

## Week 1 — Project Start Output

### Goal:

Define the project and build the initial UI skeleton.

### Required Outputs:

- ☐ Project title + 1-paragraph description (what problems it solves)
- ☐ List of 3 sample problems the app will support
- ☐ UI skeleton implemented: Inputs, Compute, Clear, Final Answer, Solution Trail panel
- ☐ Project folder/repo initialized (basic structure)

Evidence to Attach

- ☐ Screenshot: main UI (trail panel visible)
- ☐ Screenshot: placeholder trail output after clicking Compute

### Reflection: (Write short answers)

- What was completed this week?
- What is your plan for Week 2?

### Weekly Sign-off:

Group Leader Name/Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Member Name/Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Member Name/Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **Numeric: Newton-Raphson Root Finder (Predefined Functions)**

Newton-Raphson Root Finder is a numerical method used to find the roots of an equation. It is useful when an equation is too complicated to solve using algebraic expressions. Newton-Raphson provides a practical way to approximate the solution that cannot always be rearranged or factored easily using equations that involve powers, exponentials, logarithms, or trigonometric functions. This method is commonly used to solve nonlinear equations that are difficult or impossible to solve exactly by hand. Instead of finding an exact symbolic answer, the Newton–Raphson method produces a numerical approximation that gets very close to the true root. Due to its fast convergence, Newton–Raphson is commonly implemented in calculators, programming libraries, simulations, and optimization algorithms.

### **Sample Problems Supported**

**The application currently supports the following nonlinear equations:**

1.  $f(x) = x^3 - x - 2$
2.  $f(x) = \cos(x) - x$
3.  $f(x) = e^x - 3x$

## UI Skeleton Implemented

Newton-Raphson Root Finder

Newton-Raphson Numerical Solver

Function:  $e^x - 3x$

Initial Guess ( $x_0$ ):

Convergence Tolerance::

Solution Trail

Final Answer:

Compute

Clear

Newton-Raphson Root Finder

Newton-Raphson Numerical Solver

Function:  $\cos(x) - x$

Initial Guess ( $x_0$ ): 78

Convergence Tolerance:: 4

Solution Trail

Final Answer: -2.244517

Compute

Clear

Iteration 1:  $x = 25.913523616287023$ ,  $f(x) = -78.85780309324498$   
Iteration 2:  $x = 11.121507715796916$ ,  $f(x) = -25.203160532879348$   
Iteration 3:  $x = -1377.4013634228065$ ,  $f(x) = -10.99590689154504$   
Iteration 4:  $x = 77628.86993597863$ ,  $f(x) = 1377.5872903713507$   
Iteration 5:  $x = 8020.526974448483$ ,  $f(x) = -77627.87659474819$   
Iteration 6:  $x = -343.2308051820437$ ,  $f(x) = -8021.526136939768$   
Iteration 7:  $x = -143.55098223092952$ ,  $f(x) = 342.5320968593993$   
Iteration 8:  $x = -64.38433950430644$ ,  $f(x) = 144.12263310718959$   
Iteration 9:  $x = 384150.4971888292$ ,  $f(x) = 64.40264837553576$   
Iteration 10:  $x = 89987.84850380453$ ,  $f(x) = -384151.4492476206$   
Iteration 11:  $x = 5768.407350696332$ ,  $f(x) = -89986.85085136596$   
Iteration 12:  $x = 1731.9909690585978$ ,  $f(x) = -5767.50398326824$   
Iteration 13:  $x = -8271.925484885878$ ,  $f(x) = -1732.5534467179393$   
Iteration 14:  $x = -832.6577465305545$ ,  $f(x) = 8270.931753460332$   
Iteration 15:  $x = -100.00052241400069$ ,  $f(x) = -921.556029750000$

## Project Folder / Repository Structure

The screenshot shows a GitHub repository named 'NEWTON' by user 'Jem-Michael'. The repository is public and has 1 branch (main) and 0 tags. The commit history shows 4 commits, with the latest commit being '5185dfd' from 2 days ago. The commit message is 'remove log'. The commit history table lists the following files and their commit messages:

File	Commit Message	Time
README.md	Initial commit	2 days ago
week1.py	HELLO WORLD	2 days ago
week2.py	remove log	2 days ago

The README file is currently selected and shows the title 'NEWTON'.

## Reflection

### What was completed this week?

Our group completed the initial UI design first with a header, input fields, solution trail panel, and final answer display, and then implemented the basic functionalities, including the input sections for selecting a function, entering the initial guess, and specifying the convergence tolerance. Additionally, the compute and clear buttons were added, and the solution trail panel was set up to display step-by-step computations.

### What is your plan for Week 2?

Our group's plan for next week is to identify and fix any errors or bugs in the UI and basic functionalities. We also plan to add or implement error handling for invalid inputs, such as non-numeric values for the initial guess or tolerance, and ensure the app provides clear feedback to the user.

### Weekly Sign-off:

Group Leader Name/Signature:  CHARLES RUSSEL O. SAN JUAN Date: 2/26/2026

Member Name/Signature:  CHRISTINA GOMBA Date: 2/26/2026

Member Name/Signature:  JOHN MICHAEL TULALIAN Date: 2/26/2026