

Week 1 Homework Assignments: Introduction to MATLAB

Global Requirements

- Add, commit, and push all deliverables to your Week01 folder in your repository.

1. Exploring the MATLAB Interface

Task

Perform a guided tour of the MATLAB interface.

Instructions

- Open MATLAB and explore the different components:
 - **Command Window:** Use it to enter commands and see immediate results.
 - **Workspace:** Check how variables appear as you create them.
 - **Editor:** Create a new script file and save it with a name like `week1_script.m`.
 - **Command History:** Observe how it records the commands you enter.

Deliverables

1. `report.txt` (1-2 paragraphs) describing the purpose of each interface component and your observations while exploring.
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2. Basic Commands and Calculations

Task

Practice using basic MATLAB commands and performing simple calculations.

Requirements

- In the Command Window, perform basic arithmetic with variables.
- Use `clc` to clear the Command Window, `clear` to remove variables from the Workspace, and `whos` to inspect current variables.

Deliverables

1. `week1_commands.m` with several arithmetic operations. Include comments explaining what each command does. Additionally, answer:
 - What does `clc` do?
 - What happens when you use `clear`?
 - What does `whos` display?
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3. Using the Help System

Task

Learn to use MATLAB's help system to find information on specific commands and functions.

Requirements

- Use the `help` command or MATLAB documentation to research: `fprintf`, `plot`, and `disp`.
- For each function:
 - Write a brief summary of what it does.
 - Provide an example of how to use it, with comments.
 - Experiment with a simple example (e.g., use `fprintf` to format and display a message; `plot` for a basic graph; `disp` to display text/variables).

Tips for Exploration

- Use `help disp` to learn about the `disp` function.
- `disp` is convenient for simple output without formatting.
- For formatted outputs (combining text and numbers), use `fprintf`.

Deliverables

1. `functions_exploration.txt` with a summary and example for each function (`fprintf`, `plot`, `disp`).
 2. `functions_exploration.m` demonstrating your examples.
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4. Simple Script Creation

Task

Write a simple script to perform a basic task; calculate the area of a rectangle.

Requirements

- Create a new script `calculate_area.m`.
- Compute the area of a rectangle using variables for length and width.
- Print the result in a user-friendly format using `disp` or `fprintf` to match the example format:
 - The area of a by rectangle is

Tips

- Use `fprintf` for mixed text and numbers, or read `help disp` to see options for displaying values.
- To print numbers alongside text, format them (e.g., with `fprintf`).

Example Output

The area of a 5 by 10 rectangle is 50

Deliverables

1. `calculate_area.m` with comments explaining each line. Test with different values for length and width and note the results in comments.
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5. Bug Hunt Challenge

Task

Practice debugging by identifying and fixing errors in a MATLAB script.

Instructions

1. Copy the provided buggy MATLAB code to `buggy_script.m`.
2. Run it and observe any errors or unexpected behaviors.
3. Identify and fix the bugs (syntax, logic, or runtime). Use comments to explain each fix you make.

Example Buggy Script (`buggy_script.m`)

```
% Task: Calculate the area of a circle and display the result
```

```
radius = 5
area = pi * radious^2
disp('The area of the circle is: ', area) % Incorrect use of disp function
```

Deliverables

- `fixed_script.m` with comments explaining the errors you found and how you fixed them.
 - `debugging_report.txt` including:
 - A summary of the errors encountered.
 - How you diagnosed and fixed them.
 - What you learned from the debugging process.
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Definition of Done

- You have a GitHub repository with `gberl001` invited as a collaborator.
- Your `Week01` folder contains at minimum:
 - `buggy_script.m`
 - `calculate_area.m`
 - `debugging_report.txt`
 - `fixed_script.m`
 - `functions_exploration.m`
 - `functions_exploration.txt`
 - `report.txt`
 - `week1_commands.m`