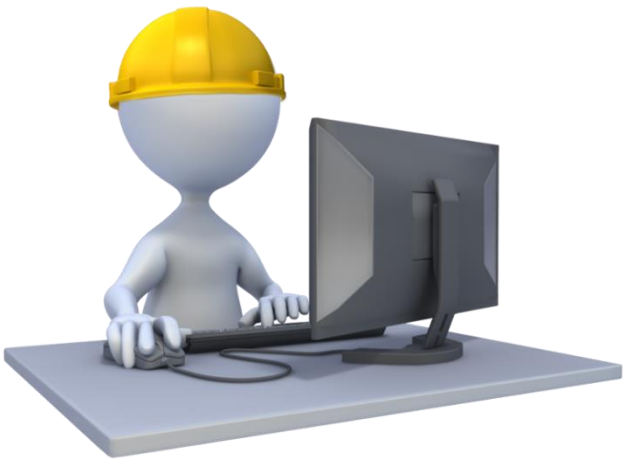
Computation Method (MATLAB Programming)



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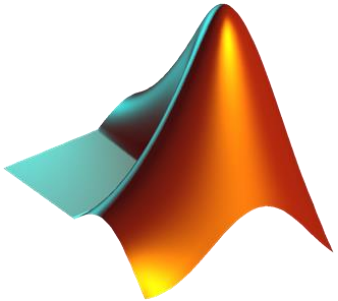
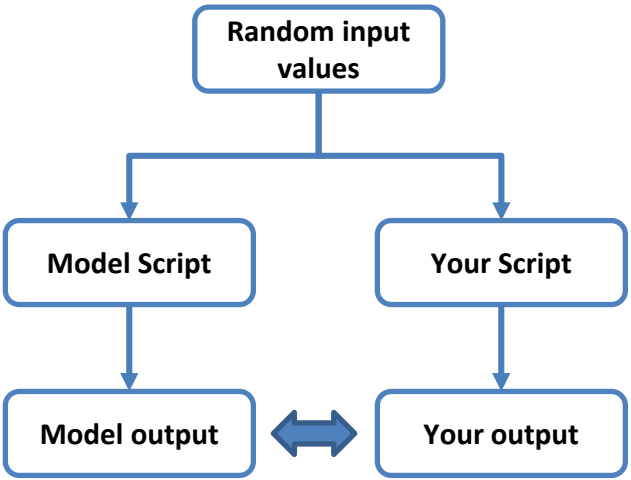
What & Why is MATLAB?

MATLAB is a high-level technical computing language and interactive environment for algorithm development, data visualization, data analysis, and numeric computation.

- Very powerful software package
- Many mathematical and graphical applications
- Has programming constructs
- Also has many built-in functions
- Can use interactively in the Command Window, or write your own programs
- Easy to debug your program
- In the Command Window the >> is the prompt
  - At the prompt, enter a command or expression
  - MATLAB will respond with a result



MATLAB Grader



The random number generator is to avoid your hard-coding in your assignments.

MATLAB® Grader™ is a browser-based environment for creating and sharing MATLAB coding problems and assessments. It's an auto-grading system.

An instructor designs several testers (assessments) to check your script if

- Correct outputs are generated from random inputs;
- Variables are properly defined;
- Keywords (e.g., built-in function) are present or absent.

Conventions Used in This Course Material

- **bold,** *Italic* and/or Red
  Used for highlighting or introduce a new concept, terms, or structure
- `Constant width`
  Refer to program elements such as variable or functions names used in MATLAB scripts

⚠: This element indicates a warning or caution.

☺: This element signifies a tip or suggestion.

🕮: This element signifies a general note.

Topic (next to a slide title)

- Remind
  Math formula or concept
- Optional
  Optional topic or tips
- Challenging
  Challenging subjects

Conventions Used in This Course Material (Continue)

Editor or Script Window

```
% variable = expression
a1 = 3
a2 = 5
```

```
1  % variable = expression
2  a1 = 3
3  a2 = 5
4
```

Example level

 : Easy

 : Moderate

 : Difficult

Workspace

Name	Value
a1	3
a2	5

Command window

```
>> a

a =

     1
```

The above script is simplified as

```
a    1
```

Navigating This Course Material

- Unless you are an experienced MATLAB programmer, you should review Module 1, where I have placed a condensed summary of MATLAB programming.

- This course material will be distributed as “image” in a PDF format so that students cannot copy scripts. Typing and running scripts yourself in MATAB is a crucial process to learn programming. Do not skim the code.

- Solve problems yourself first and then review model solutions.

- Please do not jump into future modules because each module is built up prior module(s).

References

- Stormy Attaway, 2018, Matlab: A Practical Introduction to Programming and Problem Solving, 5th edition
- Lecture slides for “Matlab: A Practical Introduction to Programming and Problem Solving”
- Holly Moore, 2018, MATLAB for Engineers, 5th edition

Acknowledgement

- Noreen Gao (S20), Vlad Andrei Fierastrau (S20)
- Jason Connelly (S19), Juan Park (S19)