

# Simulation of Marketing Mix – Placement of Business

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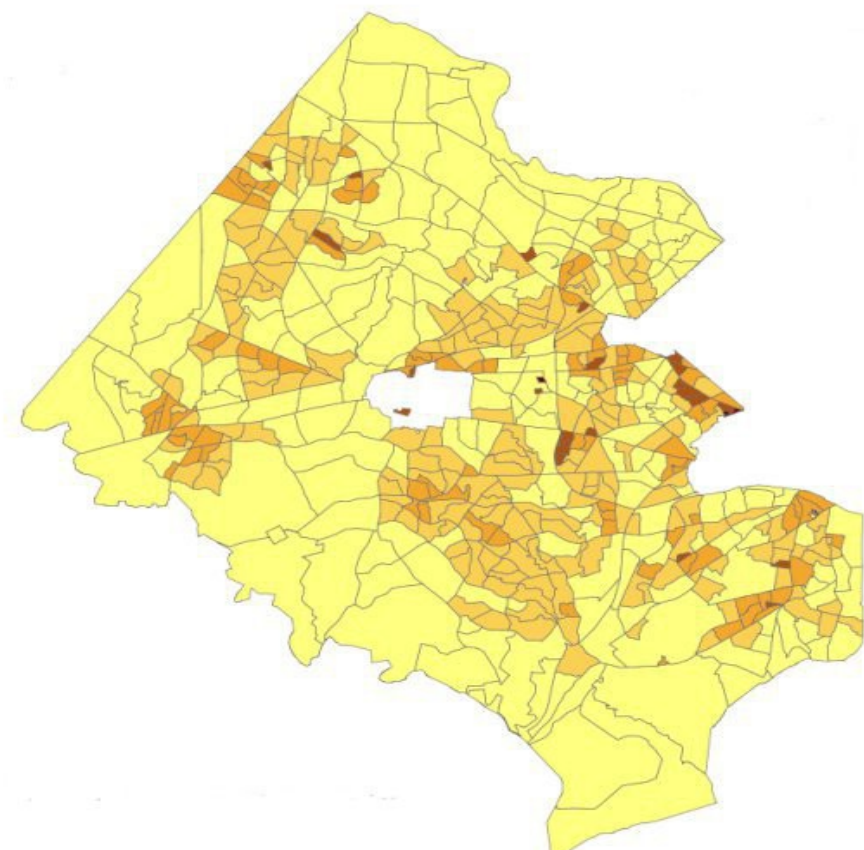
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## Abstract

Companies often face problems when seeking a way to transport goods/services to consumers. The strategy businesses use to solve such a problem is called the marketing mix. The purpose of this project is to find the optimal distribution channel based simply on a few variables such as population density and location of competition. The project will feature a GUI aspect created in Java to display the optimal location of a business. The optimal location will be found using a heuristic to evaluate possible locations.

## Introduction

One of the aspects of the marketing mix is the placement or location aspect. This aspect includes the physical location of the store. The program aims to focus on the physical location of a possible business to maximize profit and market share. A heuristic will be written to process variables such as population density and location of location competition.



Population density map of Fairfax County used as source of population density data

## Background

The research can be classified as a location problem. Location theory was first introduced in 1909 by Alfred Weber, when he tried solving a problem to minimize the total travel distance for his customers. My program expands upon this type of problem by incorporating the location of competition and possibly other aspects to create a more complex model that uses more variables. Finding the optimal location is currently done through professional advisors. The advisors take into account many variables of marketing mix and distribution channel such as location of the store, advertising, price, etc. Many programs have been written to model the process, although few have succeeded because of the many variables involved. Models tend to focus on the placement aspect of the marketing mix as it is the aspect that can be more easily measured quantitatively. The variables included in the placement aspect include population density, ease of access, and location of competition. A heuristic is then developed to evaluate the data and to find the optimal location, with the objective of maximizing market share and profitability.



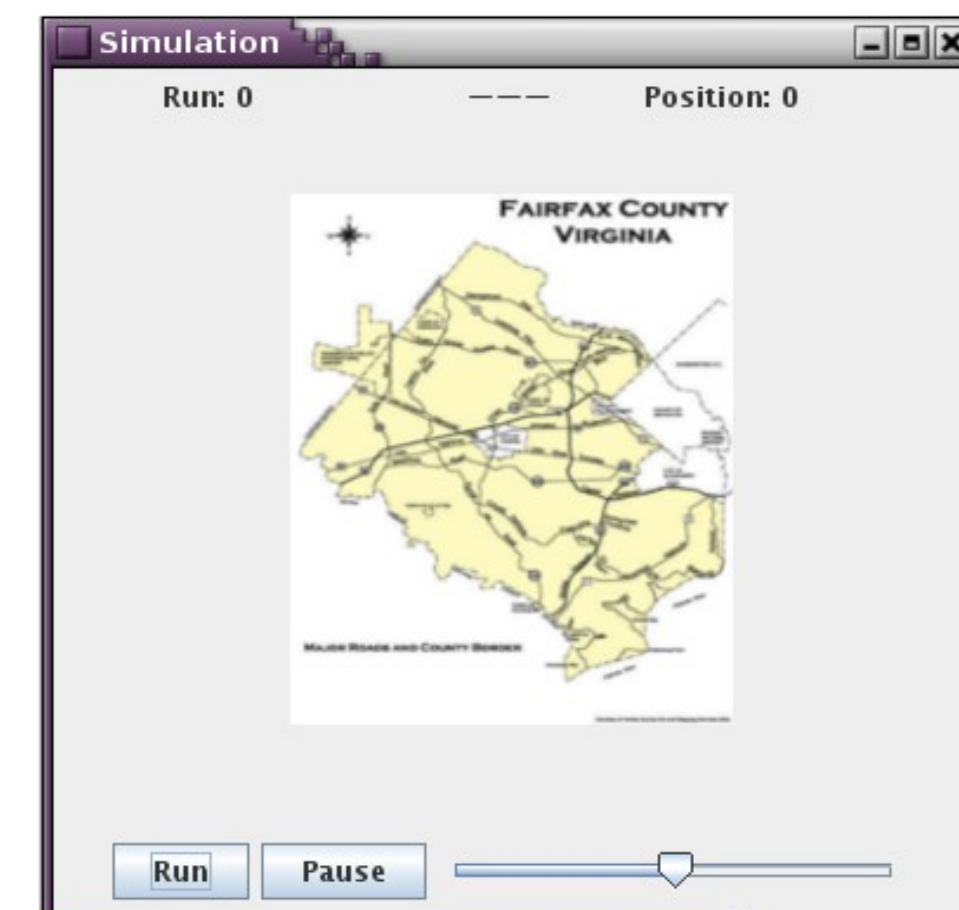
Fairfax County map with marked optimal point

## Developments

The model will be coded in Java with the occasional use of Python for various tasks. For example, Python is used to copy the data from a population density map into a usable text file. The program will include separate aspects including a GUI and a heuristic class to allow for easier editing. The GUI displays a map of Fairfax County (test region) and display the location of local competition along with the optimal location. A rating will also be given for possible business locations.

## Discussion of Results

The program can currently read in the text file with the population density and it includes this input in a basic heuristic based on clusters of dense spots. The optimal location once determined is marked on a PPM in blue as shown in the middle diagram.



Current GUI