**CSCE 5290: Natural Language Processing**

**Project Proposal**

**Customer Segmentation**

1. **Project Title and Team Members**

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| **Team Members** |
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**2. Goals and Objectives:**

**Motivation:**

There are numerous reasons for conducting a E- commerce customers Segmentation project. Some of them are listed below**.**

1. Businesses can adjust marketing messages and promotions to the preferences and needs of each segment by segmenting clients based on their purchase behavior (quantity, invoice
2. amount, frequency).
3. Understanding the country or region of clients can aid in identifying international expansion prospects or the necessity for regionalized marketing strategies.
4. Analyzing stock code descriptions and quantity purchased can help firms optimize their stock levels by identifying fast-moving and slow-moving products.
5. Recognizing client IDs and purchasing histories enables firms to identify and reward loyal consumers through customized loyalty programs or incentives.
6. Segmentation can help identify at-risk consumers (e.g., those who haven't purchased in a while) so that retention efforts to prevent churn can be applied.
7. Businesses can focus on high CLV segments and prioritize efforts to maximize the value of these customer relationships by segmenting customers.
8. client segmentation may provide businesses with insights into the individual needs and preferences of various client segments, allowing them to improve the overall customer experience.
9. Make data-driven decisions based on insights from the dataset, such as product assortment planning, marketing budget allocation, and expansion strategies.

**Significance:**

1. Customer segmentation have high significance for businesses to  understand and service their consumers, optimize marketing and resource allocation, and ultimately achieve their business objectives. It helps firms to abandon one-size-fits-all practices in favor of more customer-centric and data-driven initiatives.
2. client segmentation enables firms to build marketing messages and campaigns that are personalized to certain client segments. Personalization boosts the relevancy of marketing efforts, resulting in increased response and conversion rates.
3. Businesses may offer a more tailored and enjoyable customer experience by being aware of the particular requirements and preferences of various consumer segments. Increased client loyalty and retention may result from this.
4. Businesses can set themselves apart from rivals through effective segmentation by providing special value propositions and specialized solutions to certain consumer segments.
5. By locating underserved or untapped client categories that are compatible with their offers, businesses can find new market opportunities, which may result in business expansion.

**Objectives :**

1. The main objectives for E- commerce Customer Segmentation is we deeply analyize the description part of the customer and their choice of buying.
2. We analyze the description with stop word technique to check each word and analyze the product they are looking.
3. Upon analyzing the text we can send the recommendations to their communities.
4. To represent text data as dense vectors, use word embeddings (e.g., Word2Vec, GloVe). These vector representations can then be used for clustering or classification.
5. Customer personas should be created based on the content and language used in customer interactions. This entails building fictitious representations of typical customers within segments, taking into account their objectives, pain spots, and preferences.

**Features :**

Features we have used in E- commerce customer segmentation are Invoice no, Stock code,Description,Quantity,Invoice Date,Unit Price, Customer ID,country. Natural Language Processing (NLP) approaches are extremely important in consumer segmentation. Businesses use numerous NLP methodologies to properly categorize and understand their clients. To begin, text classification models are trained to categorize customer reviews, product descriptions, or comments into predetermined groups, allowing for segmentation based on interests and purchase intent. Another useful technique is sentiment analysis, which allows firms to assess consumer happiness and categorize customers accordingly. Furthermore, topic modeling can discover common patterns in customer comments and product descriptions, leading interest-based segmentation. Keyword extraction reveals essential phrases, assisting in product affinity and sentiment segmentation.

Technologies Used: Python, Matplotlib,Seaborn,NLP Library Natural language tool kit, Stop words, Bag of words concept.

**References:**

<https://www.kaggle.com/code/fabiendaniel/customer-segmentation>

<https://www.zendesk.com/blog/customer-segmentation/>

<https://r.search.yahoo.com/_ylt=Awrx_Lg8mgtlLqkDKhG7HAx.;_ylu=Y29sbwNzZzMEcG9zAzIEdnRpZAMEc2VjA3Ny/RV=2/RE=1695287996/RO=10/RU=https%3a%2f%2fprofiletree.com%2fcustomer-segmentation%2f/RK=2/RS=cUuHnzJDBFIauqM.71D5i3FFkps->

**Github Link:**