

Once you have created your function, try it out for different materials. The obvious choice here is going to be concrete. Calculate the frictional force for dry and wet concrete for a range of angles between 0 and 90. Bob, your partner in design, things that a new paving material, “wonder material,” might be a good option. Calculate the frictional forces for the same range of angles for dry and wet wonder material. Plot all four friction force arrays against the angle arrays on the same plot, and label them. Include your netID in the title of your plot. Submit this plot AS AN

IMAGE. You can use the same naming conventions for this image that you do for .m files. **You do not need to submit any plotting code for this problem, just the image of your plot and the function you created. Your plots should look like this:**



Talk to your classmates about which material would be better for your design.

2. [Collaborative] Create a function that solves a linear system of equations, as described on the slides for this recitation.