MIT-WPU
॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

Dr. Vishwanath Karad
MIT WORLD PEACE UNIVERSITY | PUNE
TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

Team name: **TARS**

Team Members:-

Swar Shah (1032220933)

Jayesh Mahajan (1032220100)

Bhoumik Shah (1032220072)

Topics for the project

1. Sentiment analysis using statistical models
2. Predictive Analysis Using Mathematical Models
3. Classification Using Neural Networks

1. Sentiment analysis using statistical models

Objectives

- Understanding opinions: Identifying the sentiment expressed in text.
- Identifying trends: Tracking how sentiment changes over time.
- Making predictions: While not always accurate, sentiment can sometimes be used to predict future trends, such as in market research or social media monitoring.
- Market research: Gauging public opinion about products, services, or issues. Customer feedback: Analyzing customer reviews or social media posts to understand product or service perception.

1. Sentiment analysis using statistical models

Needs

- Sentiment analysis leverages statistical models to extract subjective information from text. By quantifying sentiment, businesses can gauge customer opinions, track brand perception, predict market shifts, and optimize strategies. It aids in transforming unstructured textual data into actionable insights.

1. Sentiment analysis using statistical models

Methodology

- Data Acquisition and Preprocessing: Collect and prepare textual data, including cleaning, tokenization, and normalization.
- Model Transfer Learning: Fine-tune a pre-trained BERT model on a labeled sentiment dataset to adapt it to the specific task.
- Sentiment Prediction: Utilize the fine-tuned model to generate sentiment scores or probabilities for given text inputs.
- Sentiment Analysis and Visualization: Conduct in-depth sentiment analysis, including trend identification and visualization to derive actionable insights.

1. Sentiment analysis using statistical models

Benefits

- Extracts sentiment and opinions from textual data.
- Provides quantitative insights for informed decision-making.
- Enhances customer satisfaction through sentiment-driven strategies.

1. Sentiment analysis using statistical models

Feasibility

- Technical Challenges: Understanding of statistical models and mathematical concepts behind them Use of transformers and encoding techniques with respect to their weights of attributes Ensuirng smooth flow of pre processed data and the library to perform analysis Establishing a significant co relation between sentiment and attributes
- Research challenges: Understanding research papers and their needs to provide a significant corelation and citing the sources to provide meaningful conclusion

2. Predictive Analysis Using Mathematical Models

Objectives

- Forecasting: Predicting future values based on historical data.
- Optimization: Finding the best possible solution to a problem with given constraints.
- Classification: Categorizing data into predefined groups.

2. Predictive Analysis Using Mathematical Models

Needs

- Predictive analysis employs mathematical models to uncover patterns in data and forecast future trends. By analyzing historical data, businesses can identify correlations, make informed decisions, and optimize operations.

2. Predictive Analysis Using Mathematical Models

Methodology

- Data Collection and Preparation: Gather relevant data, clean it, and transform it into a suitable format for modeling.
- Model Selection: Choose appropriate statistical or machine learning models based on the problem type and data characteristics.
- Model Training: Build and train the model using historical data to learn underlying patterns.
- Model Evaluation: Assess the model's performance using appropriate metrics and validation techniques.
- Prediction and Optimization: Apply the trained model to make predictions or find optimal solutions.

2. Predictive Analysis Using Mathematical Models

Benefits

- Improved decision-making: Provides insights for strategic planning and resource allocation.
- Risk mitigation: Identifies potential risks and opportunities.
- Process optimization: Improves efficiency and productivity.

2. Predictive Analysis Using Mathematical Models

Feasibility

- Technical Challenges: 1)Data quality and availability. 2)Model complexity and computational resources. 3)Interpretation of model results.
- Research Challenges: 1)Selecting appropriate models and algorithms. 2)Addressing overfitting and underfitting issues. 3)Evaluating model performance and reliability.

3. Classification Using Neural Networks

Objective

- Categorize data into predefined classes or groups.
- Identify complex patterns within data for accurate classification.
- Make predictions about the class membership of new, unseen data.

3. Classification Using Neural Networks

Needs

- Large volumes of labeled data for effective training.
- Substantial computational resources for model development and training.
- Domain expertise to guide model architecture and interpretation.

3. Classification Using Neural Networks

Methodology

- Data preparation: Collect, clean, and preprocess data into a suitable format for neural network input.
- Model architecture: Design and implement a neural network architecture (e.g., CNN, RNN, DNN) aligned with the problem.
- Model training: Expose the network to labeled data to learn complex patterns and relationships.
- Model evaluation: Assess the model's performance using relevant metrics (accuracy, precision, recall, F1-score).
- Prediction: Utilize the trained model to classify new, unseen data points.

3. Classification Using Neural Networks

Benifits

- High accuracy: Capable of achieving superior classification results on complex problems.
- Automation: Automate decision-making processes once trained.
- Feature learning: Automatically extract relevant features from raw data.

3. Classification Using Neural Networks

Feasability

- Data requirements: Requires large, high-quality datasets for optimal performance.
- Computational intensity: Training complex neural networks can be resource-intensive.
- Model interpretability: Understanding the decision-making process can be challenging

Any Question ???

Thank You