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Title: Mall Customers Segmentation

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1) Problem Statement

The Project is based on Customer segmentation. Customer segmentation is the process of dividing customers into groups based on common characteristics so that companies target each group effectively and appropriately.

The manager of the XYZ mall has approached us with this data where he has tried gathering some details regarding the customers who visit the mall. The given dataset is a simple spreadsheet where you can see columns like customer ID, gender of the customer, age of the customer, the annual income of the customer given to us in thousand dollars and the spending score which ranges from 1 to 100. The gender, age, and annual income was gathered through a feedback survey and the spending score was calculated by the manager on the basis of several factors like how often does the customer visit the mall, how much of amount does he spend on shopping and also on entertainment and food. Based on this, from the manager's perspective, a good spending score which is close to 100 indicates a good customer and spending score close to 1 indicates a bad customer.

Now the manager has come up to us with this data saying that he has an offer in his mind which he wants to roll out to specific customers by personally calling them. So the manager wants to find out the potential customers in order to call only those specific customers and roll out the offer to them.

You are required to work upon this data and find out the optimum number of segments that can be generated, segment the customers and help the manager with the potential customers.

2) Customer Segmantation:

Customer segmentation analysis is the process performed when looking to discover insights that define specific segments of customers. Marketers and brands leverage this process to determine what campaigns, offers, or products to leverage when communicating with specific segments.

For example, a retail brand looking to determine how to reactivate lapsed customers might create a segment of customers who purchased in the past and haven't purchased or browsed the eCommerce store in the past 30 days. It might then analyze that segment to understand what type of products these customers have purchased in the past, what is their discount affinity and more. Using this information, the marketing team can determine the best campaign to create in order to reactivate these lapsed customers.

Similarly, a company can use customer segmentation analysis to determine the value of certain segments by analyzing a segments predicted Future Value, average order value, loyalty tier distribution, and more.

3) KMeans Clustering:

K-Means Clustering is an unsupervised learning algorithm that is used to solve the clustering problems in machine learning or data science. It is an algorithm that groups the unlabbled dataset into different types of clusters.

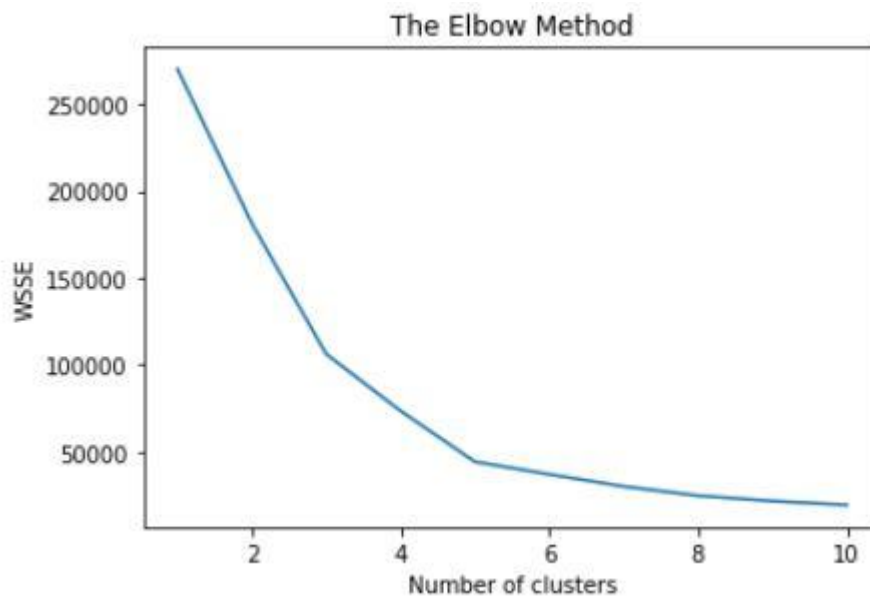
4) Aim of the Project:

The aim of this project is to target the customers who earn at a very good rate and also have a good sending ratio,so that the manager can give them a call and provide them with some good offers so that they can visit there mall frequently.

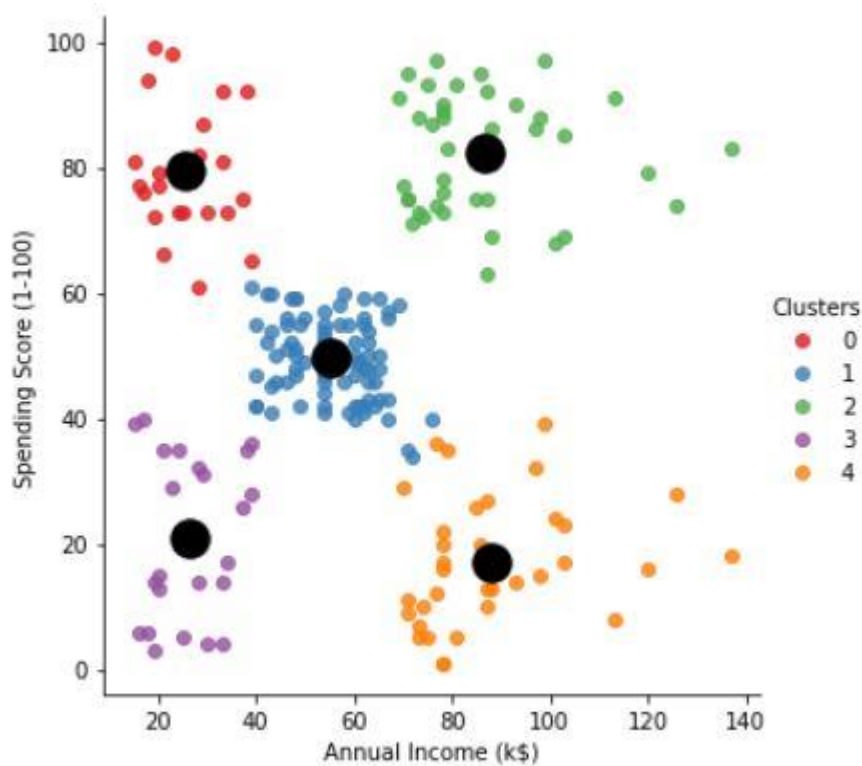
5) Steps involved in the project:

1. Importing the required libraries
2. Reading the dataframe
3. Select k data points as the initial cluster centres.
4. Find the euclidean distance of each data point towards each cluster centres
5. Assign each data point to the nearest cluster.
6. Recompute the new cluster centres by taking mean of the data points belonging to that cluster.
7. Repeat step 2 to 4.
8. Stop the process when zero convergence is reached.

6) Diagram For Finding out the optimum value for K(Elbow Method)



7) Customers Segmentation through clusters diagram



The above image shows the cluster of points where each colour determines different cluster based on there spending score.

The clusters are rated from 0-4 where each number has different specifications as follows:

- 0: Careless
- 1: Standard
- 2: Target
- 3: Sensible
- 4: Carefull

The green colour cluster points that hold cluster number 2 are the targeted customers, to whom the manager can give a call and provide them with some offers.