**-22AIE442-  
Robotics operating system**

# **SWARM ROBOTICS FOR LOGISTICAL TRANSPORTATION HUB**

## **Team Details**

Team : 10

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# **Project Abstract**

## Grocery store centered

This project explores the implementation of swarm robotics in an automated grocery store environment, where multiple robots efficiently transport goods between designated pickup and drop-off depots. The focus is on optimizing robot movement through tight aisles, avoiding congestion, and dynamically adjusting routes to minimize traffic bottlenecks. Using ROS (Robot Operating System) for robot coordination and path planning, the system employs decentralized control, allowing each robot to make real-time decisions based on local sensor data. The prototype aims to simulate a small-scale environment with three pickup and three drop-off depots, demonstrating the effectiveness of swarm robotics in improving logistical efficiency in constrained spaces.

## Amazon hub centered

This project presents a prototype of a swarm robotics system designed to optimize the transportation of goods within a logistics hub, inspired by an Amazon warehouse. The hub includes three pickup depots, where packages are received and sorted, and three drop-off depots, where packages are prepared for shipment. Robots autonomously navigate through tight aisles and pathways, efficiently moving packages between depots while avoiding congestion and minimizing delays.

The system employs swarm coordination, enabling the robots to make real-time decisions for route optimization and traffic management. The prototype is intended to demonstrate how swarm robotics can enhance logistical operations in space-constrained environments, improving both speed and efficiency in handling goods.