Data Mining Final Project

Team MAD

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1 Online Shoppers Intention Dataset

1.1 Description

1.1.1 Dataset

The dataset consists of feature vectors belonging to 12,330 sessions. The dataset was formed so that each session would belong to a different user in a 1-year period to avoidany tendency to a specific campaign, special day, user profile, or period.

Dataset has taken from UCI Archive.

1.1.2 Features

Administrative: This is the number of pages of this type (administrative) that the user visited.
Administrative-Duration: This is the amount of time spent in this category of pages.
Informational: This is the number of pages of this type (informational) that the user visited.
Informational-Duration: This is the amount of time spent in this category of pages.
ProductRelated: This is the number of pages of this type (product related) that the user visited.
ProductRelated-Duration: This is the amount of time spent in this category of pages.
BounceRates: The percentage of visitors who enter the website through that page and exit without triggering any additional tasks. ExitRates: The percentage of pageviews on the website that end at that specific page.
PageValues: The average value of the page averaged over the value of the target page and/or the completion of an eCommerce
SpecialDay: This value represents the closeness of the browsing date to special days or holidays (eg Mother's Day or Valentine's day) in
Month: Contains the month the pageview occurred, in string form.
OperatingSystems: An integer value representing the operating system that the user was on when viewing the page.
Browser: An integer value representing the browser that the user was using to view the page.
Region: An integer value representing which region the user is located in.
TrafficType: An integer value representing what type of traffic the user is categorized into.
VisitorType: A string representing whether a visitor is New Visitor, Returning Visitor, or Other.
Weekend: A boolean representing whether the session is on a weekend.
Revenue: A boolean representing whether or not the user completed the purchase.

1.1.3 Researchers

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1.2 Our Aim on The Dataset

1.2.1 Explotary Data Analysis

First of all, we want to get more information about the dataset to be more succesful for the other steps. Also, in this step will show us that is there a missing or an unnecessary data or not. Having these kind of datas prevents our models giving more accurate results.

1.2.2 Classification

Online Shoppers Dataset give us the some features which i show it on 1.1.2 and the item sold or not sold. So, basicly we can guess the sold or not with the features. The guessing provides us for the new sessions will buy the item or will not buy it. This can be important information for e-commerce companies with getting similar features from their costumers. For this step, we will use 3 different classification algorithms.

1.2.3 Clustering

Our other aim is clustering. We will apply pca for the features to dimension reduction to 2d or 3d. After that, we want to cluster them on plot. It show us how these customers' behavior differ.

1.3 Tasks

1.3.1 Explotary Data Analysis(EDA)

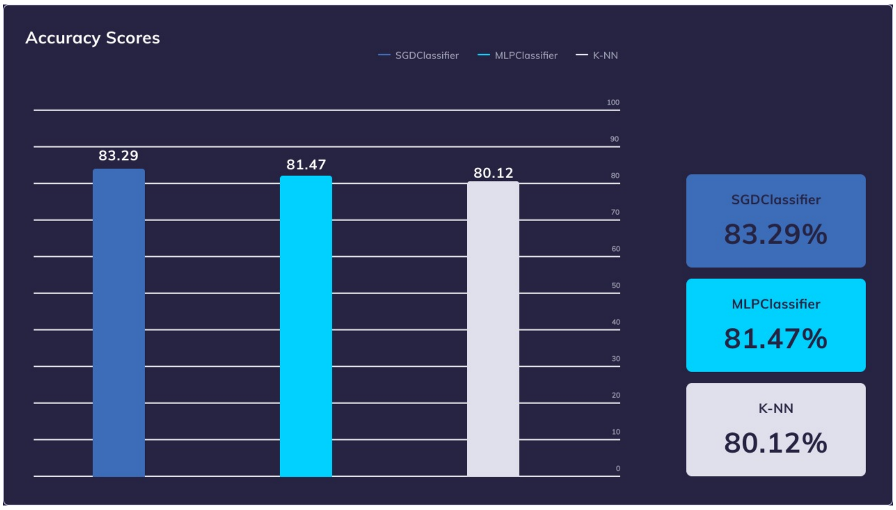
There was no any null-missing data in our dataset but there was same data which are effect our models in future. Our dataset problems are:

1. Some features are integer type which should be category type.
2. Some features are unnecessary to guess the revenue. For example, we dont think the browser which we use, will not help us to guess it.
3. There was ten different month, the data's number of six of them are insufficient.
4. On Administrative and Administrative Duration features includes zero value. This is really meaningless because to buy or not the item, you have to click its page. You cant buy without clicking it.
5. As a last, there was outliers for Durations. The customer could be click the page and could forget he/she is on page.

1.3.2 Classification

In classification step, we have choosen sgdclassifier, mlpclassifier and k-NN for classification algorithms.

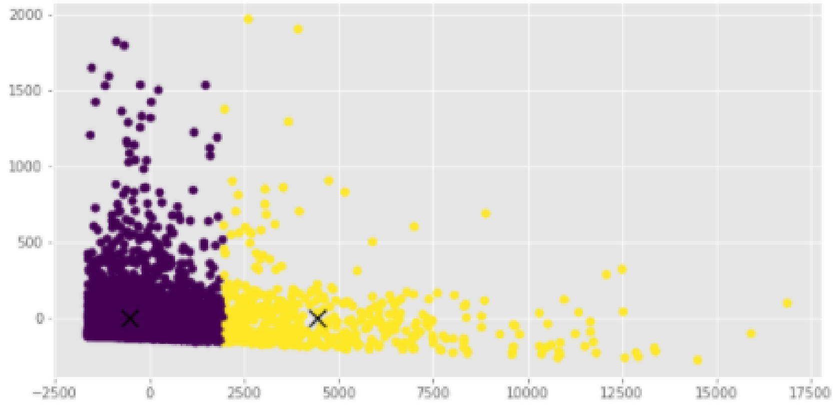
Accuracy Scores:
SGDClassifier: 83.29
MLPClassifier: 81.47
k-NN: 80.12



Accuracy Scores

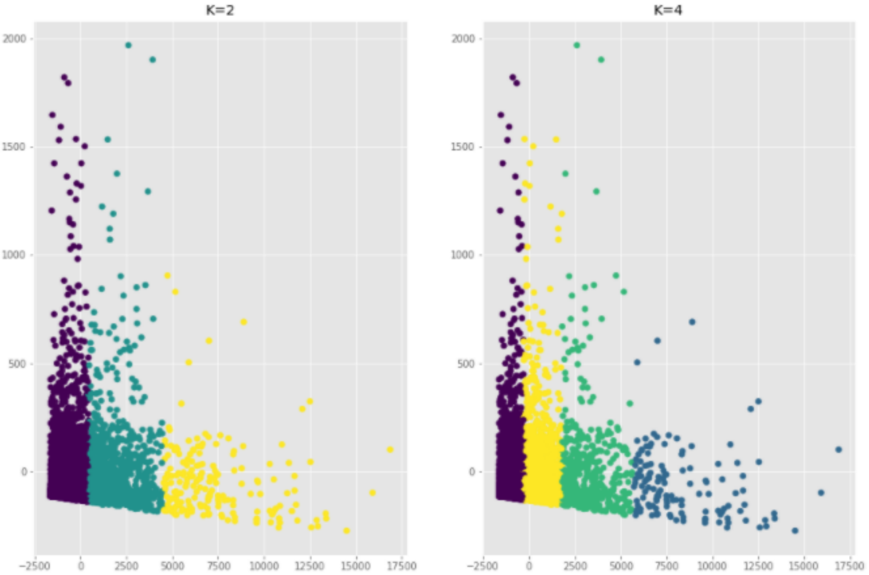
1.3.3 Clustering

Before clustering, we've used PCA to dimension reduction to 2d looking their explained ratio. After that, We've applied K-means with Optimum K.



K-means with K equal to 2

K-means with Different K Values



K-means with K equal to 3 and 4

1.3.4 Chapter Conclusion

Conclusion here