**Sentiment Analysis of Restaurant Customer Reviews**

**Proposal**

Sentiment analysis is a powerful marketing technique that allows product managers to better understand customer attitudes and use that information in their marketing initiatives. Furthermore, it is a crucial aspect for customer loyalty as well as the performance of advertising and marketing since it may assist product managers in making more rapid changes to their product. In short, sentiment analysis concerns categorizing user attitudes regarding a target product from textual content into "positive," "negative," and "neutral" categories.  In this project, we will build a model that predicts the sentiments of customer reviews regarding our restaurant. The dataset consists of 10970 instances with a large quantity of features since it is in textual form with its corresponding label. You can find the dataset at the following link: https://raw.githubusercontent.com/hadyelsahar/large-arabic-sentiment-analysis-resouces/master/datasets/RES.csv.

1. **Proposed Framework**

Diagram

Description automatically generated

Figure 1:The proposed framework

In general, our system consists of three stages, as presented in previous Figure .

1. **Preprocessing**

Preprocessing is an important stage; it is used for preparing the data set for model construction. .**First** , normalization is applied to make characters more consistent. **Second**, tokenization splits the textual data into a sequence of tokens and removes spaces so that each word is separated by only one white space.to transform it into a suitable form for processing. **Third,** filteringis used to remove all non-alphabetic characters, especially signs frequently used on Twitter, such as (#) for hashtags and (@) for usernames. Moreover, stop word filtering and numbers and letters written in other languages must be removed. **Forth ,** ituses a stemming step to mitigate language complexities.

1. **Construct model**

The collected data set is divided into a training set and a testing set. Machine learning algorithms use training data sets to construct a model used to classify new tweets while the testing set is used to evaluate the constructed model.

1. **Analysis and visualization**

To better grasp and utilize the data, it must be analyzed and visualized in a simplified manner, to help managers draw conclusions and make the correct decisions for their products.

1. **Tools**

In this project, we will use several well-known libraries in python such as:

Pandas, NumPy, Sklearn, Matploitlib, Keras and NLTK.

1. **MVP**

Build several models and evaluate them in terms of accuracy, precision, and recall.