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Your personal Data Scientist

Software Requirement Specification

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CSE 339

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**1. Introduction**

* 1. *Purpose*

To extremely stream-line the process of Data Analysis in the field of Data science. Helps every data-enthusiast to pre-process the data, visualize, gain insights of the data and also train a machine learning model (depending on the type of data provided) just while communicating with “----” in high-level language (English). This tool is highly influential to prove that Data Science is highly powerful, simultaneously demonstrating how easy it is to use Data to produce significant and critical results for any domain in a global perspective. This tool will prove that analysis of any given data can be done ***without*** a single line of code.

* 1. *Description*

A REST-API service integrated with a user-friendly and compelling UI where the user can upload the data, communicate with the assistant in a high-level language (English), use different graphs to visualize the data points, gain insights about the data in-hand, and train a basic model. And, all of that is done only through typing the text in the tool and not a single line of code, where real-time processing is done in the backend. These are the basic four steps in a conventional data science field, all streamlined to achieve the best productivity along with ease of analyzing the data.

* 1. *Scope*
* Maintain a global perspective
* Make data science compelling
* Useful for amateur data scientists
* Easy access to tools in data science
* Text-based preprocessing, visualization and model building
* Streamline the process of data analysis to the greatest extent
* A viable solution which serves as a foundation for solving global problems**­­­**
* Targeting multiple levels of user types, newbies, beginners, amateurs, professionals in Data science field.
  1. *Overview*

1. The user is asked to upload a dataset.
2. The user is then prompted to choose between Pre-processing, Visualization or Model building.
3. Choosing pre-process, the user can communicate in the form of text with “----” data assistant which is basically a REST API service.
4. Pre-processing enables user to write text to remove null values, nan values, drop columns in a dataframe, data type conversion, and also encode the string or categorical features to make processing easy for machine learning models. He can do some basic math calculations like finding the minimum, maximum, mean, standard deviation, variance, skewness and kurtosis of any give column.
5. Choosing visualization, the user is directly taken to the visualizations segment where the he can communicate with the assistant to utilize features of different graph and features in Seaborn and Matplotlib library. Simple text is converted to visualizations of the data.
6. The user can also upload an image and select the text in the image and then make a query based on the data.
7. Gaining insights about the data is an integral part of data analytics, this part is included in the visualization segment of “----“. The user is given the inference from the graph.
8. Handling of graphs might be straight forward, if it is about handling direct data columns. But the user can also ask for the correlation between two different columns along with the variance of the third.
9. Choosing model building, the user is given recommendation on the type of machine learning model to be applied on the dataset.
10. Once the user selects between Regression, Classification, Clustering, Natural Language processing, the user is then given the recommendation on the sub-type or the algorithm to be used on the dataset to get the best accuracy or efficiency.
11. Once the training is done, metrics related to the training are displayed. The user is given an option to download the trained model to save loads of time. He can then use the saved model later to get predictions of related data.
    1. *Definitions, Acronyms and Abbreviations*
12. Data Science – A multi-disciplinary field which uses algorithms and math to extract insights from data.
13. Data Analytics – The process of inspecting, cleansing, transforming of data and modeling.
14. Regression – A supervised machine learning for prediction continuous values
15. Classification – A supervised machine learning model for classifying multi-label or multi-class data.
16. Clustering – An unsupervised machine learning model for grouping similar data points together
17. NLP – Natural Language Processing – Subfield of AI to understand the interactions between human and machines
    1. *Technologies and libraries to be used*

* Python
* OpenCV
* TensorFlow
* Flask
* Flask Restful
* NLTK
* Sklearn
* SciPy
* Seaborn
* Matplotlib
* Keras
* Feature Extraction tool
* React js
* Node js
* Firebase
* API calls (Requests and Fetch)
* Custom library for text highlight.