Lambton College

Sentiment Analyser with response system on Tim Hortons Google reviews

Abstract:

A **Sentiment analyser and response system** that lets business owners and managers analyse the customer's google reviews. The core of the project is based on **Web Scraping through Beautiful soup and Selenium and building Sentiment Analysis using Natural Language processing.** This would let business owners and managers acquire a lucid picture of the customer's sentiment about their brand and also help them figure out the root cause of the issues discussed by the customer's in the reviews. An **NLP model** is used to predict the sentiment of the review, and response system is placed based on the sentiment of the review, this will help the organisation work on the customers' most discussed issues and resolve and increase their productivity.

Architecture:

- Python wrapper function to transform the raw html format of reviews to a Pandas Data Frame.
- EDA analysis on the review dataset
- Hypothesis tests on the Rating feature.
- A deep learning model that classifies whether a review is positive or negative.

Statement of Need

Several services are available for the business to get an in-depth analysis of financial statements and a
few more advanced services to analyse customer preferences. Still, not many focuses on extracting the
sentiment of the reviews publicly available through other platforms and also help the organization
understand the customer issues, solve them, and increase their productivity.

This sentiment analyser, apart from giving descriptive stats to the business, also lets them get insights about:

1. How different and similar are the reviews of their particular business with others in a particular locality.
2. Latent Sentiment Analysis
3. Priorities the customer issues and increase customer satisfaction with their productivity.

Project Activity

- **Web Scraping**: This initial step will help us extract the relevant and genuine data from the websites using python libraries such as Beautiful soup and Selenium.

- **Pre-processing and Exploratory Data Analysis**: Once data is acquired, we will apply pre-processing techniques such as removing stop words, Tokenization, Stemming, Lemmatization, POS tagging, and Exploratory Data Analysis.
- **Model Development:** Performing Sentiment Analysis on the data by using NLP techniques and building a model to automatically response on the review
- **Intrinsic and Extrinsic Evaluations** evaluate the result of both the sentiment Analyser models. The evaluation metrics, such as **Accuracy**, **Precision** and other metrics are used to assess the model performance.
- These issues of **word cloud** and Exploratory data analysis is performed.

S.No	Life _cycle	Description of Tasks	Team Member	Start_date	End_date	Status	Comments
		1. Business Requirements and analysing the data	Ismail / Kalyan				
1	Requirements / Design	3. Designing the Architecture of the project	Nikhil / Dileep	14-Mar-23	16-Mar-23	In Progress	
		1. Scrapping the website using python libraries such as Beautiful soup and Selenium	Ismail				
		2. Validation of Extracted data	Dileep				
		3. Performing basic preprocessing steps	Nikhil				
		4. Performing Exploratory data Analysis	Ismail/Kalyan				
		5 Buidling the Sentiment Analysis using NLP Model	Ismail				
2	Development	7. Building an Model for Automation response	Kalyan	17-Mar-23	1-Apr-23	Yet to start	
3	Testing	1. Evaluation of model and testing of project	Ismail & Kalyan	2-Apr-23	5-Apr-23	Yet to start	
4	Deployment	1. Deployement of model and project	Ismail & Kalyan	6-Apr-23	8-Apr-23	Yet to start	
	In progress						
	Not started						
	Completed						
	Not completed						

Fig.1 Project Timeline

Benefits for the Businesses

1. Helps them quickly assess the issues in operation.
2. Make or change amendments as per the majority opinion of the customers.
3. Let's them analyse if a particular issue is evident across a locality or indigenous

Evaluation

Evaluation of models is done by both Intrinsic and Extrinsic Evaluation for the NLP Model. Intrinsic evaluation metrics such as Accuracy, Precision and other metrics are used, and Extrinsic, Business evaluation is done manually. Business feedback is also considered for the project's success after deployment.

Deployment

Deployment of the project is on the local computer and requesting a prospective business owner to try the application, and analysing his feedback would be a touchstone for evaluating the project.