

Dance Studio Placement in Atlanta, Georgia
An IBM Data Science Capstone Project

Kyle Hutchings*

March 24, 2020

*Contact at: kyle.sh.hutchings@gmail.com

Contents

1	Introduction	4
1.1	Background	4
1.2	The Business Problem	4
1.3	Interested Parties	6
2	Methodology	6
2.1	Data	6
2.1.1	Sources	6
2.1.2	Cleaning	6
2.2	Rough Analysis - Heat Map	6
2.3	Fine Analysis - Clustering	7

Abstract

A dance studio is a business which provides the service of dance lessons, most often for school-age children. They have unique challenges which can be mitigated by carefully considering where to locate one. This report details the use of data science techniques and freely available data to answer the question, “What is the best place to start a new dance studio?”

****Include more in the abstract section as results are found****

1 Introduction

1.1 Background

Dance studios are places where children, teenagers, and even adults can go to learn dance from qualified instructors. There are various kinds of dance studios that specialize in certain forms of dance like a ballet specific studio. Other studios may offer training in a variety of dance types and techniques.

Irrespective of the kind of dance focused on in the studio, a dance studio may choose to enter into dance competitions. Dance competitions are a means for studios to push their students to excel, they create a common goal and sense of loyalty among dancers, and winning competitions can boost a studio's reputation. However, because of costs, long practice hours, and logistics associated with competitions, studios may choose to forgo competitions and instead focus on recreational dance.

1.2 The Business Problem

Though the teaching and learning of dance is an athletic, artistic, and fulfilling endeavor, a dance studio is, at its heart, a business. Every business has unique challenges and needs, and dance studios are no exception. Dance studios face competition with other studios for students, student retention, finding qualified teachers, etc. These needs and challenges necessitate that a potential studio director carefully choose the location for their studio. A good location can help to minimize some of the common issues that studios face.

A somewhat hidden factor in the success of a dance studio is the commitment of parents. Parents need to be on board in order to insure students stick around, because they are likely paying for the lessons and providing transportation. Some locations may provide benefits for parents that will decrease the chances of students being pulled out of dance lessons. Among these "bonus" features could be close proximity to schools to minimize drive time for parents and as well as being located by shops or a grocery store so parents can run errands while their child is at dance.

A more complete list of issues and "bonus" features, explanations as to why they matter, and implications for a data science model, has been compiled in Table 1. This list was devised after an interview with a former dance studio Assistant-Director, so it is not a theoretical construct but a list of items that can make a significant impact on the success of dance studios. With all of these factors to consider, it may not be immediately obvious where the best place to start a new studio is. This report seeks to explore ways to determine the best location for a new dance studio using data science techniques. Put succinctly, this analysis will seek to answer the question, "What is the best location for a new dance studio?"

Issue/Bonus	Explanation	Model Implication
Competition with other studios	Two similar studios located too near each other could start competing for students which is usually a lose-lose for both studios. It's best to be farther away from other studios if possible.	Maximize distance from existing studios
Finding teachers	Finding qualified dance teachers can be made much easier by locating near a college or university. Often, such schools have dance majors or students who used to dance in studios themselves.	Proximity to colleges and universities
Student base	A dance studio needs a steady base of students. Most dance studios accept only students that are school-aged. Locating in an area near public schools insures there are plenty of potential students. It is also important to note that low-income families may not have the disposable income to sign their children up for dance lessons. Locating in an area with a higher average salaries and lower cost of living may increase student base.	Proximity to public schools; located in a more affluent area
Affordable performance venue	Recitals and performances give students a goal to work toward and help parents see the fruits of their financial and time investment. A recital can also help the studio raise funds, but that is only the case if the performance venue is relatively nearby and not too expensive to use.	Proximity to dedicated performance venues; colleges and universities
Student camaraderie	Building a sense of community helps students feel welcome and want to continue in dance. Having a place nearby to go grab a smoothie together after class can be a great way for students to spend time together outside of dance classes.	Proximity to cafes and restaurants
Parent convenience	Parents can have a lot of competing demands to balance. Locating a dance studio near public schools can help eliminate the need for a parent to pick their child up from school and drive across town to dance lessons. Locating the studio near to shops or a grocery store can allow parents to minimize the number of trips they make. They can get groceries or go out to eat while their child is at dance, and not have to worry about being late to pick their kid up.	Proximity to public schools, Proximity to grocery stores, restaurants, and other shops.

Table 1: A list of needs and bonus features, explanations about them, and implications they have on a data science model.

1.3 Interested Parties

This report is targeted to any person or persons interested in starting a dance studio. The results may be more optimal for those seeking to run a recreational dance studio, as competition studios may have additional needs that are not be considered here. Given that the author lives in Atlanta, Georgia, this report will focus on the greater Atlanta metropolitan area. Even with the previous constraints, any current or potential studio directors in any area may glean insights from this report.

2 Methodology

2.1 Data

2.1.1 Sources

To answer the question, “What is the best location for a new dance studio?”, first necessary data must be collected. Due to the nature of the problem, the majority of the data needed will be location data. Location data including features from Table 1 will be the main kind of data utilized. Data sources are:

- Foursquare API – Existing dance studios, performance venues, cafes, grocery stores
- National Center for Education Statistics – Locations of public and private schools

2.1.2 Cleaning

The Foursquare API contains information about venues in a given locality. Foursquare has done a very thorough job categorizing venues, which makes it useful for a broad range of analyses. However, that also means there are many unnecessary categories for this analysis which can be left out. Irrelevant categories will be deleted, and only categories relevant to features in Table 1 will be included. The Foursquare data lists venues within neighborhoods, so that data will be much more workable if one-hot encoded.

2.2 Rough Analysis - Heat Map

The scope of the geographical area for dance studios will be limited to a 10 mile radius around downtown Atlanta. This insures a high population density, and thus a high potential student base. The aim of this report is to find locations for dance studios that will be mutually beneficial for parents, students, the studio owner, and studio staff. Based on the features discussed in Table 1, potential locations will be identified based on the following constraints (in order of priority):

1. A minimum 1.5 miles away from other existing dance studios
2. Within 5 miles of at least 2 public or private schools

3. Within 8 miles of a college or university
4. Within 2 miles of a grocery store

In order to make it easier to zero in on potential areas, a heat map will be generated. Each of the features will have a different temperature value based on priority. For this heat map, a hot area will represent a good potential area for a studio.

2.3 Fine Analysis - Clustering

Lastly, those larger candidate areas identified by the heat mapping will be clustered using k-means clustering, which will help to further narrow down ideal locations to a neighborhood level. At that point, a potential studio owner would then likely need to make decisions based on available spaces and other factors which are beyond the scope of this report.