

Project Report

Project 1 ECE 528

A20561414 Saman Chouhan

Acknowledgement

I acknowledge all works including figures, codes, and writings belong to me and/or persons who are referenced. I understand if any similarity in the code, comments, customized program behavior, report writings, and/or figures are found, both the helper (original work) and the requestor (duplicated/modified work) will be called for academic disciplinary action.

Saman Chouhan

09/02/2025

Test Case Design :

1. Constructor and Basic Attribute Tests

- **testGetNameSuccess() and testGetNameNull()**
 - the test checks that the constructor initializes plug names correctly, including handling null values.
 - It also Verify initial states (isOn is false, getPower() returns 0.0).

2. Switching and Toggling Tests

- **testSwitchOff()**
 - this test calls switchOff() to turns off the plug and sets power to 0.
- **testToggleOn() and testToggleOff()**
 - for testing the plug toggle functionality for both states.

3. Power Measurement Tests

- **testMeasurePowerOnPowerZero()**
 - Check if measurePower() returns 0.0 when the plug is off.
- **testMeasurePowerOffNameDotNumber()**
 - checks against that plugs named with "name.P" set power to P when measured.
- **testMeasurePowerOffNameDotNumberParseError()**
 - that an invalid number format in the plug name throws NumberFormatException.

4. Random Power Fluctuation Tests

- **testMeasurePowerOffPowerGreateThan100Increase()**
 - makes sure that power increases by up to 100 watts if it is below 100.
- **testMeasurePowerOffPowerGreaterThan300Decrease()**
 - tests that power decreases by up to 100 watts if it exceeds 300.
- **testMeasurePowerOffPowerLessThan100OrGreaterThan300()**
 - Ensure power fluctuates within ±20 watts when it's between 100 and 300.

How did you implement the features? What classes have you added/modified?

switchOn() Method:

simple addition of “on=true” to set the state true and turn on the plug

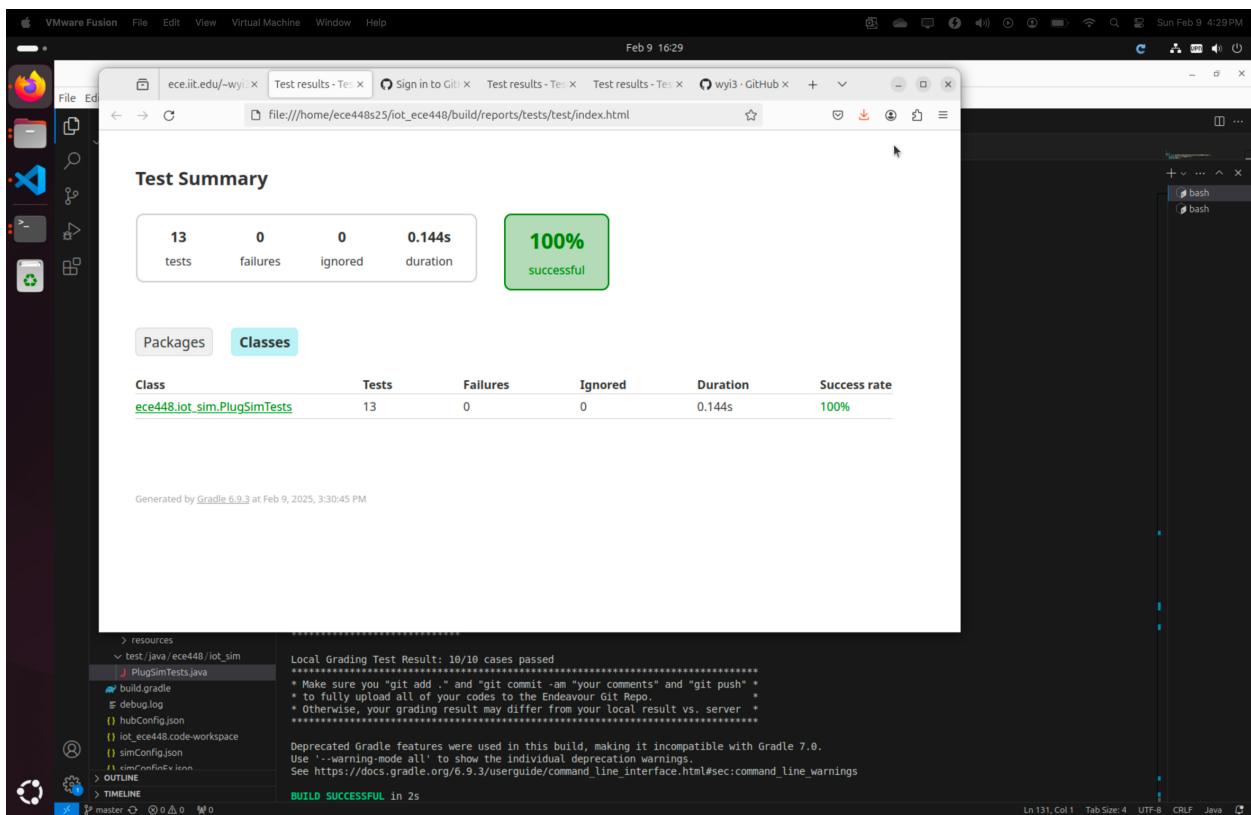
switchOff() Method:

Added logic to turn off the plug by setting “on = false”, and important updating the power to 0, and logging the change.

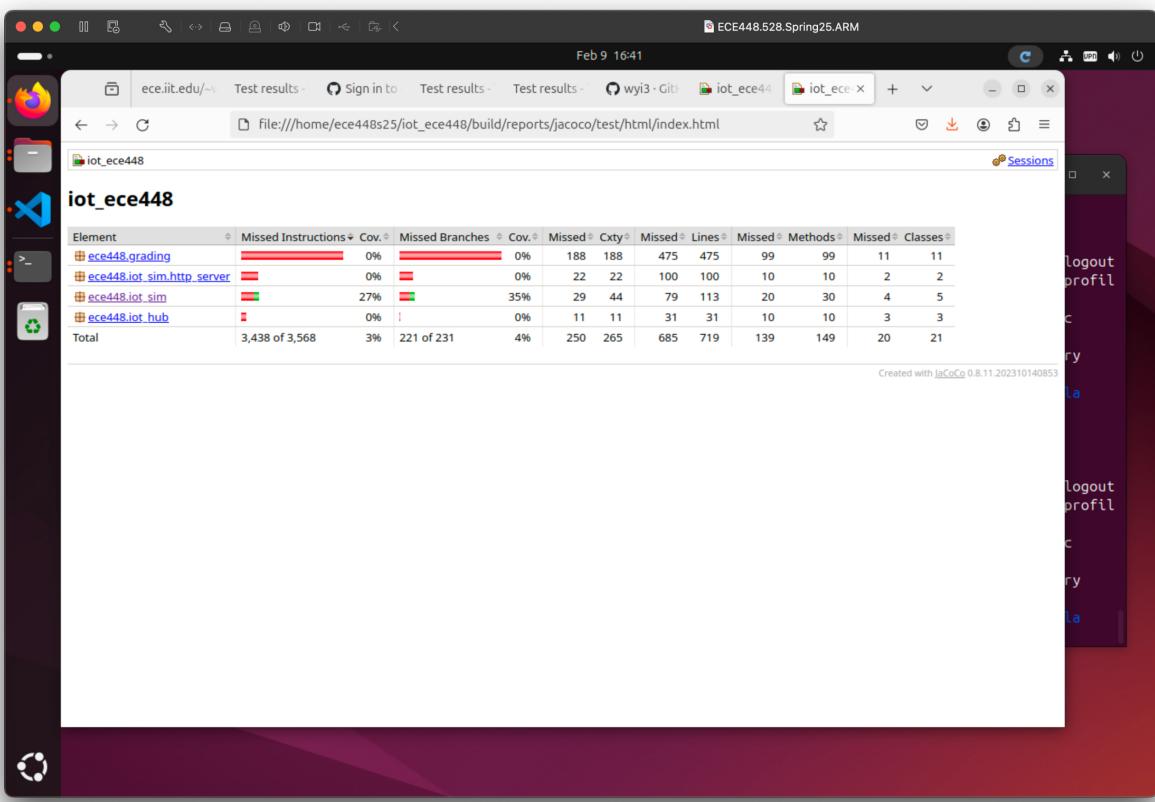
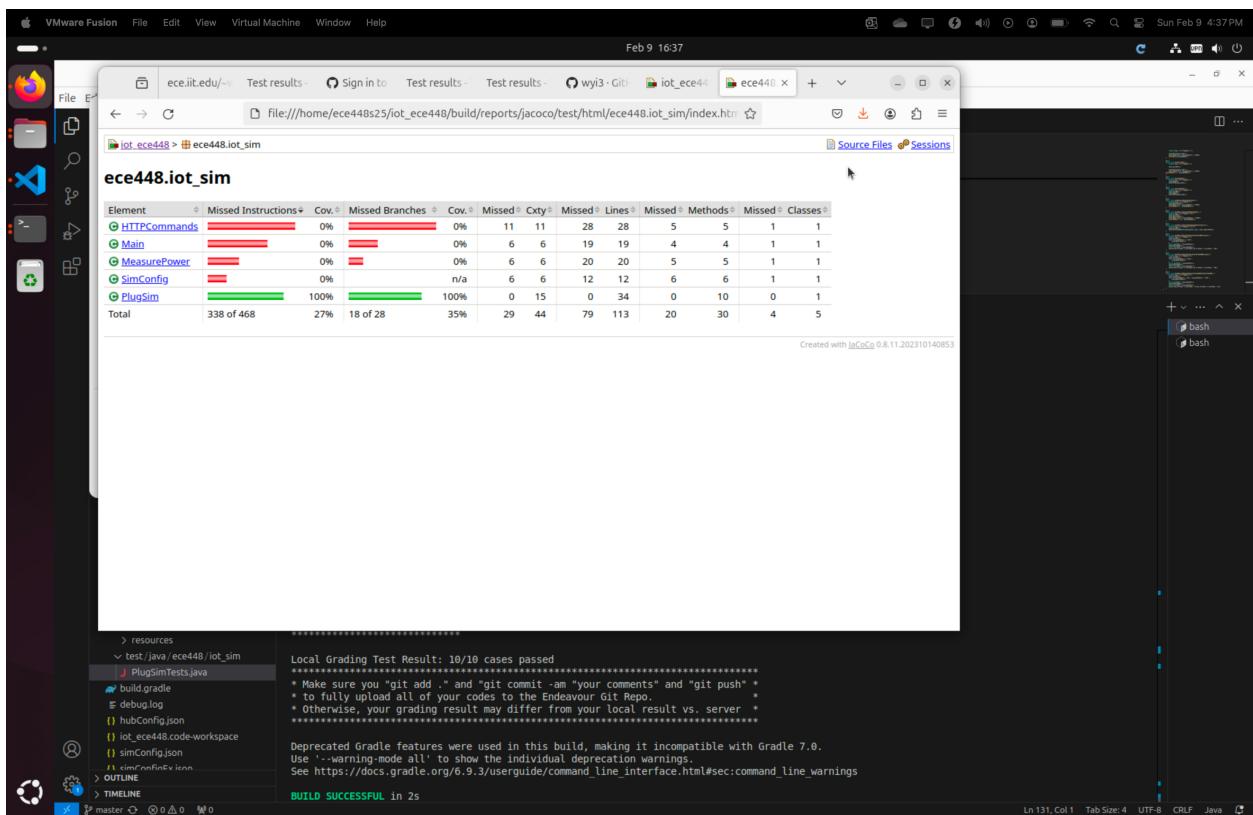
toggle() Method:

Added a condition to switch the plug between the on and off states. If it's already on, it calls switchOff(); otherwise, it calls switchOn().

Screenshot of Unit Test Report Page



Screenshots of the coverage report pages



Grading Test Cases

The screenshot shows a Visual Studio Code interface with the following details:

- File Explorer:** Shows the workspace structure under "IOT_ECE448 (WORKSPACE)". Key files include "PlugSim.java", "PlugSimTests.java", "build.gradle", "debug.log", "hubConfig.json", "iot_ece448.code-workspace", and "simConfig.json".
- Terminal:** Displays the output of a Gradle build command:

```
BUILD SUCCESSFUL in 2s
6 actionable tasks: 4 executed, 2 up-to-date
* ece448@2581:~/iot_ece448$ gradle grade_p1

> Task :grade_p1
***** testCase00 of GradeP1: pass
2025-02-09 15:30:45,760 INFO testCase00 of GradeP1: success
*****
***** testCase01 of GradeP1: pass
2025-02-09 15:30:45,762 INFO testCase01 of GradeP1: success
*****
***** testCase02 of GradeP1: pass
2025-02-09 15:30:45,763 INFO testCase02 of GradeP1: success
*****
***** testCase03 of GradeP1: pass
2025-02-09 15:30:45,763 INFO testCase03 of GradeP1: success
*****
***** testCase04 of GradeP1: pass
2025-02-09 15:30:45,764 INFO testCase04 of GradeP1: success
*****
***** testCase05 of GradeP1: pass
2025-02-09 15:30:45,764 INFO testCase05 of GradeP1: success
*****
***** testCase06 of GradeP1: pass
2025-02-09 15:30:45,765 INFO testCase06 of GradeP1: success
*****
***** testCase07 of GradeP1: pass
2025-02-09 15:30:45,765 INFO testCase07 of GradeP1: success
*****
***** testCase08 of GradeP1: pass
2025-02-09 15:30:45,766 INFO testCase08 of GradeP1: success
*****
***** testCase09 of GradeP1: pass
2025-02-09 15:30:45,767 INFO testCase09 of GradeP1: success
*****
```
- Output:** Shows the "Local Grading Test Result: 10/10 cases passed".
- Bottom Status Bar:** Displays "Ln 131, Col 1 Tab Size: 4 UTF-8 CRLF Java".