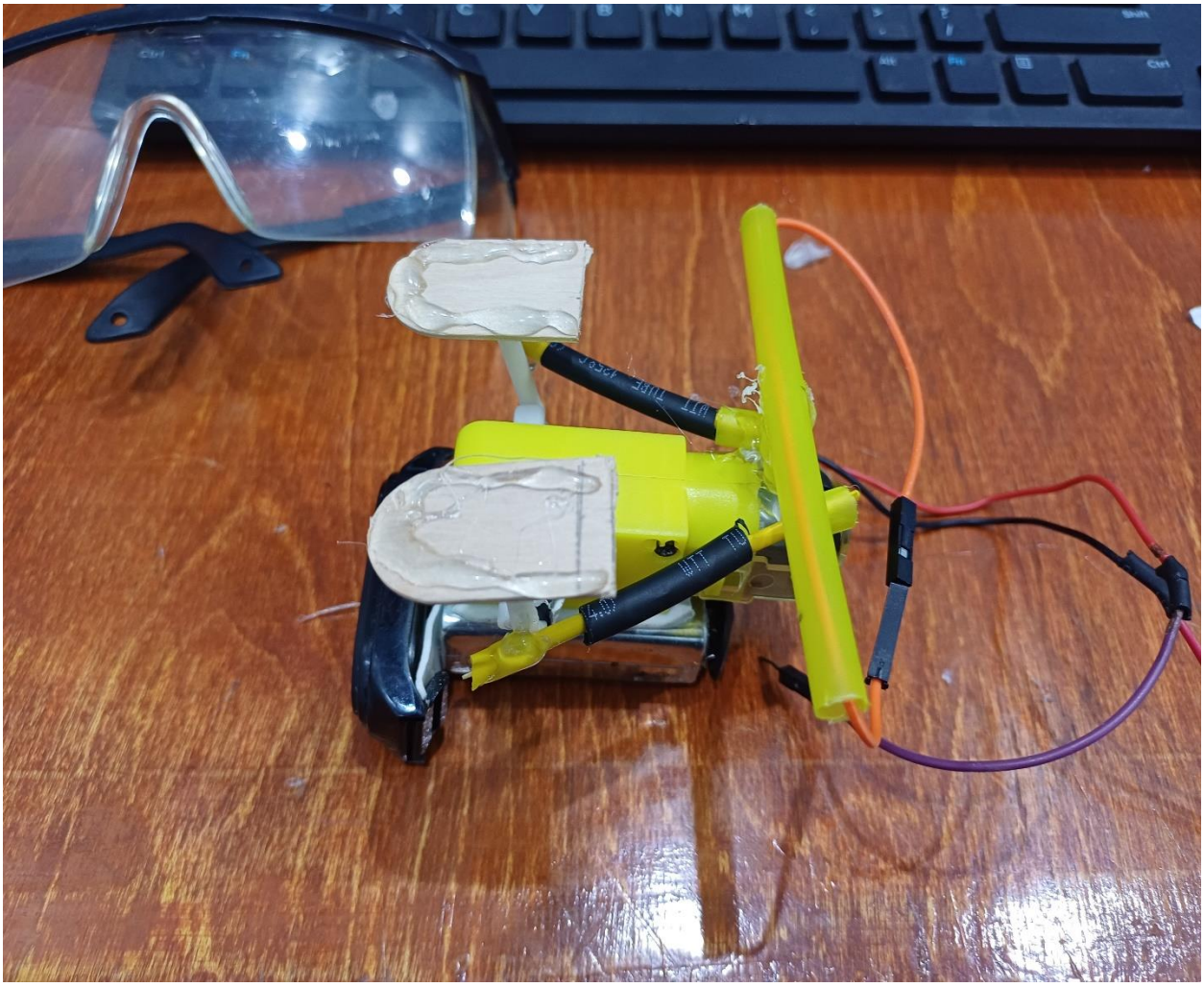
Mini Logic-Based Robot Using Basic Components and Engineering Concepts

Prepared by: Mahmoud Ayman

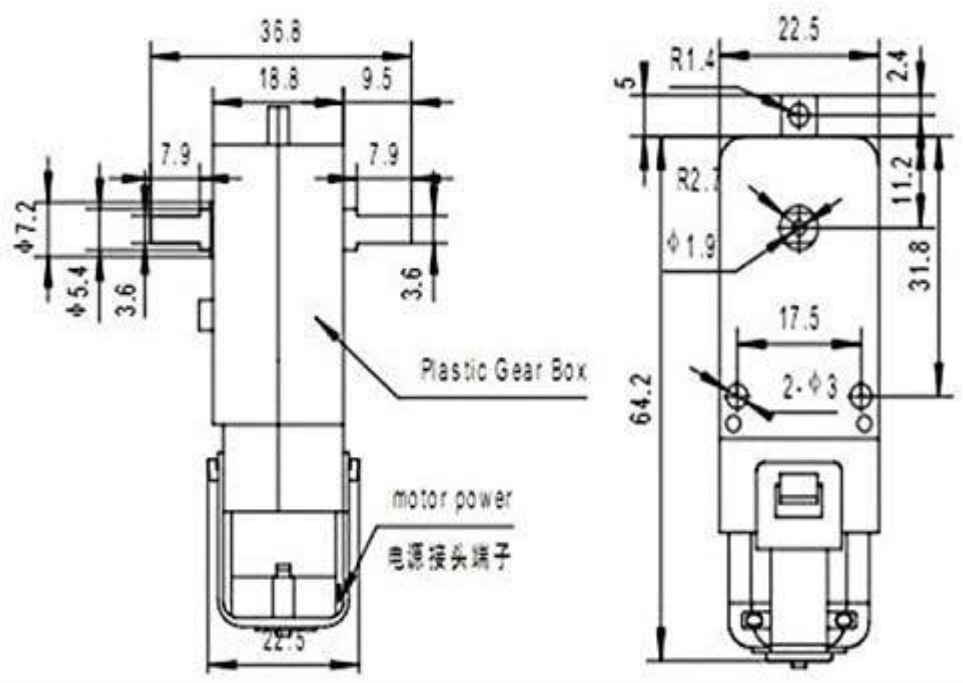
Faculty of Technology – Robotics Department

Academic Year: 2024/2025

This project presents a simple yet creative robot designed using basic components such as a toy car motor, battery, logic switches, and wires.

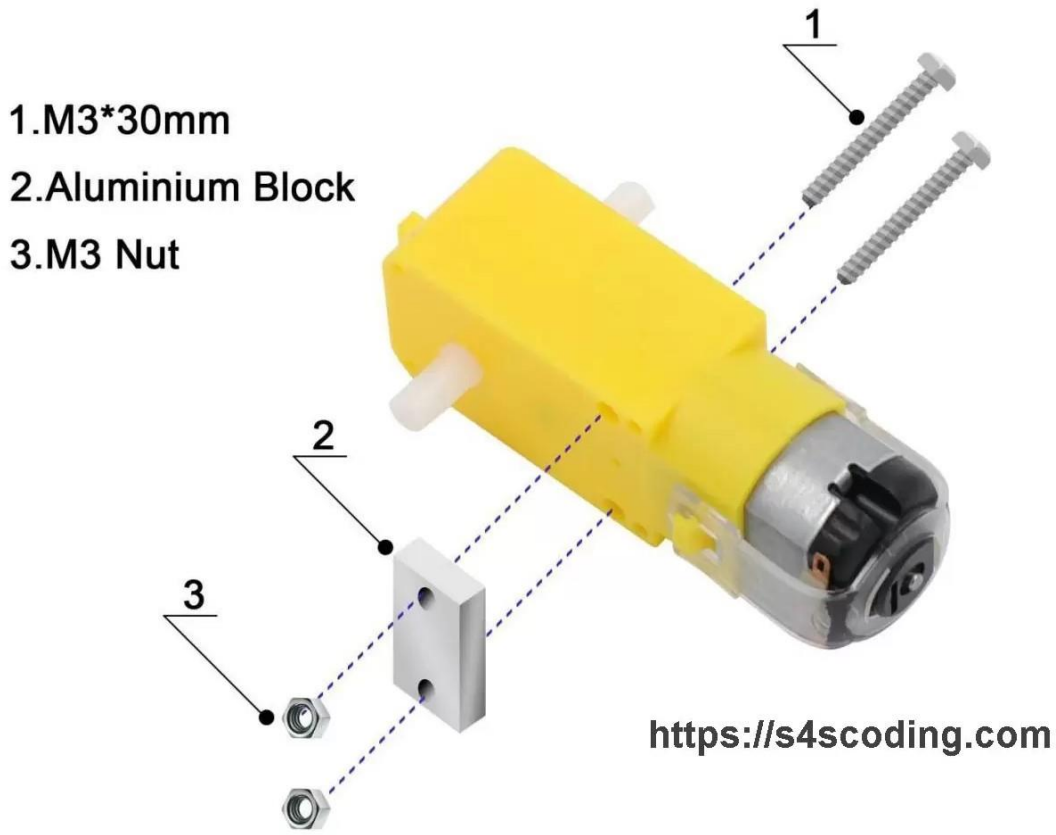


The robot moves in a random pattern once powered, but its design is based on solid principles of dynamics, trigonometry, and geometry, which give it both functional movement and a visually appealing structure.



The purpose of this project is to demonstrate how combining simple hardware with logical thinking and engineering principles can result in an innovative and effective robotic system.

It reflects the idea that creativity is not always about complex tools — sometimes, it's about how you use the basics wisely.



The main idea behind this project is to build a mini robot capable of moving autonomously using only basic hardware components and logic-based design.

Instead of using microcontrollers or complex programming, I focused on applying physical laws and logical circuits to create behavior. The motion is random, but it's triggered and shaped through calculated angles and layout based on trigonometry and geometry.

The body of the robot was carefully designed to be symmetrical and balanced, giving it an aesthetic and functional appearance.

Through this idea, I aim to prove that:

- Engineering is not just about advanced tools but smart application of what’s available.

- Creative solutions can emerge even from simple materials.

- Hardware understanding and mathematical thinking can lead to innovation, even without code.