Optimization, Root-Finding, and Floating Ducks

Please seat yourself with your Project 3 teammate and read through the rest of this document.

Today's Agenda

Today we'll pull together the material on optimization and root-finding from chapters 16, 21, and 23, and practice these techniques in the context of a rather silly but hopefully illustrative problem about a partially submerged duck. You will also have an opportunity to continue working on Project 3.

Using `fsolve`

What does `fsolve` do? Why does it require an initial guess?

In the coffee cooling example, state in your own words why we might be interested in finding a value of r using `fsolve`? What kind of modeling work is this?

The Duck Problem

Use this space to record notes on your implementation of the solution to the problem. What is the equilibrium value of d?

Reflection Questions

How are things going with the project so far? What do you see as the major risks at this point, and what are you doing (or what do you think you should be doing) to mitigate them? Consider factors like project scope, implementation challenges, and teaming issues.

Next Steps

Before class on Tuesday, please do the following things:

- ☐ Write your name here: _____
- ☐ Write your partner's name here: _____
- ☐ By tonight: Scan this worksheet and submit it on Canvas.
- ☐ Read and run the Chapter 23 notebook.
- ☐ Read Chapter 25 and complete the reading quiz.
- ☐ Reminder: The Orbital Mechanics notebook is due on Wednesday night. Please sign up for a NINJA check-off slot.
- ☐ The Project 3 Model Development team worksheet and Final Proposal are due on Sunday night. These will the main artifacts you will discuss with your instructor next Monday or Tuesday, along with whatever implementation work you have done by that point.