



When you try to choose a meaningful variable name.



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



snake_case

Pros: Concise when it consists of a few words.
Cons: Redundant as hell when it gets longer.
push_something_to_first_queue, pop_what, get_whatever...



PascalCase

Pros: Seems neat.
GetItem, SetItem, Convert, ...
Cons: Barely used. (why?)



camelCase

Pros: Widely used in the programmer community.
Cons: Looks ugly when a few methods are n-worded.
push, reserve, beginBuilding, ...



skewer-case

Pros: Easy to type.
easier-than-capitals, easier-than-underscore, ...
Cons: Any sane language freaks out when you try it.



SCREAMING_SNAKE_CASE

Pros: Can demonstrate your anger with text.
Cons: Makes your eyes deaf.
LOOK_AT_THIS, LOOK_AT_THAT, LOOK_HERE_YOU_MORON, ...



nocase

Pros: Looks professional.
Cons: Misleading af.
supersexyhippocampus, bool penisbig, ...



fUcKtHeCaSe

Pros: Can live outside of the law.
Cons: Can be out of a job.



SPONgeBob CaSE

Pros: can mock your colleague for choosing a stupid variable name
Cons: you're really unlikeable

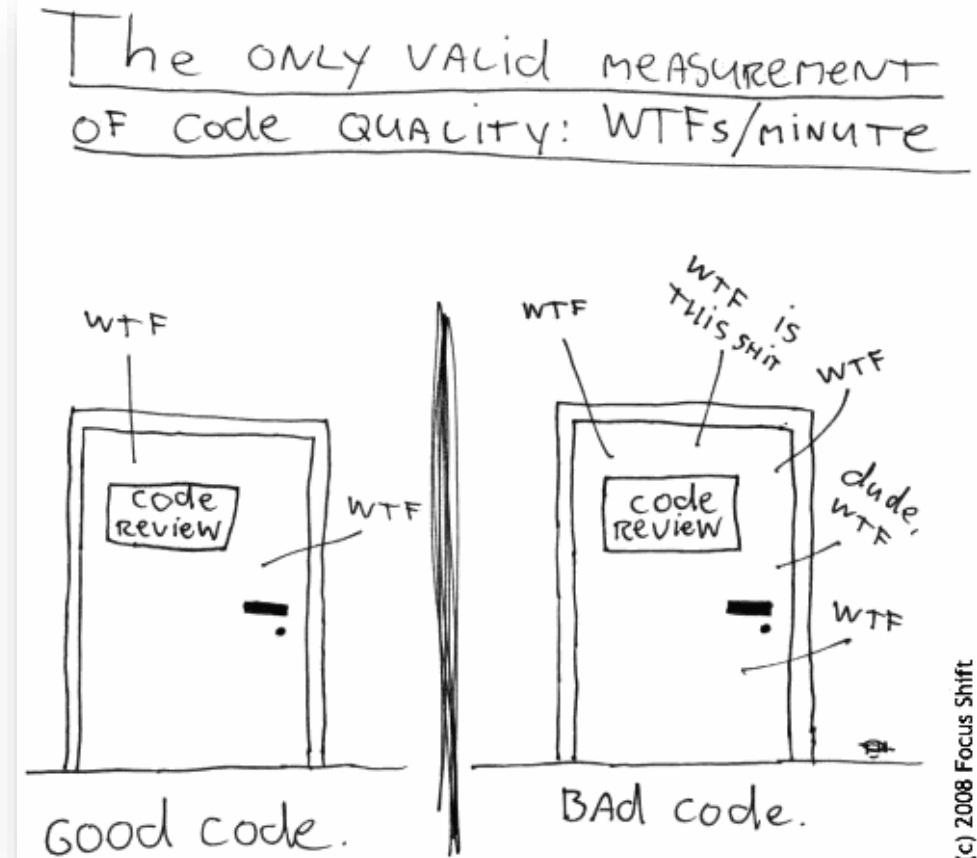
Topics

- 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



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.

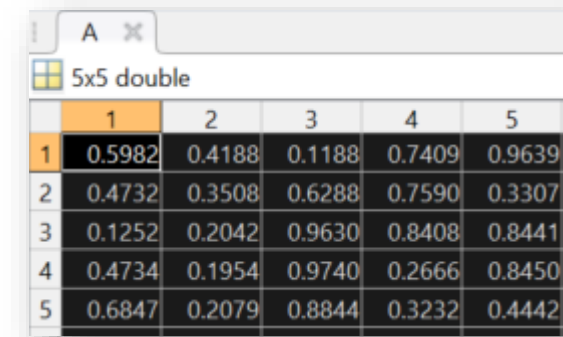


Variable Naming

- 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!

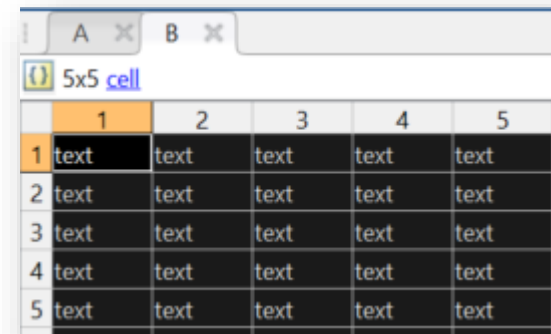
Variable Classes I

- 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>')~~



A screenshot of a MATLAB window titled 'A' showing a 5x5 double matrix. The matrix contains numerical values ranging from 0.09639 to 0.9740. The first row and first column are highlighted in orange.

	1	2	3	4	5
1	0.5982	0.4188	0.1188	0.7409	0.9639
2	0.4732	0.3508	0.6288	0.7590	0.3307
3	0.1252	0.2042	0.9630	0.8408	0.8441
4	0.4734	0.1954	0.9740	0.2666	0.8450
5	0.6847	0.2079	0.8844	0.3232	0.4442



A screenshot of a MATLAB window titled 'B' showing a 5x5 cell array. All cells contain the text 'text'. The first row and first column are highlighted in orange.

	1	2	3	4	5
1	text	text	text	text	text
2	text	text	text	text	text
3	text	text	text	text	text
4	text	text	text	text	text
5	text	text	text	text	text