This software simulates the rocket system launch process.

## Software purpose

This software is built to support the research process of Rocket Launch Control System.

## Introduction to the Rocket Launch System that this software simulates.

The rocket system can have up to 8 pad units, each unit can launch up to 2 rockets and each rocket has 2 relays. For example, if the rocket system has 4 pad units, then it can launch up to 8 rockets. There is a launch controller in the system to command to individual pad unit to launch rockets. In order to launch a rocket, the rocket owner places the rocket on the pad unit to connect the pad-unit’s ignition to the ignitor in the rocket. The owner can press a button on the pad unit to send an activation signal to the controller. When the controller gets the pad activated signal, the Launch Control Officer (LCO) can press an armed button on the controller sending a pad armed signal to pad unit to close the first of two relays. However, if the controller does not receive any signals from LCO in 10 seconds after receiving the pad activated signal, the rocket will be reset to original state. After the pad unit is ready to launch and the owner is back to a safe place, the LCO presses a rocket launch button on the controller. This button causes a second relay to close providing current to the ignition system in the rocket causing the rocket to launch. After the launching of the rocket succeeded, the rocket is reset to original state. When the pad is ready to launch, if the LCO pressed an armed button, the rocket will be reset to original state.

Launch Logic

A screenshot of a cell phone

Description automatically generated

Note: In the software, Control Button State: Launch does not appear. Instead, the Control Button State: Inactive appears as the rocket state is reset immediately after launching successfully. Also, the Control Button State: Active does not appear. Instead, the user will be asked to command Reset or Armed Launch. If the user chooses Armed Launch, Control Button State: Launch Available will appear. If the user chooses Reset or give no commands in 10 seconds, then the rocket is reset and Control Button State: Inactive will appear.

## Software Instruction

To run the software, first open terminal at Rocket-launch-research-project/class directory. Then, run the command “*java Main”.* You can terminate the program anytime by input 0. When asked “Input0: Enter pad name: “, input a digit number (for example, 4). When asked “Input2: Enter action (only 1('activate') and 4('reset') are available)”, input a digit number (for example, 1).

After you finish a step in input rocket action, a table showing the state of all rockets will appear so that you can keep track of the state of each rocket.

-The End-