

TSP- AI ML Fundamentals (Capstone Project)

HEART DISEASE PREDICTION

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OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **Algorithm & Deployment**
- **GitHub Link**
- **Project Demo(photos / videos)**
- **Conclusion**
- **Future Scope**
- **References**

Problem Statement

- The World Health organization reports that the majority of cardiovascular disease(CVD) death result from heart attacks.
- To address this, I aim to develop a predictive model to identify patients at risk of CVD using logistic regression.
- The goal is to determine the ratio of patients with a high likelihood of being affected by CVD and predict the overall risk of developing the condition.

Proposed Solution

- The goal is to create a prediction model using logistic regression to identify patients at risk for cardiovascular disease, focusing on factors like age, gender, blood pressure and cholesterol levels.
- This model aims to determine the ratio of patients likely to develop CVD and allow for early intervention by healthcare professionals to prevent CVD-related deaths.
- The World Health Organization highlights CVD as a major cause of mortality, particularly from HEART ATTACKS.

Algorithm & Deployment

- STEP 1: **DATA PREPARATION:**

Create dataset with features, target variable for heart disease. Handle missing values, encode categorical variables.

- STEP 2: **FEATURE SCALING:**

Standardize numerical features of logistic regression with uniform scale

- STEP 3: **DATASET SPLITTING:**

Split dataset into features(X) and target variable(Y). Divide into training/ testing sets for evaluation.

- STEP 4: **MODEL TRAINING:**

Instantiate, train logistic regression model on training data to predict heart disease likelihood.

- STEP 5: **MODEL EVALUATION:**

The trained model's performance on testing data is evaluated using metrics like accuracy, precision, recall, F1-score and ROC-AUC curve.

- STEP 6: **INTERPRETATION:**

Interpret coefficients in logistic regression to understand features' impact on heart disease risk prediction accuracy.

- STEP 7: **PREDICTION AND RISK ASSESSMENT:**

Utilize logistic regression model to forecast heart disease risk in new patients; calculate individual risk using predicted probabilities.

- STEP 8: **RATIO CALCULATION:**

Analyze predicted probabilities to categories patients with high risk of cardiovascular disease for targeted intervention.

- STEP 9: **DEPLOYMENT AND INTEGRATION:**

Access by healthcare professionals to aid in the diagnosis and treatment of patients at risk for heart disease.

- STEP 10: **MONITORING AND MAINTANCES:**

Regularly assess model performance, update with new data, and retain to enhance accuracy and reliability in predictions.

GitHub Link

<https://github.com/au422621105029/NM-project-.git>

Project Demo(Recorded Video)

<https://drive.google.com/file/d/1U3ZJ4abaPWCEUFqGX1R0iu8kcpMRX8ct/view?usp=sharing>

Conclusion

- Heart disease is a major cause of death worldwide, with many deaths attributed to heart attacks.
- A research project used logistic regression to create a predictive model for identifying and estimating the risk of cardiovascular disease in patients.
- By analyzing various factors, such as demographics and lifestyle, the model successfully identified patients at risk for heart disease.
- Future research should focus on improving the model's accuracy and integrating it into clinical practice to reduce mortality rates.

Future Scope

- Incorporate genetic factors for personalized risk assessment.
- Explore ensemble methods for improved prediction accuracy.
- Implement real time monitoring for proactive intervention.
- Enhance interpretability for better clinical utility.

References

https://drive.google.com/file/d/1ef5OMX8a6XQdulXqC7edZDLn8iHpmCr5/view?usp=drive_link

<https://colab.research.google.com/drive/1fQytc6oGRNaWNTXonfdOj9Pps1wu585u?usp=sharing>

1. Project Github link, RamarBose , 2024
2. Project video recorded link (youtube/github), RamarBose , 2024
3. Project PPT & Report github link, RamarBose , 2024



THANK YOU