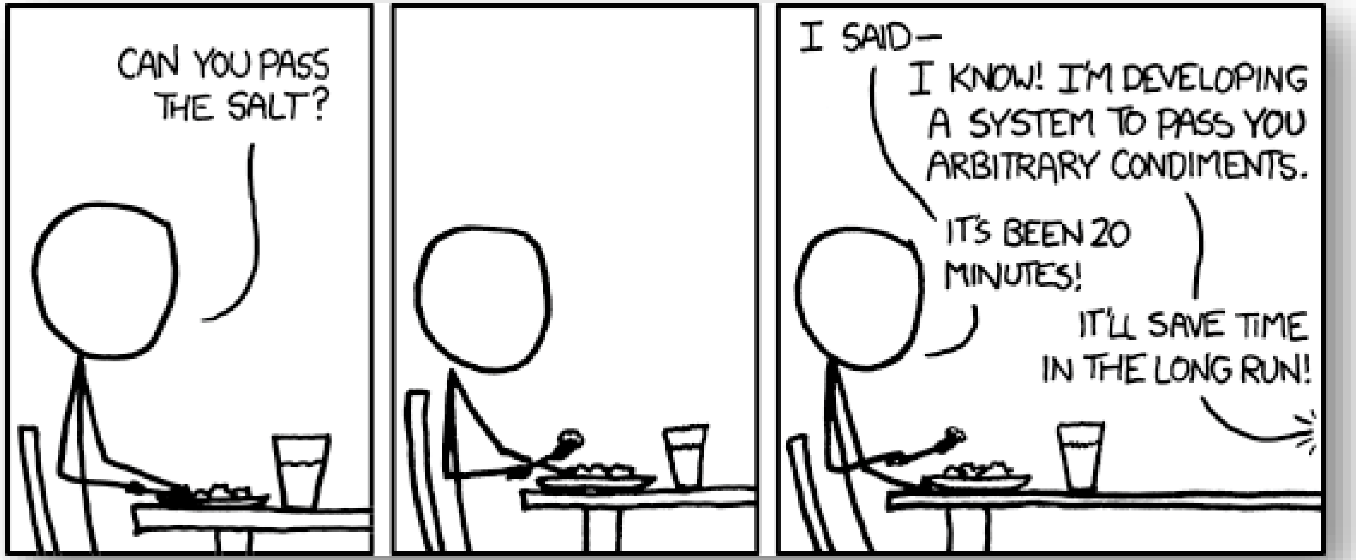

CAN YOU PASS THE SALT?
I SAID—
I KNOW! I'M DEVELOPING A SYSTEM TO PASS YOU ARBITRARY CONDIMENTS.
IT'S BEEN 20 MINUTES!
IT'LL SAVE TIME IN THE LONG RUN!

https://xkcd.com/974/

Make meaningful parts of your code reusable

FUNCTIONS

Topics

- Introduction: GUI and basic calculations
- Coding 1: Scripts, style, and variable classes
- Coding 2: Control statements and loops
- Visualization 1: Basics, subplots, get and set
- Coding 3: Functions
- Visualization 2: Descriptive plots
- Coding 4: Basic input and output
- Visualization 3: Distribution and 3D plots
- Coding 5: Input and output specials – last lecture before holidays
- Machine Learning 1: Introduction and dimension reduction
- Machine Learning 2: Clustering
- Machine Learning 3: Classification
- Coding 6: Efficiency and debugging basics
- Coding 7: Advanced functions and debugging

Excursion: Good coding practices

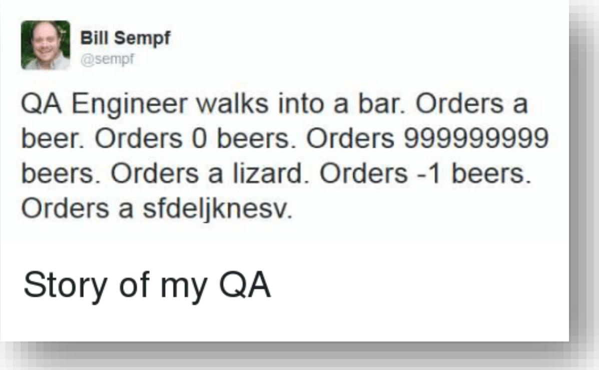
- Hard vs soft coding
  - Hard coding: have parameters set somewhere inside your script
    - Tempting, if you‘re in a hurry, but painful to debug
  - Soft coding: set parameters as variables in the beginning of your script
    - Never overwrite your parameters somewhere inside your script
      - NEVER overwrite your parameters inside your script
        - Seriously.
- DRY: Don‘t Repeat Yourself („Copy & Waste“)
  - If you copy code without meaningful modification, you‘re making a mistake.
  - Wrap it in a function
- Test your software or your users will. Assume the DAU.
- Don‘t run scripts that assume variables in the workspace. Use functions!
- No broken windows, don‘t get boiled like a frog.

Functions

- Scripts that take input and give output
- Have their own workspace, can not access outside variables
  - Global variables are possible but in most cases evil.
- Own functions should have the same filename as their function name
- Syntax: function outputs = function_name(inputs)
- Noteworthy examples:
  - length, size, numel, find, max, min, abs, sqrt, rand, randn, randi, sum, prod, linspace, mean, nanmean, var, nanvar, std, num2str, str2num, cell2mat, mat2cell, deal, regexp

Writing a function

- Check which for function and variable names before!
  - "edit", "help", "doc", "lookfor"
- Help description first:
  - copied function line, outline of function, inputs, outputs, examples, author (don't use email address because of potential spambots, use website if you must), potentially license
- Code:
  - input checks
  - computation
  - output
- Spacing, new lines, and indentation (CTRL-I).
  - "..." can be used to create linebreaks without MATLAB treating them as such



Bill Sempf
@sempf

QA Engineer walks into a bar. Orders a beer. Orders 0 beers. Orders 999999999 beers. Orders a lizard. Orders -1 beers. Orders a sfdeljknesv.

Story of my QA

The MATLAB Path

- Tell MATLAB where to look for files and scripts
- Everything you want to use has to be in the path
  - Current folder counts
  - Current folder navigation/modifications: cd, pwd, dir, mkdir, rmdir
- Modify the path at “Home -> Set Path -> Add Folder”
  - Counts for all users, so be careful!
  - Addpath, genpath -> only for one session, gone when you close MATLAB
  - Safest: Create a startup.m file in the “userpath” that gets executed whenever you start MATLAB