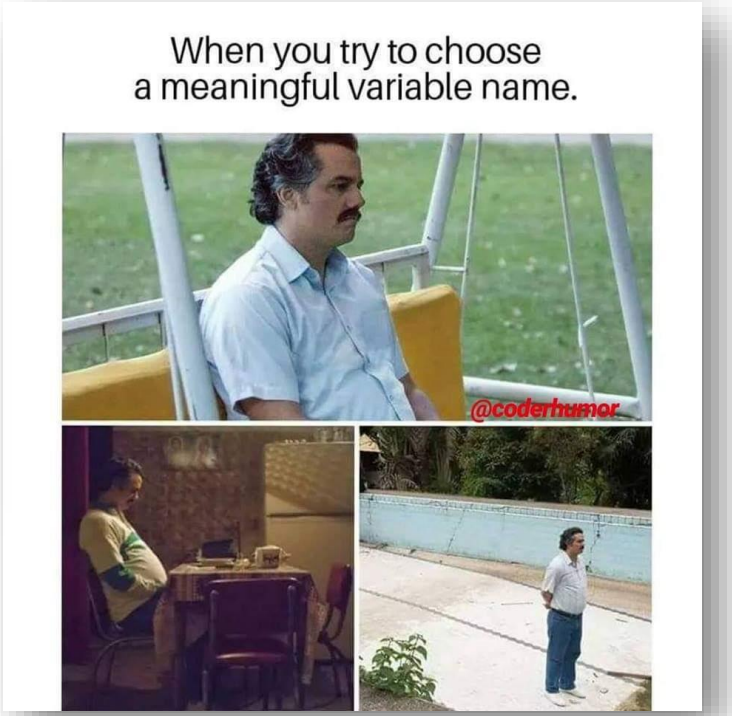


How to write code that you can still read later, and what type of data you can find in MATLAB

SCRIPTS, STYLE, AND VARIABLE CLASSES

Topics

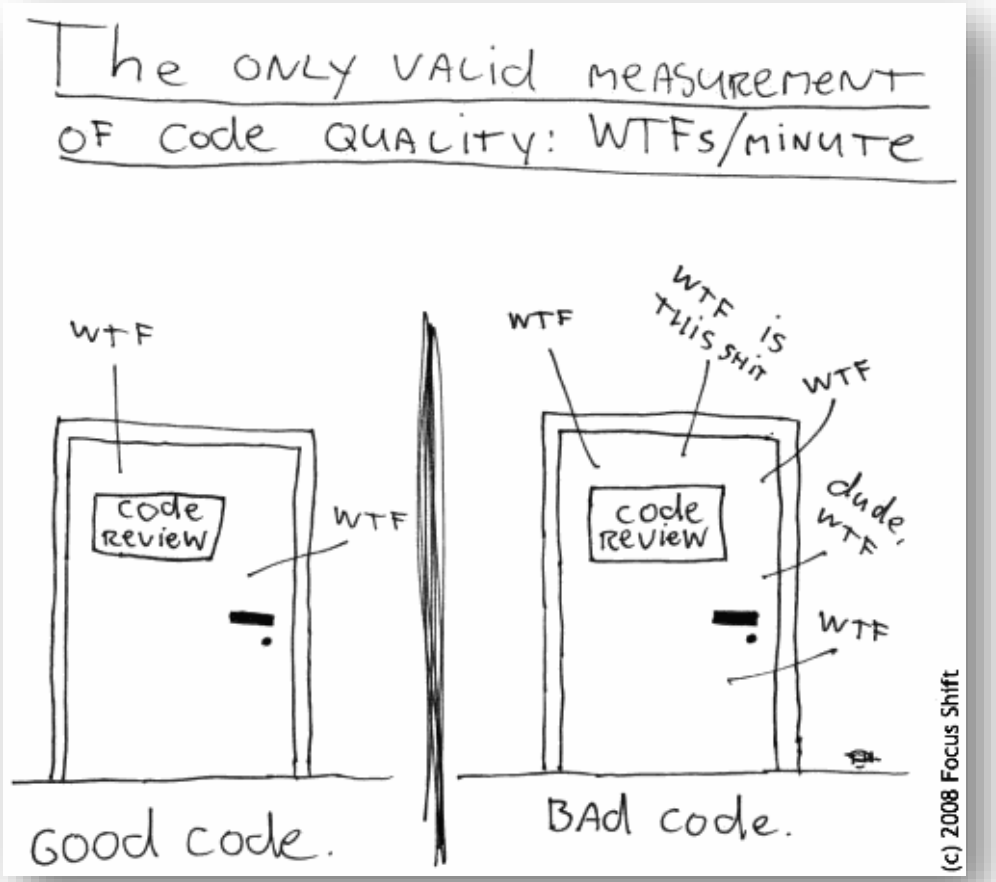
- Introduction: GUI and basic calculations
- Coding 1: Scripts, style, and variable classes
- Coding 2: Control statements and loops
- Visualization 1: Basics, subplots, get and set
- Coding 3: Functions
- Visualization 2: Descriptive plots
- Coding 4: Basic input and output
- Visualization 3: Distribution 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

Scripts

- Text files with code and *.m file extension
  - Best viewed in the MATLAB Editor, but you can choose!
- Comments with % (CTRL-R, CTRL-T)
- Code Sections with %%
  - Can be folded
- Play button (F5) to run entire script
  - Right click -> Evaluate selection (F9) to run highlighted text
  - CTRL-Enter to run code sections

Style


DIRTY CODE IS LIKE CRYSTAL METH
AT FIRST YOU GO FAST THEN YOU GO MENTAL
memegenerator.net


The ONLY VALID MEASUREMENT OF CODE QUALITY: WTFs/MINUTE
WTF
code review
WTF
Good code.
WTF
WTF is this shit
WTF
code review
dude, WTF
WTF
Bad code.
(c) 2008 Focus Shift

Style

- Makes the code readable, reusable, and adaptable
- Makes it easier to avoid, find, and fix bugs
- Programming style is personal, but guidelines are very helpful
  - Understanding the importance of clean code is an essential part of the course. You will get badly styled code to clean.
- Comments
  - Own line, discuss code reasoning and goal
  - The better the code, the fewer comments are necessary.
- Indents for functions and control loops

Variable Naming

- Rules
  - Cannot start with numbers
  - Cannot contain special characters except “_”
- Recommendations
  - Avoid single letter variables, except for very simple testing
  - Avoid overly long variables that just annoy everyone
  - Use **short**, but **meaningful** names
    - No abbreviations like ("compwid" vs "compute_total_width“)
      - It’s a disease you can find all over MATLAB scripts for some reason but it’s horrible
  - Avoid names that already exist (check "which <variable>" first, if unsure)
  - Prefixes: n, i, is, has, can, do, check, compute, find, etc.

Variable Naming

- Separate words with
  - camelCase (common in other languages, _ is being used as subscript in MATLAB)
  - usage_of_underscores (better readability)
  - Both are legit options, but stick to one!

Variable Classes I

- Numerics
  - Scalars, Vectors, Matrices
    - Indexing with (i), deletion with = []
  - Integers, doubles, singles
- Character arrays
  - Strings also exist, but char is most frequent
- Logicals
  - True/false, using == ~= < > <= >= or other functions, combined with && and ||
- ~~Structs~~
  - ~~Flexible and complex, combination of fields and values, indexing by „.“~~
- ~~Cells~~
  - ~~Can hold different classes, indexing with {i}~~
- ~~Test with „class()“, is*(), or isa(x,‘<class>‘)~~