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| **Project Title** | Sentiment Analysis using machine learning and NLP | | |
| **Track** | Artificial Intelligence & Machine learning | | |
| **Supervisor** | Dr. Esraa Afify | **Mentor Name** | Dr. Esraa Afify |
| **Team Name** | Matrix | | |
| **Team Members** | Elsayed Mohamed | Abdelrahman Amer | Nourhan Fareed |
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| **Problem Summary** | - This project focuses on sentiment analysis, specifically building a text  classification model for emotion prediction based on textual data.  - The dataset used in this project consists of text samples labeled with 6 emotions  into 3 classes: negative, neutral, and positive.  - The project includes data preprocessing, balancing the classes, building a pipeline with TF-IDF vectorization and Naive Bayes classifier, hyperparameter tuning using  randomized search, training the model, evaluating its performance, visualizing  the results, saving the pipeline for future use.  - The project also includes the development of a graphical user interface (GUI) using Streamlit. | | |
| **Methodology** | - Text data and known labels reading the dataset and visualizing it using pandas, matplotlib, and seaborn libraries, and solve imbalance between classes is visualized using a countplot.  - Data preprocessing remove noise removal: stop words and make tokenization: word tokenize and word normalization: porterStemmer, wordNetLemmatizer.  - Build Pipeline the pipeline includes the TfidfVectorizer for feature extraction and the Naive Bayes classifier for training and use Randomized Search to find the best  hyperparameters for the pipeline.  - Training machine learning model Fit naive Bayes model on the training data  using the pipeline with the best hyperparameters.  - Evaluation the performance of the model achieved an accuracy of 92%.  - Visualization with heatmap of the confusion matrix is plotted to visualize  the performance of the model.  - Save the pipeline using joblib library.  - Build GUI using the Streamlit library. | | |
| **Achievements and Skills Gained** | - We were among the top 5 projects in the faculty!   1. Teamwork 2. Leadership 3. Time management 4. Machine learning 5. NLP | | |

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| **Main Results** | - Achieving an accuracy of 93%  Positive! |
| **Discussion and Conclusion** | This project contributes to the field of natural language processing by providing insights into sentiment analysis and emotion prediction. The demonstrated techniques and methodologies can be applied in various domains, such as social media sentiment analysis, customer feedback analysis, and market research. |
| **References** | https://www.researchgate.net/publication/339494742\_Measuring\_Public\_Opinion\_with\_Social\_Media\_Use\_in\_Local\_Government\_of\_Asian\_Cities |
| **Future Work and Suggestions** | We will integrate deep learning using RNN LTSM model to improve acuuracy and integrate this project with chatbot mobile app! |
| **Group Photo** |  |