Review Rating Prediction

Submitted by:

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ACKNOWLEDGMENT

I would like to express my special thanks to flip robo technlogies for given me such a wonderfull of apportunity to explore and insite work on a data science projects.

And and also thanks to Datatraiend institute's mentors to motivate and understand the concepts of Data science. I have got lot of help from their resourses and concept to complete these project.

Link that helps me to complete this project

https://scikit-learn.org/stable/modules/generated/sklearn.neighbors.KNeighborsClassifier.html

https://scikit-learn.org/stable/modules/generated/sklearn.tree.DecisionTreeClassifier.html

https://scikit-learn.org/stable/modules/generated/sklearn.linear_model.LogisticRegression.html

https://scikit-learn.org/stable/modules/generated/sklearn.svm.SVR.html

https://scikit-learn.org/stable/modules/generated/sklearn.pipeline.Pipeline.html

INTRODUCTION

- ## Business Problem Framing

  We have a client who has a website where people write different reviews for technical

  products. Now they are adding a new feature to their website i.e. The reviewer will have to

  add stars(rating) as well with the review. The rating is out 5 stars and it only has 5 options

  available 1 star, 2 stars, 3 stars, 4 stars, 5 stars. Now they want to predict ratings for the

  reviews which were written in the past and they don’t have a rating. So, we have to build an

  application which can predict the rating by seeing the review.

- ## Conceptual Background of the Domain Problem

  Data is gather from different different e-commerce web site’s. Data is scrap by using selenium. Selenium is one of best testing tool that i’ve used for to scrap data from the e-commerce website’s html page. Data have the three columns i.e Rating Heading, Rating and Review. So i have a scrap a data from such as amazon and flipkart. I have scrap review and rating approx 200 rows both positive and negative review and also i have handle to scrap close to equal number of ratings like 1 ,2,3,4,5 star from each products. Product like laptops, monitots, headphones, smart wathches, mobiles, routers and home theaters.

- Motivation for the Problem Undertaken

  Motivation of this project is to determine the rating form out of 5 star on the basis of review written by user. This also help’s to determine the product quality and type of review that is towards to positive or negative. On the basis of rating we can conclude the quality of product if product has much number of 5 star rating’s means product was awesome if average rating is 3 or 4 star means product has some positive and some negative wich has to improve or rectifies those issues.

Analytical Problem Framing

- Data Sources and their formats

  In this project i've scrap almost 1 lack 14 thousand rows. So i have took a sample data upto 35 thousand rows and worked on it. This sample data can be inference to eniter data. While scrappind the review some of rows got null values or got null values in rating column. I have drop those columns which has null or having string like "-". Firstly i have created different different csv files for each product with respect to web sites. Created on data frame in which i have merged all the data sets and created one sigle data.

- Data Preprocessing Done

  In this project each data is in text formate machine can understand only numbers. So for this i have used tool kit of NLP (Natual Language Processing) that is NLTK. In the part of data cleaning i have removed stopwords, punctuation, emogis, numbers extra spaces, words length have less than 2, and removed email addresses etc. Because this type of data is not use full for the prediction rating this type of words are increasing the length of the text. After cleaning the data i have stem each words to give the base words and remove plural's and tenses. For stemming the words i have used Lemmatization package which is in NLTK. After all these steps i have converted text to numbers by using TFIDF and Count Vectorizer

What were the steps followed for the cleaning of the data? What were the assumptions done and what were the next actions steps over that?

- ## Data Inputs- Logic- Output Relationships

  Review’s are in text formate and in any certain language’s. Based on words present in the review rating get predicted. Suppose in review word’s like excellent great awesome this type of words represents product was really good and it will give a raitng 4or 5 star. Same as neagtive words will give rating 1 or 2 star.

- ## Hardware and Software Requirements and Tools Used

  Tools and libraries that i have used to solve project:

  - Software: Anaconda, Jupyter Notebook, Python3, Google Colab.
  - Libraries: Numpy, Pandas, Matplotlib, Seaborn, Sklearn.

Model/s Development and Evaluation

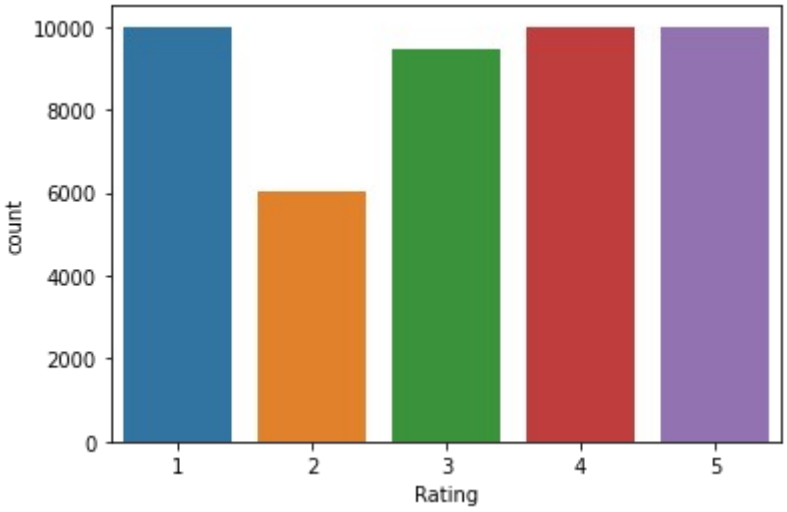
- Identification of possible problem-solving approaches (methods)

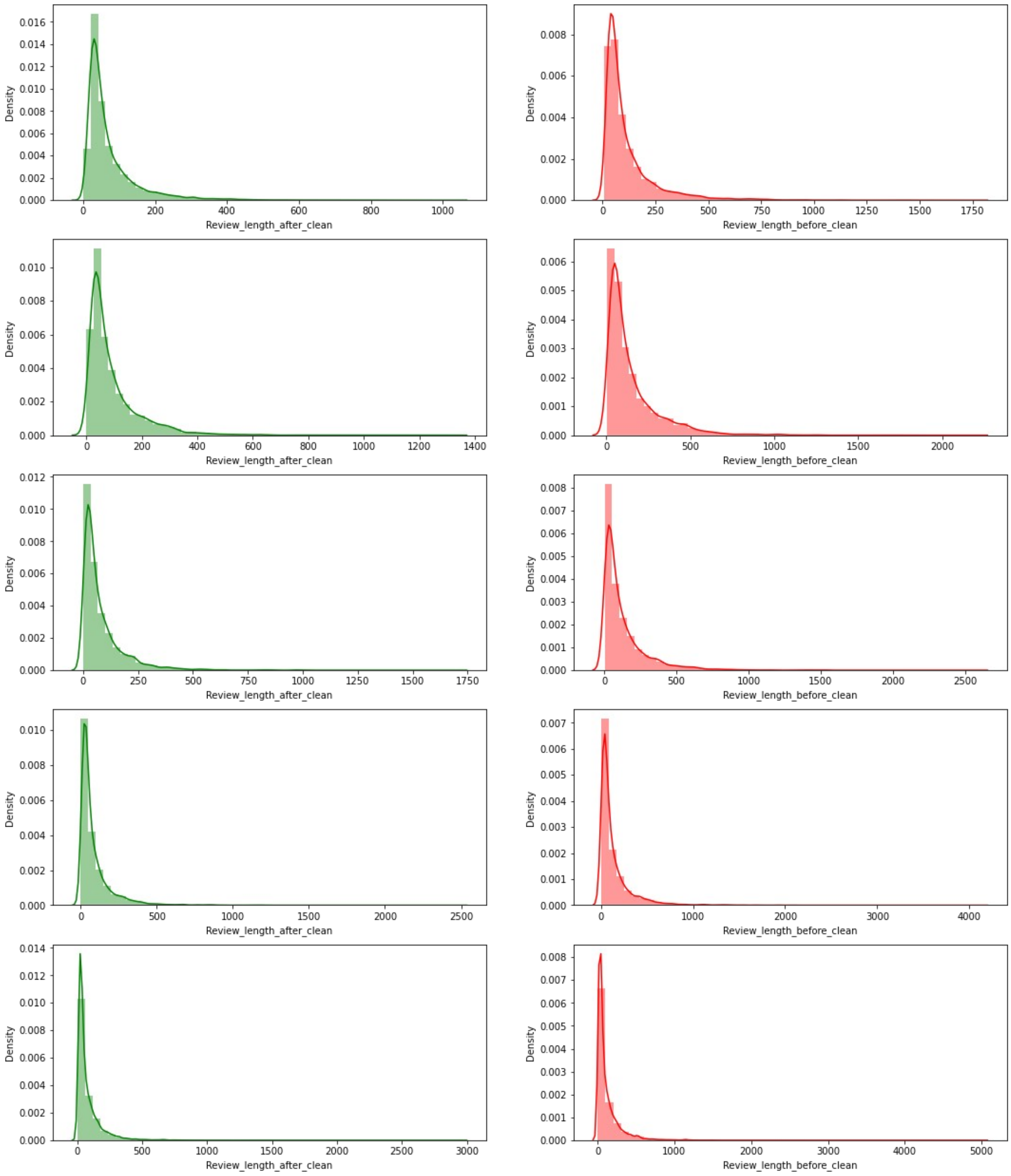
  The data set contain lable data and target data lable has cleaned by some EDA steps. Target data is in the form of classified i.e (Rating). By seeing the our target column we can conclude that this problem comes under supervised and Classification Problem. Target column having in factor . For more testing SVC, Decision Tress Classifier, KNN algorithms have used. Rather testing on one by one algorithm and choosing best alogithm and hyper tuning that best model. I have hyper tunned all the algorithm and added into pipeline so i will get best algorithm along with the best parameters.

- Testing of Identified Approaches (Algorithms)

  For testing how good model is generated. I have splitted data set into two parts (70% 30%) and each part is splited into further two part that are lable data and target data. First 70% splited data is used for training the model and another rest of 30% used for Prediction testing the model how good model is predicted in terms of percentage.

- Visualizations





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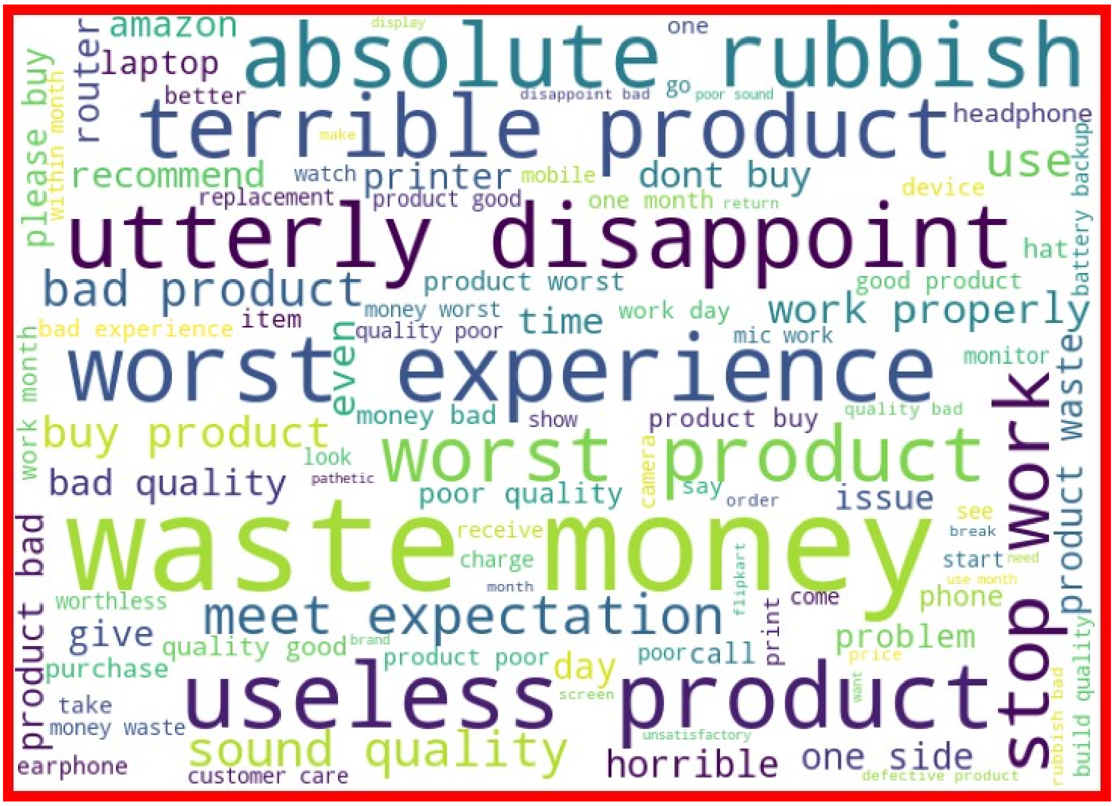

absolute rubbish
terrible product
utterly disappoint
worst experience
worst product
waste money
useless product
stop work
meet expectation
sound quality
bad product
work properly
buy product
bad quality
poor quality
dont buy
amazon
laptop
router
please buy
recommend
printer
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product worst
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money worst
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quality poor
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design
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game
router
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display
build quality
sometime
product nice
performance

CONCLUSION

- Learning Outcomes of the Study in respect of Data Science

  I have learn some inbuild funtion of python at the time of data cleaning. Object columns to Integer are done by using python map function over on lambda function. The main challenging is that to run all model once and get the best model name with best parameters also with a AUC ROC curve plot. This is done by using pipeline. This will helps me to get out from overfitting and underfitting.