Cap Stone Project Proposal

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As part of the Springboard Foundations of Data Science course I am enrolled it, I will be completing a Cap Stone Project that demonstrates my competence with the data science process and some of its tools. Below are three possible projects that I am considering.

# Underserved Market Segments in Higher Education

## Background

I am a founder and Chief Operating Officer of a marketing company that operates in the post-secondary education space. My company uses internet based marketing tactics and contact centers to generate inquiries (leads) for post-secondary schools’ enrollment departments. In spite of the fact that we work with more than 800 post-secondary institutions, we still work with many potential students that we cannot match to a school. I would like to use data science to understand some of the patterns at play here. For instance, are these would-be students located in certain parts of the country? Are they interested in certain types of degree programs? Do they come from a particular age group or background? Or are our school clients simply over saturated with potential inquiries?

## Dataset

The data set I will use to answer these questions is my company’s proprietary data. We have saved millions of individual search records and can cross reference these records with the specific school results (if any) that were returned for search. For this study my focus will be on those searches that received no school results.

## Benefit

Identifying underserved market segments in this sector has several potential benefits to my organization. First, we may find patterns that suggest the addition of new lead buyers that we can recruit to fill gaps in our coverage. Additionally, we might find patterns that suggest new markets for our existing school clients to target. Finally, we may find new potential buyers of post-secondary education that are simply unserved by the marketplace as a whole. This discovery could fuel development of new courses or even modalities for serving these markets.

# Regional Job Demand and Alignment with Post-Secondary Graduates

## Background

The role of the post-secondary education space within our economy is to prepare students for careers after they graduate. This idea is the motivation behind government funding of education programs. Without a properly education workforce, jobs that need to get done cannot get done. Said another way, there is an economy way of looking at educated individuals. Schools provide the supply and industry/employers provide the demand. Like any other marketplace, efficiency is found when supply and demand are in alignment. I would like to use data science to understand the demand for properly educated graduates and how it might or might not align with the supply.

## Dataset

The US Bureau of Labor Statistics makes several databases available. This one, <http://www.bls.gov/oes/#tables>, indexes employment by industry in metropolitan areas. This one, <http://www.bls.gov/jlt/jltnaics.htm>, shows estimated job openings by sector. Either or both of these data sets can be helpful in understanding demand for employable individuals in certain industries and regions.

My company’s proprietary database contains data about the types of programs that individuals are interested in studying as well as the specific degree programs students have enrolled for or are currently pursuing. This data set should be useful to estimate the supply of employable individuals in certain industries and regions.

## Benefit

Understanding the alignment (or lack thereof) between the types of careers schools are preparing students for and the types of careers that are actually available can help us to understand how successful the post-secondary education space is at fulfilling its role in our economy. Discovering sectors where supply and demand are out of alignment could drive the creation of new programs to help fill these job openings.

# Phoenix Real Estate Market Analysis

## Background

Over the years, my wife and I have considered the idea of starting a business buying real estate, making improvements and either selling the properties or offering them up for rent. We are both Phoenix natives and know the various districts and neighborhoods of the metro area relatively well. However, we have little background in the real estate market aside from the homes we have purchased to live in. I would like to use data science to get a better understanding of the real estate marketplace in the greater Phoenix area. What neighborhoods seem to be on the rise either from an inventory perspective, a sales perspective or a pricing perspective? What price ranges are Phoenix home buyers purchasing homes in? What patterns in location and pricing drive the number of days a home stays on the market before it is purchased?

## Dataset

The Arizona Regional Multiple Listing Service (ARMLS) makes a number of datasets available (<http://www.armls.com/statistics/market-reports>) that could be leveraged to answer these questions. Additionally, data retrieved from Zillow.com and/or Trulia.com and other home search websites could prove valuable for this investigation.

## Benefit

Understanding the real estate marketplace in the Phoenix area could help my wife and I determine where to focus our search for investment properties (what neighborhoods, price points, etc). It can also help us to understand the potential for profit of a particular property either from rental income or income from a sale.