



IoT Final Project

Smart city reinvents itself with the most advanced network infrastructure and the Internet to empower digital services for stronger social, environmental, and economic outcomes in communities. Many challenges like overcrowding, increasing pollution, increasing traffic congestion, inadequate parking, inefficient use of street lighting, water, and waste management need to be solved. A lot of opportunities for new ideas and business.

In this context, Egypt invests in the **new administrative capital city**. The new capital is developed with the strategic vision for a smart city integrating its smart infrastructure to provide many services to citizens. *Smart traffic, smart utilities, safe city, smart homes and buildings, smart parking, smart public transportation, smart faculty, smart healthcare solutions, smart energy management, and smart emergency response systems* are types of smart services and applications that will be available.

Pick up one of these services and applications. Your task is to **propose** the system, **discuss** the benefits, and **provide** the system architecture, detailed design, and required functions.

Requirements

- **Select** the appropriate hardware components such as sensors, actuators, microcontrollers, based on your project requirements.
Use NodeMCU OR ESP32 OR Raspberry Pi as a gateway in the communication layer.
- **Integrate** hardware and software components to create a smart IoT system.
- **Implement** *MQTT* for interchanging messages between devices and gateway.
- **Develop** a user-friendly interface (mobile app OR website) for interacting with the system.
- **Use** *cloud services* OR *local server* to store and analyze your data.

Report

Deliver a *report* that includes the project requirements.

- **Define** the problem statement, objectives, scope, and proposed solution for the project.
- In a table, **identify** the inputs and outputs and briefly describe their meaning.
- **Identify** the sensors and actuators in the device layer.
For organization, in a table, **list** the sensors and actuators you used and their functions.
- **Provide** the necessary block diagrams and system architecture.
- **Propose** a test strategy to verify the operation of your project.
Carefully select an appropriate set of test cases.



Notes

- If you want to implement another idea, you have to discuss it and get approval from *Dr. Ahmed Shalaby* before you start implementation.
- Cheating leads to **ZEROS** for all team members, just **do your best**.

GOOD LUCK,

IoT Team