# Structure Chart Explanation – Smart Cooling Fan System

The diagram provided visually presents the structure chart of our MATLAB-based Smart Cooling Fan System. Below is a detailed description of each script/module, its purpose in the system, and the student responsible for it.

A diagram of a company

AI-generated content may be incorrect.

## 1. mainGUI.m

This is the top-level script that controls the flow of the simulation. It manages user input from the GUI, calls initialization and simulation functions, and handles 2D/3D plotting of results.  
Responsible Student: Khosrow Yameen (Software Engineering)

## 2. get\_user\_inputs.m

This helper script retrieves and processes user inputs entered through the GUI fields.  
Responsible Student: Samuel Gbemi (Mechanical Engineering)

## 3. initialize\_system.m

Initializes the state variables such as time steps, temperature array, and simulation parameters like alpha, beta, gamma.  
Responsible Student: Samuel Gbemi (Mechanical Engineering)

## 4. simulate\_smart\_fan.m

Contains the main simulation loop. It updates the temperature over time, determines fan speed based on temperature thresholds, and checks for shutdown conditions.  
Responsible Student: Samuel Gbemi (Mechanical Engineering)

## 5. fan\_speed\_to\_numeric.m

Converts categorical fan speed levels (e.g., Low, Medium, High) into numerical values for accurate plotting on the GUI.  
Responsible Student: Khosrow Yameen (Software Engineering)

## 6. Excel Export Logic

This logic is embedded within the simulation to export temperature data to an Excel file named 'temperature\_log.xlsx'.  
Responsible Student: Khosrow Yameen (Software Engineering)

## 7. publish\_script.m

A standalone script designed specifically to demonstrate the simulation process and generate a publishable report in HTML or PDF format.  
Responsible Student: Khosrow Yameen (Software Engineering)  
  
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