IE 479 Fall 2023 Project 1
Strategic Expansion for an E-Commerce Company
Due Date: October 18, 17:00

1 General Information

E-commerce, has transformed the way businesses and consumers engage in trade and commerce. It represents the buying and selling of goods and services online, facilitated through websites, mobile apps, and digital platforms. This digital revolution has not only reshaped consumer behavior but has also brought about significant areas in distribution logistics.

The rise of e-commerce can be attributed to various factors, including the widespread availability of the internet, secure online payment systems, and the convenience it offers to shoppers. As a result, e-commerce has become a global phenomenon, with millions of transactions occurring daily across the world.

The success of e-commerce hinges on the efficient management of distribution logistics. Unlike traditional brick-and-mortar retail, e-commerce operations must navigate a complex web of challenges to fulfill customer orders promptly and accurately. Some areas where distribution logistics and the e-commerce environment are intertwined are:

Warehousing: E-commerce companies maintain a network of strategically located warehouses playing a critical role in storing products, picking and packing orders, and preparing them for shipment. Distribution logistics optimizes the layout and operations of these centers to reduce processing times and minimize shipping costs.

Last-Mile Delivery: The "last mile" refers to the final leg of the delivery process, from the distribution center to the customer's doorstep. This is often the most expensive and logistically challenging part of e-commerce. Distribution logistics streamlines last-mile delivery through route optimization, and various delivery options, including same-day and next-day delivery.

Inventory Management: Effective inventory management is crucial in e-commerce. Distribution logistics involves determining optimal inventory levels,

reorder points, and safety stock to ensure products are in stock when customers place orders. This prevents stockouts and overstocking, leading to cost savings.

2 Problem Definition

An e-commerce company that currently operates warehouses and sells goods online has a desire for strategic expansion by opening brick and mortar stores. The company wants the location of physical stores to be located at certain points near to the warehouses for efficient stock replenishment. For locals to visit a store, the store should be within a walking distance so that people in districts can have easy access to the stores and this is the only logistics requirement. The authorities especially would like increase access to the stores have determined some candidate locations for the stores.

Hence, the company aims to enhance its availability in the market which means increasing the accessibility of its stores and number of people visiting these stores.

3 Case Questions

Considering the logistics requirements, you are expected to find the best locations for the physical stores and do sensitivity analysis.

Question 1: Try to cover every district within a coverage radius while minimizing the number of opened stores. Analyze system based on coverage radius values including 2km, 3km, 4km, 5km and 6km. Where should you place the stores for each coverage radius?

Question 2: Try to cover as many people as you can within a coverage radius if you have a certain budget to open local test sites. Analyze system based on coverage radius values including 2km, 3km, 4km, 5km and 6km and assume that you can at most open 4 stores. Where should you place the stores for each coverage radius?

Question 3: If each district has to be reached within a coverage radius and you want to minimize total distance between the districts & stores, where should you place the stores? Analyze system based on coverage radius values including 3km, 4km, 5km and 6km and assume that you can at most open 4 stores.

About Grading:

- Report Format: 20%
  - Executive summary
  - Overall explanation and language
  - Clarity
- Quality of the workmanship: 40%
  - Stating the assumptions if any
  - Explanation of methodology and technique
- Quality of the solution: 40%
  - Correctness
  - Objective values