Data Analytics Capstone Topic Approval Form

The capstone challenges students to integrate skills and knowledge from several program domains into one project. The guidelines for this capstone course require you to demonstrate the application of academic and professional abilities developed as an undergraduate student in the BSDA program. It is highly recommended that the topic of your capstone be about resolving a current or perceived business problem. Your research topic should exemplify scholarship and research at the highest level and should be significant enough that it would help potential employers identify your abilities. It is also recommended that you use publicly available datasets for transparency and external validity.

This document is designed to help you clearly state the research question you will be exploring in your capstone project, the scope of your project, and your timeline in order to ensure that all of these align with your degree emphasis. Without clearly defining each of these areas, you will not have a complete and realistic overview of your project, and it cannot be accurately assessed whether your project will be acceptable for this capstone course.

If your project is one you have already completed at work or elsewhere, this document should be easy to complete. Many students do use a project they have already completed in the past. In that case, you will write the proposal as if the project has not been completed yet, and when you report on your project, you will use your complete after-implementation report. If you have not yet completed your project, this document can help ensure the scope is within the acceptable range for this capstone. An instructor must approve this form before you submit this task for evaluation. The task will not be evaluated without an instructor's signature. The instructor may ask for additional information before approving this form.

==*Before submitting this form for approval, please remove all italicized directions in the form.*== **Please only submit a Topic Approval Form that has been signed by a course instructor for evaluation.**

Capstone Topic Approval Form

The purpose of this document is to help you clearly explain your capstone topic, project scope, and timeline. Identify each of the following areas so you will have a complete and realistic overview of your project. Your course instructor cannot approve your project topic without this information.

Note: You must fill out and submit this form. Space within each section will expand as needed.

Any costs associated with the development of the data analytics solution will be the responsibility of the student.

Student Name: JDee Warren

Student ID: 001463291

Capstone Project Name: Utah Single Family Residence Median Sales and Future Median Sales Projections

Project Topic: The project will use Zillow.com's housing data to analyze median sales data for the state of Utah and determine if the median sales price for single-family residences will increase or decrease for upcoming quarters.

Research Question: *Summarize one question or decision you will answer by collecting and analyzing a set of data.* Determine if future single-family residence median sales price will increase or decrease over the next 4 quarters based on the past 10 years of sales.

> **Hypothesis:** Based on the 10 years of data provided, the future projections for Utah show that the median sales values will continue to increase over the next four quarters (barring any economic shifts or major interest rate changes).

Context: *Explain in 500 words or less why the situation or question would benefit from data analysis.* This will allow a real estate agency to determine a marketing strategy for the next several quarters. If sale prices for single-family residences are increasing, they can focus on marketing to buyers that by buying now, they can have more equity in the homes within months of purchasing. The agencies can adjust marketing to show a buyer's market if the median sales price declines.

Data: *Identify data you will need to collect that are relevant to the situation or question.* The data collected will be provided by zillow's housing data. The data collected represents median sales totals for single-family properties across the United States. The data can be found at https://www.zillow.com/research/data/ under Sales and is updated monthly with then newest figures.

> *If an existing dataset will be used, describe the dataset. The data contains 757 records. Columns include: RegionID, SizeRank, RegionName, RegionType, StateName, and column date ranges from 02/29/2008 through 05/31/2024 (new data is added at the end of every month). The dates provide median home sale values for Single-Family Residences (SFR) for each RegionID.*

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Explain who owns the data and why you are allowed to use the data for your capstone project. The data is owned by Zillow and is made free to the public. https://www.zillowgroup.com/developers/api/public-data/real-estate-metrics/

Note: If you are using restricted information, please have the "Authorization to Use Restricted Information" form signed by an authorized agent on behalf of the data owner. The data owner's legal name is required on the form.

Data Gathering: *Describe the data-gathering methodology you will use to collect data.* The data is downloaded from Zillow's Housing Data site https://www.zillow.com/research/data/. Under the "sales" section, there is a dropdown menu with various selections. Select "Median Sales Price (Raw, SFR only, Monthly). In the next drop box, select "Metro & U.S.". A .csv file is then generated with the applicable data.

Data Analytics Tools and Techniques: *Identify the appropriate data-analysis technique you will use to analyze the data.* To analyze the data, I will use Jupyter Notebook (coding in Python) to generate the code and applicable graphs and/or charts necessary.

Justification of Tools/Techniques: *Explain why the data-analysis technique you chose is an appropriate technique to analyze the data collected*. Jupyter Notebooks will allow me to track and monitor my code and changes while leveraging data analysis tools needed including predictive analysis.

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Application Type, if applicable (select one):

        ☐ mobile
        ☒ web
        ☐ stand-alone

Programming/Development Language(s), if applicable: Python

Operating System(s)/Platform(s), if applicable: Windows

Database Management System, if applicable: N/A

Project Outcomes: *List the key anticipated project outcomes and deliverables in fewer than 500 words*. The project's primary outcome is to detail what future median sales projections will be for the next four quarters. The data should allow the agencies to make educated decisions on future marketing plans. The data, graphs, and charts should be made to cater to all audiences and be easily interpreted. Once all shareholders are comfortable with the output, regular reporting should be put in place to generate this data on a monthly basis and continue providing real-time information.

Projected Project End Date: 9/10/2024

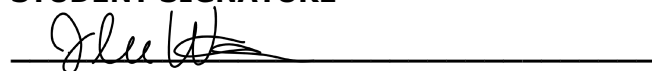**Sources:** https://www.zillow.com/research/data/

Human Subjects or Proprietary Information
Does your project involve the potential use of human subjects? (Y/N): N
Does your project involve the potential use of proprietary company information? (Y/N): N

STUDENT SIGNATURE

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By signing and submitting this form, you acknowledge that any cost associated with the development and execution of your data analytics solution will be your (the student) responsibility.

TO BE COMPLETED BY AN INSTRUCTOR

The capstone topic is approved by an instructor.

INSTRUCTOR'S NAME AND SIGNATURE:

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INSTRUCTOR APPROVAL DATE: 8/7/2024

Project Compliance with IRB (Y/N):   Y