**Final Assignment - Segmentation and Profiling Project:**

**Course Information**

Course Title: Applications of Artificial Intelligence

Course Number EAI6010

Term and Year: Fall Part B:

Start and End Dates: March 2 - April 11

**Segmentation and Profiling Project:**

Your task is to analyze the Customer Database dataset which is provided in Module 6 / 7. Assume that you are a marketing manager for a telecommunications company, and you have been tasked with developing customer segmentation that can support effective, and economically sound, customer retention efforts. To accomplish that goal, you need to take the following data analytical steps:

* Carefully review all available data (i.e., the contents of Customer Database), paying particular attention to distinct data types (e.g., product purchases, demographics, etc.), and identify specific variables that you would like to use as the basis of your segmentation analysis. It is important to be able to justify your choice(s)
* Select a data segmentation technique (e.g., K-Mean Cluster) and segment your customer base
* Evaluate the statistical and practical efficacy of your segmentation solution
* Group all customers into the created segments
* Provide a detailed overview (i.e., the number of segments, cross-segment differences, segment-specific profiles, etc.) of the selected segmentation results, expressly differentiating between ‘high’ and ‘low’ value segments; make sure to provide sound justification for why you consider some segments to be ‘high value’ while others to be ‘low value’
* Design and describe explicit customer retention recommendations, based on the results and conclusions arrived at your earlier analytical steps. More specifically, review the value (to the company) of the individual customer segments, singling out those you deem to be most valuable and retention worthy, and provide a clear justification of your choices and/or reasoning.
* **You will be provided with extensive and detailed coding examples in R and Python for most of the above tasks.**
* **Your task is to examine the dataset, implement a detailed exploratory data analysis, and select themes or hypotheses based on your findings that you want to use as drivers for your segment solution. You need to independently select the segment driver and arrive at a solution. This process may be iterative, and you have to work on multiple sets of drivers to arrive at an acceptable solution that differentiates the segments in terms of size, needs, attitudes, and behaviors. You should all use a 5-segment solution to make the problem simpler.**

Content-wise, your report needs to include the following elements:

* Executive Summary: 2-3-page summary of your key findings and recommendations
* Segmentation solution selection logic: Description of the rationale you use to select the specific segmentation solution.
* Detailed findings (i.e., detailed customer profiles of individual segments): Descriptions of the individual customer segments.
* Appendix: Any additional details such as tables, charts, or figures that you found worthwhile but did not include in other sections.

Format-wise, your report needs to be structured as follows:

* Length: No more than 10 single-spaced pages (excluding any appendices)
* Use Times New Roman, 12-pt font throughout.
* Use clear headings, as appropriate.
* Small blocks of code are acceptable in the main body of text when they improve clarity. Large blocks of code should not be included in the main body of text, include them in the appendices instead.
* Output tables should be cleanly formatted and easy to read. Do not copy and paste directly from console output for which you will be penalized.

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Shivangi Vashi

Winter 2021

7 April, 2021

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Introduction

This week we are given the customer dataset to explore customer segmentation techniques via clustering algorithms such as kmeans.

Executive Summary

Segmentation solution selection

Detailed appendix