In today's society, the emphasis on convenience and speed has led to the widespread integration of credit card services by banks. Credit cards have become an indispensable part of modern life, offering users a sense of security and the flexibility to make convenient and quick payments anywhere, anytime, without the need for carrying large amounts of cash.

As the number of credit card users increases, complexities arise. Frequent users contribute significant value to banks through fees, interest, revenue, and customer data. However, occasional users pose challenges for banks to tailor credit limits and services to diverse customer groups effectively. To address this, our research topic is "Customer Segmentation Based on Credit Card Usage."

This research aims to categorize customers into distinct groups, allowing for clear identification of customer characteristics, patterns, trends, and charts to support business decisions. Additionally, exploring data clustering opens opportunities to apply machine learning techniques, data mining, and optimization for more efficient business processes and the development of financially effective products and services.

Our fundamental question revolves around how to classify customers into groups based on factors such as usage frequency, spending limits, common transaction types, and various payment behaviors. We seek to build a detailed customer database to enhance the bank's understanding of optimizing services and policies to meet the unique needs of each customer segment.

To achieve this, our team has chosen to implement the KMeans clustering algorithm, a method where we develop the algorithm from scratch without relying on pre-built libraries. This hands-on approach allows us to have greater control over the clustering process and gain a deeper understanding of the underlying mechanisms. We believe that by customizing the algorithm, we can extract more meaningful insights from the credit card usage data.

Utilizing the KMeans algorithm for clustering, our group aims to create meaningful clusters. We anticipate that this bespoke implementation will provide valuable insights into customer segmentation, enhancing the bank's decision-making ability regarding flexible and efficient customer service strategies.

Our research not only aims to understand customers better but also seeks to optimize business processes by using classified information to formulate flexible and effective business strategies. Simultaneously, it opens avenues for developing new financial products and services tailored to the specific needs of each customer segment.