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Customer Segmentation Using Online Approach

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ABSTRACT

We have applied unsupervised learning, using three different algorithms to compare and implement the best algorithm according to prediction results .

We have also tried to implement an online learning model which can update itself and learn with time. We have tried to apply reinforcement learning in an clustering algorithm.

INTRODUCTION

- Customer segmentation is the practice of dividing a company's customers into groups that reflect similarity among customers in each group.
- The goal of segmenting customers is to decide how to relate to customers in each segment in order to maximize the value of each customer to the business.
- Accurate customer segmentation allows marketers to engage with each customer in the most effective way.

The opportunities to segment are endless and depend mainly on how much customer data you have at your use. Starting from the basic criteria, like gender, hobby, or age, it goes all the way to things like "time spent of website X" or "time since user opened our app".
There are different methodologies for customer segmentation, and they depend on four types of parameters:

- geographic,
- demographic,
- behavioral,
- psychological.

MODULES AND METHODS

- For this project, we will be going to use unsupervised learning to group your customers into clusters based on individual aspects such as age, gender, region, interests, and so on.
- K-means clustering or hierarchical clustering will be then applied with the following steps:
  a. Business Care
  b. Data Preparation
  c. Segmentation with K-means Clustering
  d. Hyperparameter Tuning
- The Python Libraries we will be using are:
  1.Pandas
  2.Numpy
  3.sklearn.cluster (import K-means)
  4.matplotlib
  5.sklearn.preprocessing (import StandardScaler, Normalize)
  6.sklearn.decomposition (import PCA)
  7.sklearn.clustering (import spectral clustering)

RESULTS

We have used 3 algorithms in total and choose the algorithm which is gives the best output

The first three algorithms that we used are K-means, nearest neighbour spectral clustering and rbf spectral clustering

At last we tried to make and implement our own model using online clustering algorithm from K-Means which can learn in real world to improve clusters.

It takes in the data recorded by application and update the algorithm for every set of 50 records our updating algorithm get.

We retrained data due to lack of research in this area in place of updating data with the datasets already available. More like forming a pseudo-online algorithm.

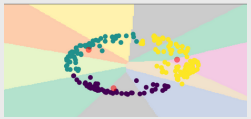

FIG 1: K-Means Clustering

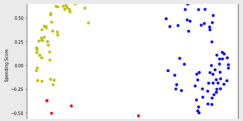

FIG 2: SPECTRAL CLUSTERING NEIGHBOUR

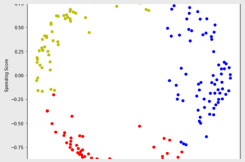

FIG 3 : SPECTRAL RBF

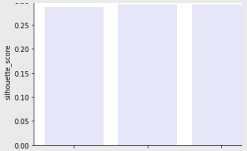

FIG 4: COMPARISONS

DISCUSSION

- With the coming of shows like Shark Tank , the spirit of entrepreneurship grew among the youths of the country . But one of the many problems faced by any startup is to know the market segment the product caters to . Knowing the customer market holds the difference between failure and success.
- But as we all know that at the begging the funding is low and a new startup cant invest in people involved in marketing of the product or in professional people who can find more about the market current trend.
- What our team has provided is a cheap and easy way for the business to cater and find out more about the market segment the product caters to without using physical labour ,
- Our Machine Learning Model will utilize the technique of Unsupervised Machine Learning which will find clusters or groups from the unlabelled set of data that we have collected from various google forms.

CONCLUSIONS

Implementing customer segmentation leads to plenty of new business opportunities in budgeting , product design, marketing and knowing the right customer for the right Product.
By using our model a thriving business can optimize its operations and marketing capability in small budget

REFERENCES

1. https://towardsdatascience.com/customer-segmentation-in-python-9c15acf6f945
2. https://neptune.ai/blog/customer-segmentation-using-machine-learning
3. https://www.natasshaselvaraj.com/customer-segmentation-with-python/