
HeartWellness

# Meet the Team

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# Summary

*Predictive heart disease management application*

01

## *Overview*

Designed to predict the likelihood of heart disease in individuals using advanced machine learning algorithms.

02

## *Features*

User login
patient history management
Directory of doctors
Easy appointment booking

03

## *Goal*

Timely and accurate health predictions
early detection and prevention
seamless healthcare services integration

# Problem Statement

*01* *Heart Disease Prevalence*

*02* *Limitations of Traditional Methods*

*03* *Challenges for Patients*

# Literature Review

01

*Predictive Analytics in Healthcare*

Advancements

Studies

02

*Doctor-Patient Connectivity*

Accessibility

Convenience

03

*Patient Data Management*

Consistency

Integration

04

*Impact of Early Detection*

Prevention

Outcomes

# Data Collection & Prepration

Source - *Data collected from Kaggle datasets and user inputs.*

### Kaggle Dataset:

Comprehensive datasets on heart disease

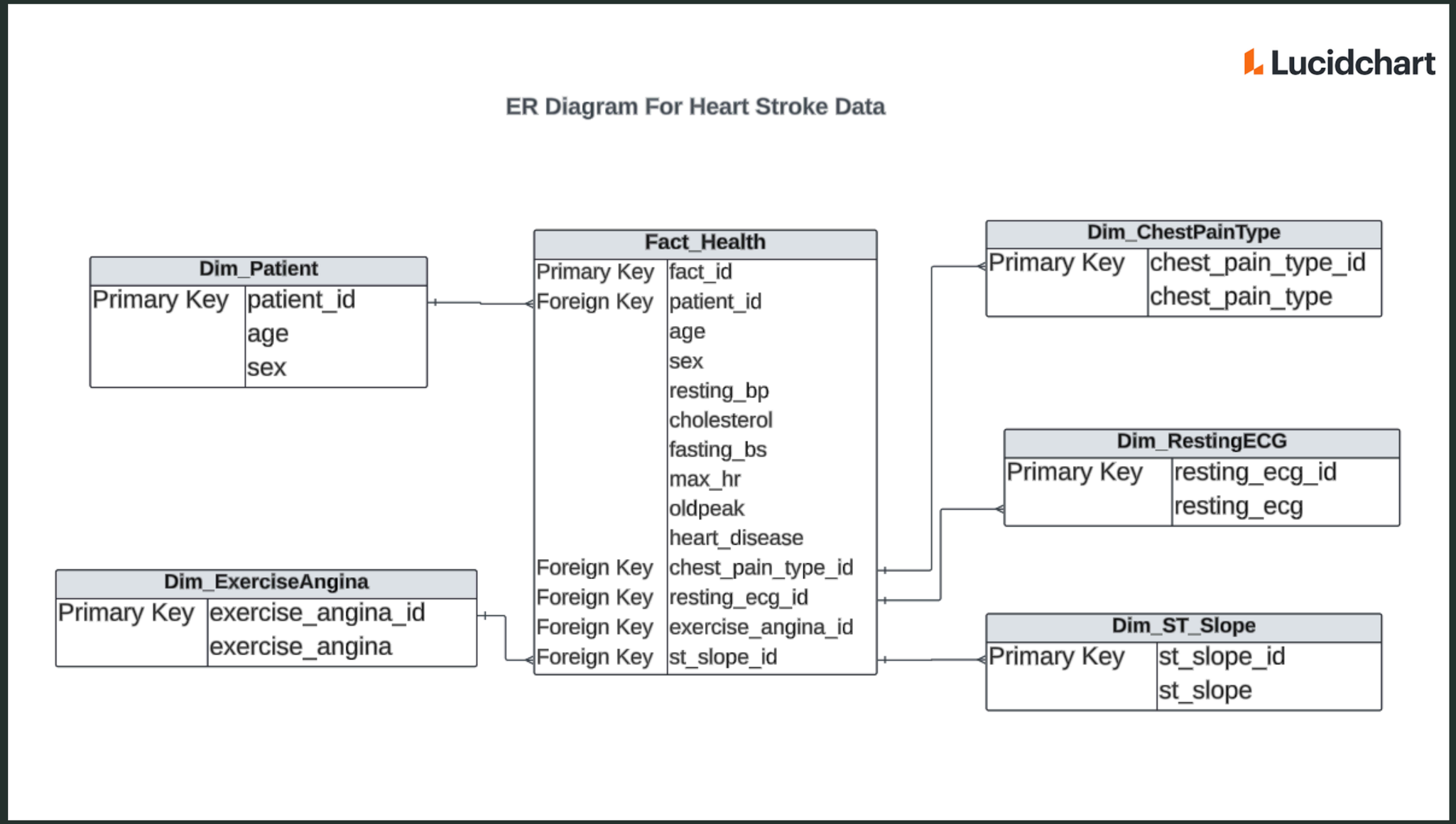
### User Inputs:

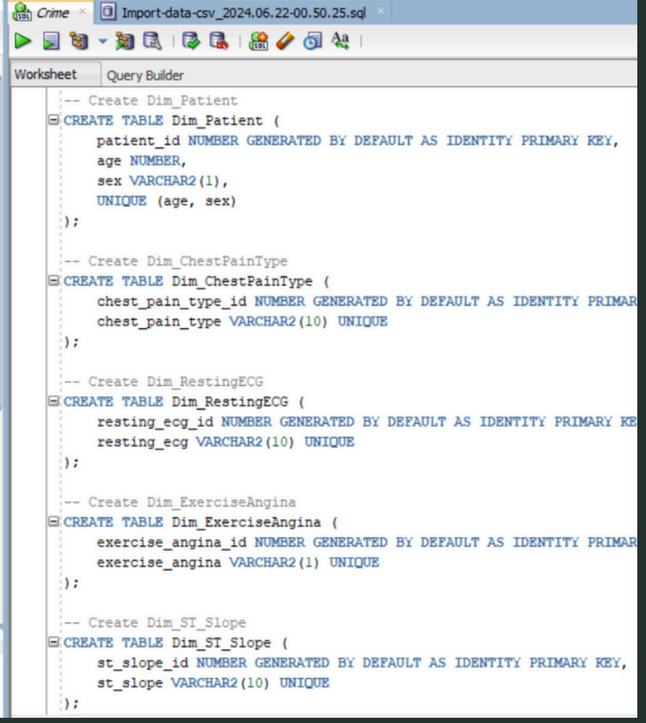
Real-time data entered by users during registration

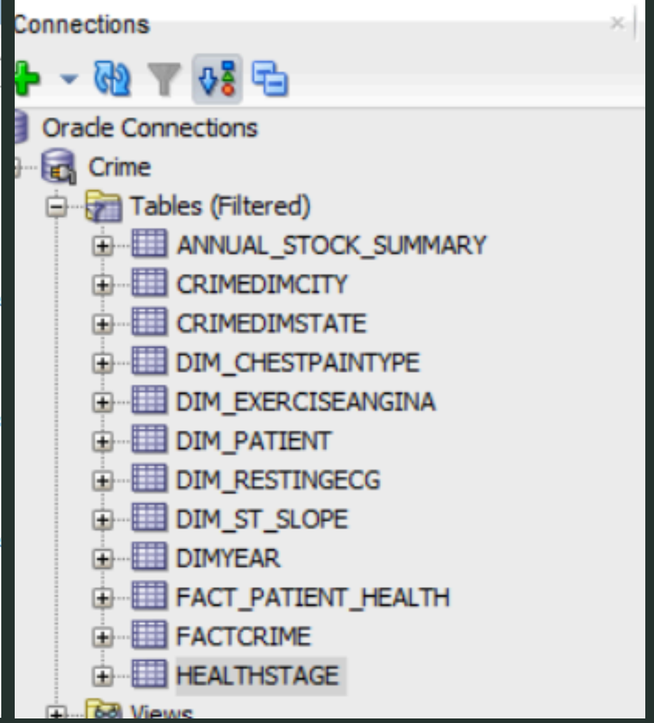
### Data Integration:

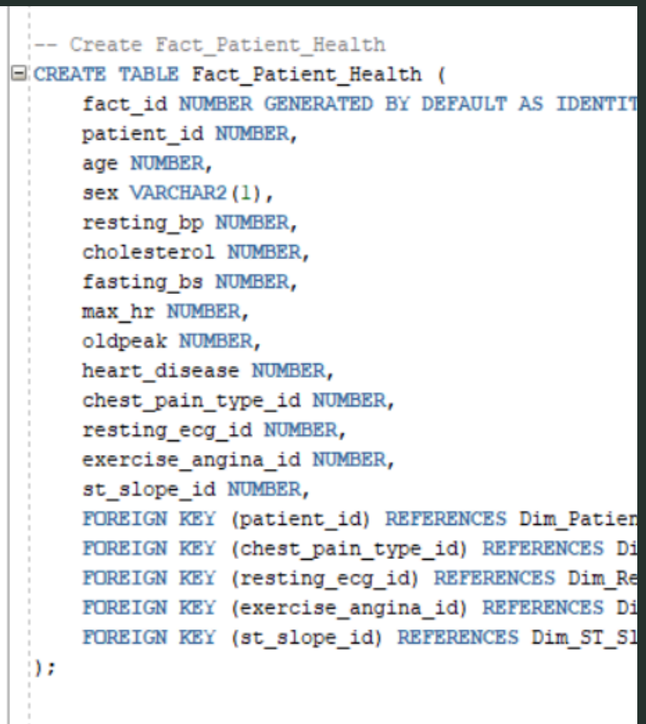
Ensuring data consistency and integrity through validation checks

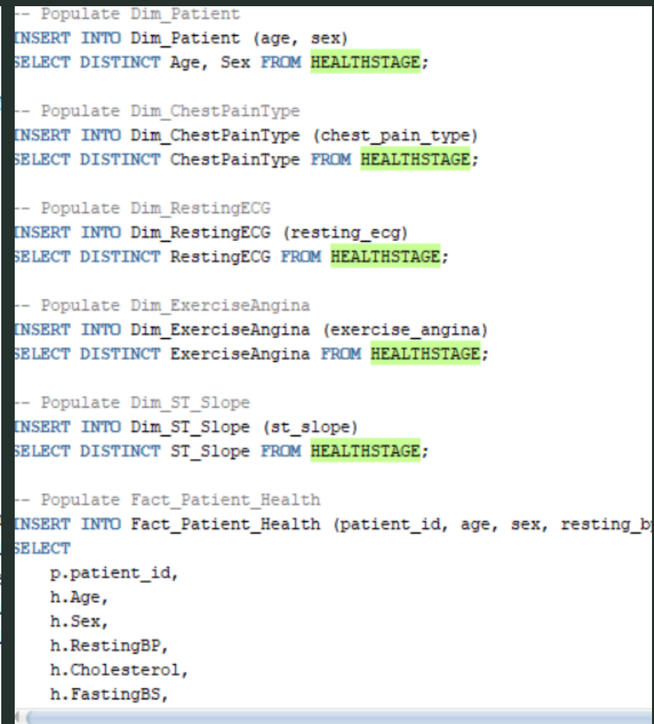
# ERD


Lucidchart
ER Diagram For Heart Stroke Data
Dim_Patient
Primary Key
patient_id
age
sex
Fact_Health
Primary Key
fact_id
Foreign Key
patient_id
age
sex
resting_bp
cholesterol
fasting_bs
max_hr
oldpeak
heart_disease
Foreign Key
chest_pain_type_id
Foreign Key
resting_ecg_id
Foreign Key
exercise_angina_id
Foreign Key
st_slope_id
Dim_ChestPainType
Primary Key
chest_pain_type_id
chest_pain_type
Dim_RestingECG
Primary Key
resting_ecg_id
resting_ecg
Dim_ExerciseAngina
Primary Key
exercise_angina_id
exercise_angina
Dim_ST_Slope
Primary Key
st_slope_id
st_slope




# ETL

- Create DIM Tables
- Database Table Listing
- Create FACT Table
- Insert data into FACT and DIM tables

# Query 1 Distribution of Heart Disease by Age

This query groups the data by age and heart disease status, then counts the number of occurrences in each group.

```
-- Distribution of Heart
SELECT
    Age,
    HeartDisease,
    COUNT(*) AS count
FROM
    HEALTHSTAGE
GROUP BY
    Age, HeartDisease
ORDER BY
    Age;
```

Script Output x | Query Result x | Q

SQL | Fetched 50 rows in 0.

| | AGE | HEARTDISEASE | COUNT |
|---|---|---|---|
| 1 | 28 | 0 | 1 |
| 2 | 29 | 0 | 3 |
| 3 | 30 | 0 | 1 |
| 4 | 31 | 0 | 1 |
| 5 | 31 | 1 | 1 |
| 6 | 32 | 0 | 3 |
| 7 | 32 | 1 | 2 |
| 8 | 33 | 0 | 1 |
| 9 | 33 | 1 | 1 |
| 10 | 34 | 0 | 5 |
| 11 | 34 | 1 | 2 |
| 12 | 35 | 0 | 7 |
| 13 | 35 | 1 | 4 |
| 14 | 36 | 0 | 4 |

# Query 2 Average Cholesterol Levels by Chest Pain Type

This query calculates the average cholesterol levels for each type of chest pain.

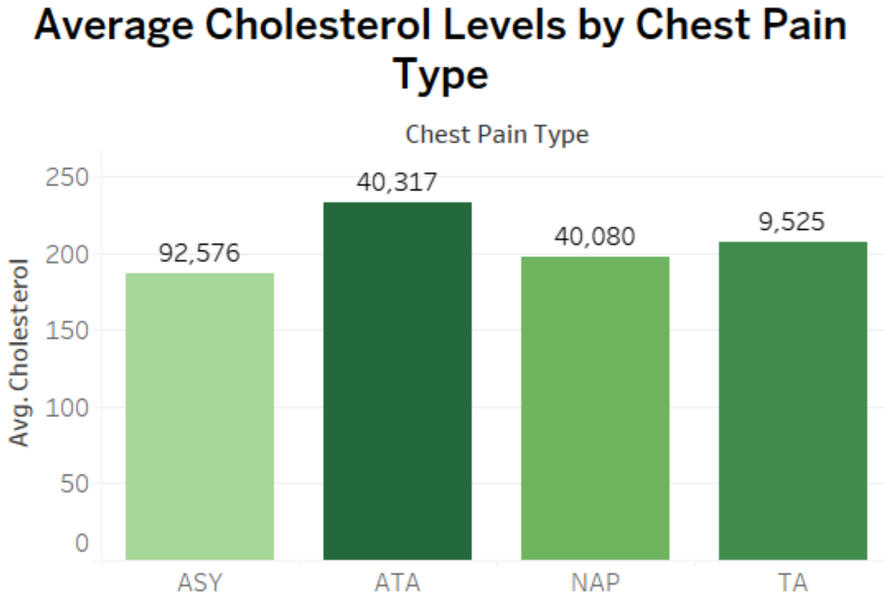
```sql
-- Average Cholesterol Levels by Chest Pain Type
SELECT
    ChestPainType,
    AVG(Cholesterol) AS avg_cholesterol
FROM
    HEALTHSTAGE
GROUP BY
    ChestPainType
ORDER BY
    ChestPainType;
```

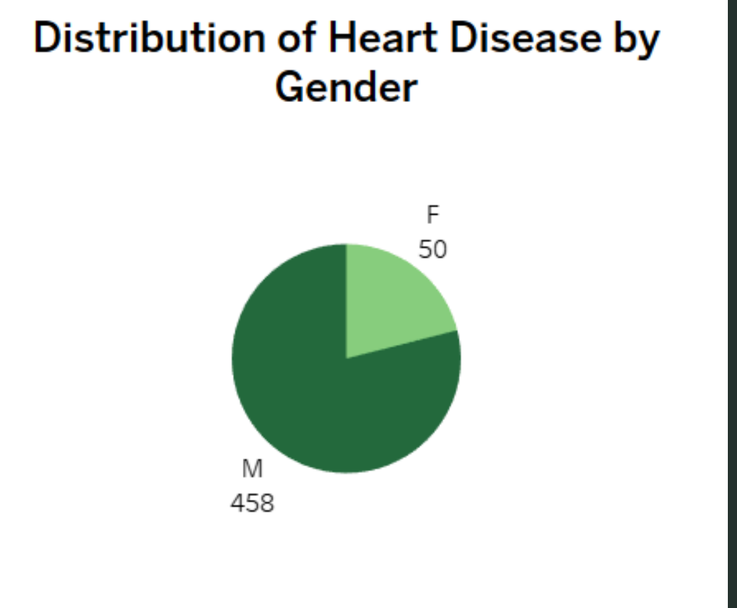
Script Output | Query Result | Query Result 1 | Query Result 2

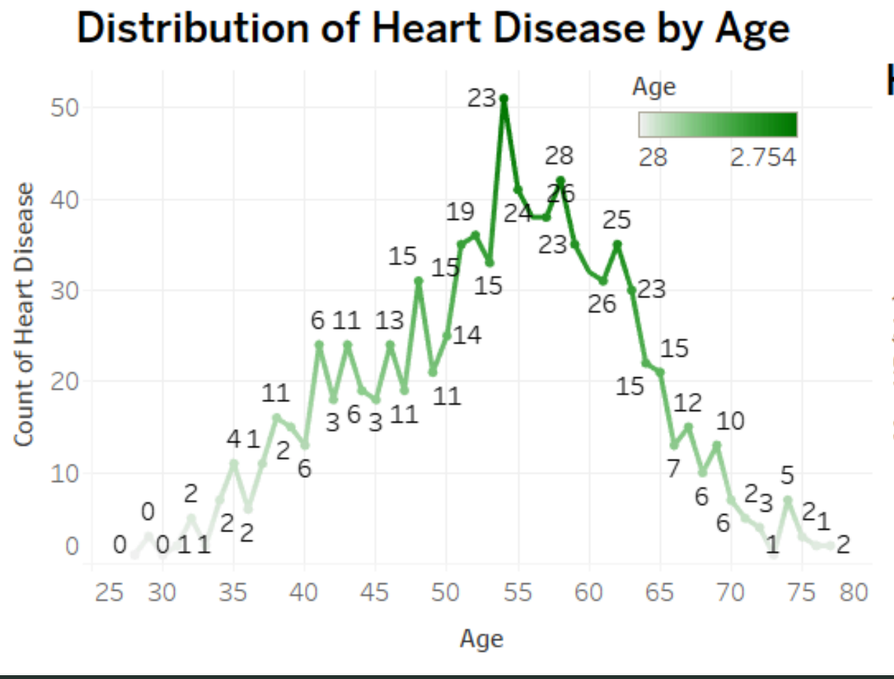
SQL | All Rows Fetched: 4 in 0.103 seconds

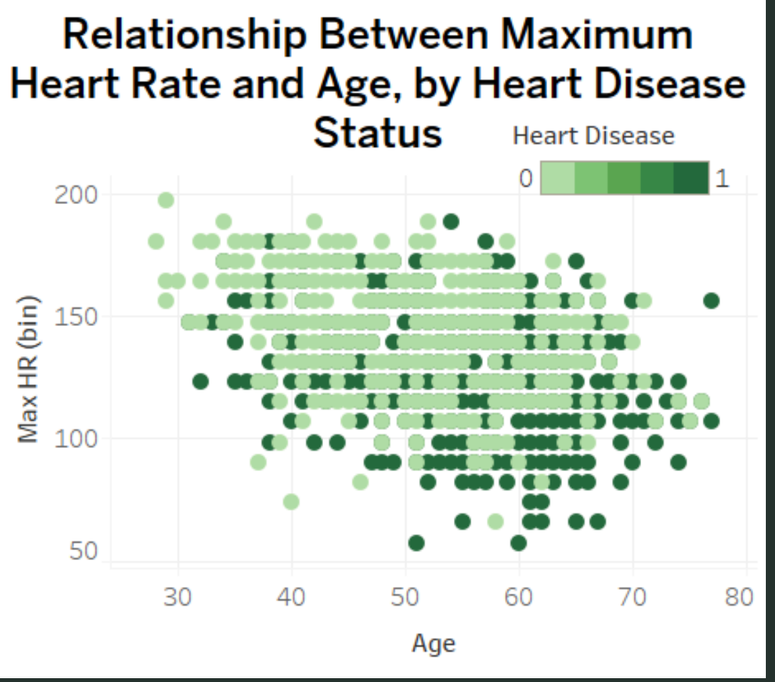
| | CHESTPAINTYPE | AVG_CHOLESTEROL |
|---|---|---|
| 1 | ASY | 186.64516129032258064516129032258064516 |
| 2 | ATA | 233.04624277456647398843930635838150289 |
| 3 | NAP | 197.43842364532019704433497536945812807 |
| 4 | TA | 207.06521739130434782608695652173913043 |

# Tableau Visualization

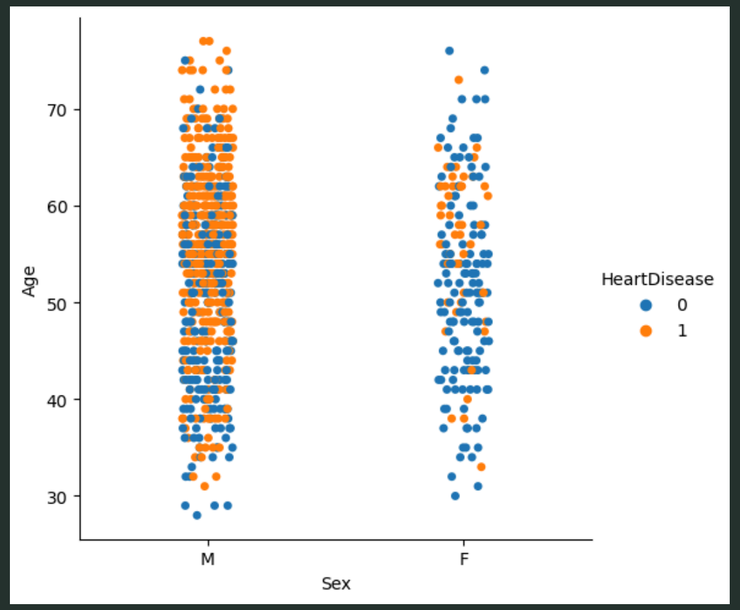


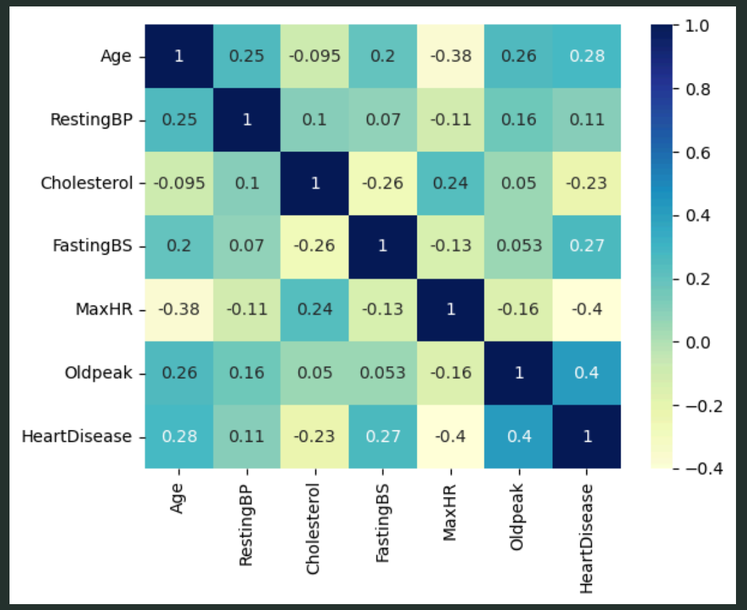



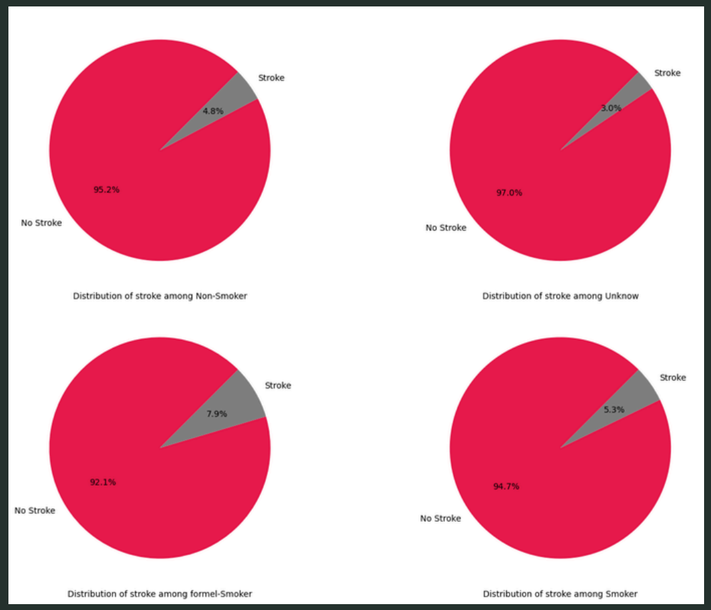
# Exploratory Data Analysis




Heart Disease related to Age

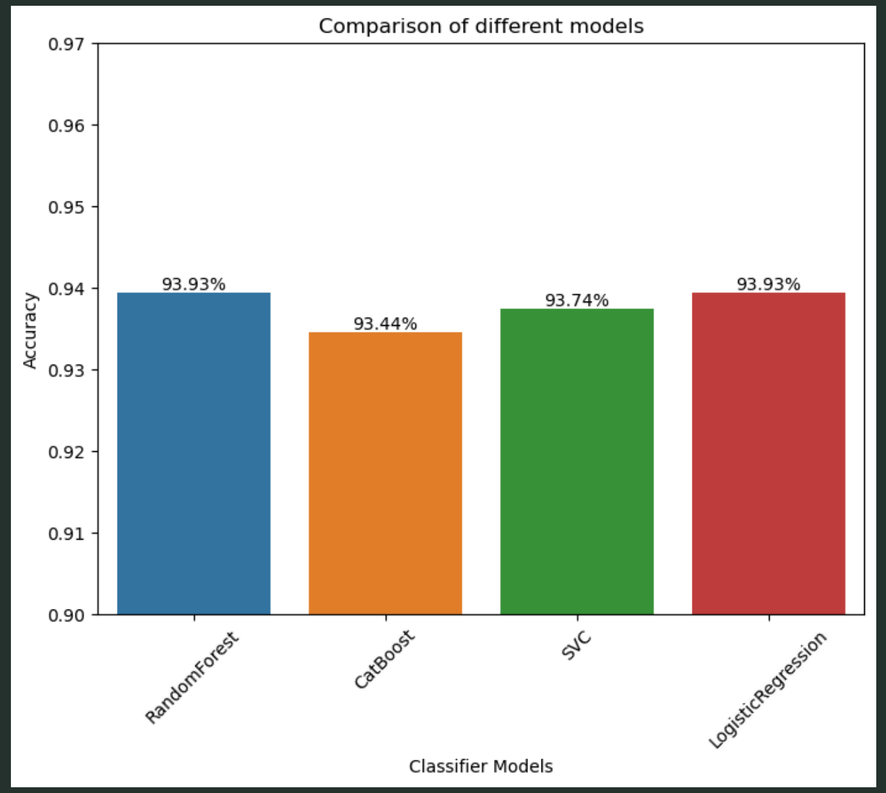



Correlation of all Features

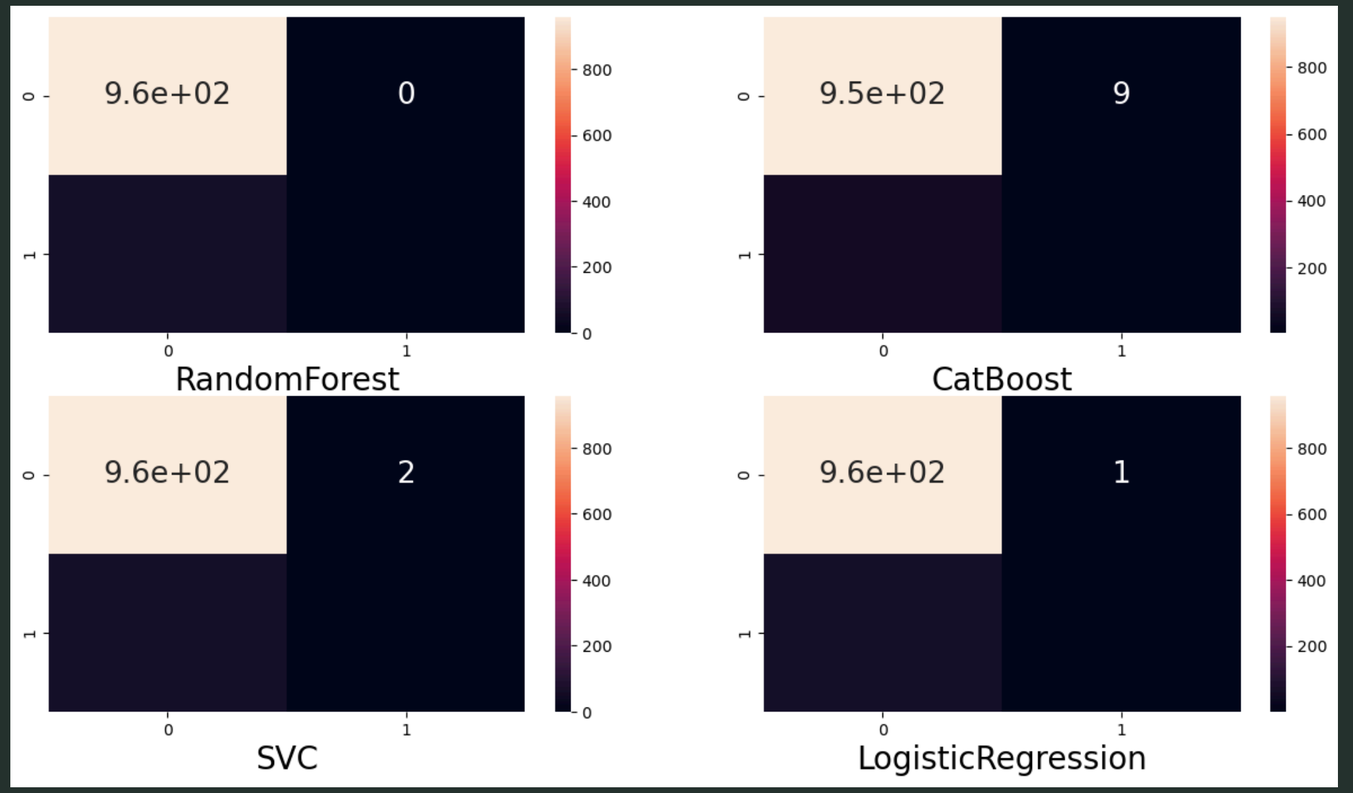



Relation of smoke and Stroke

# Result Analysis

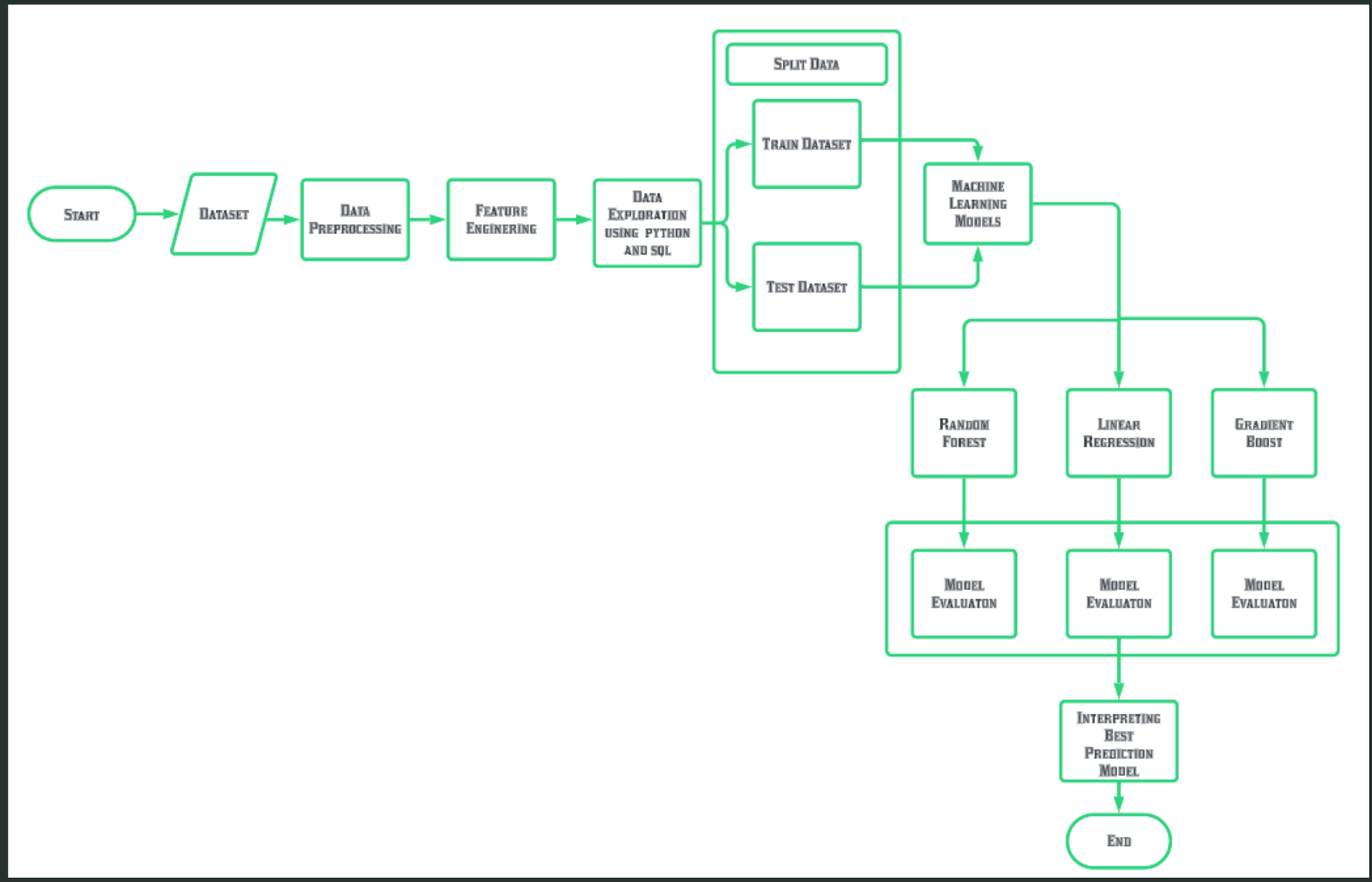



Accuracy of Models

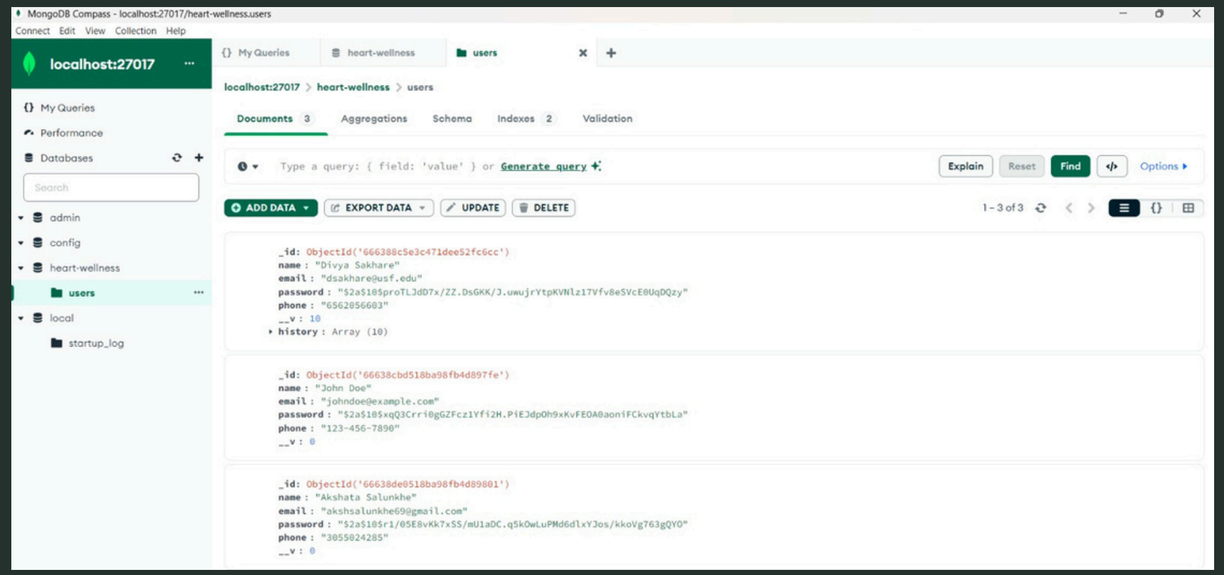



Confusion matrix of Models

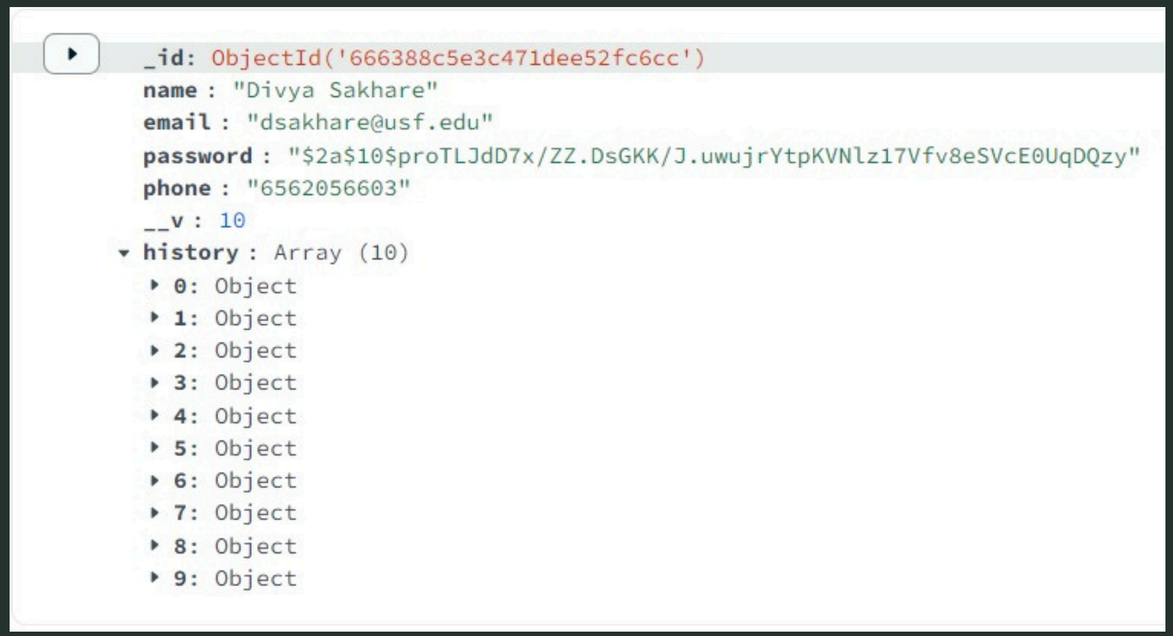
# Data Model


Start
Dataset
Data Preprocessing
Feature Enginering
Data Exploration using python and SQL
Split Data
Train Dataset
Test Dataset
Machine Learning Models
Random Forest
Linear Regression
Gradient Boost
Model Evaluaton
Model Evaluaton
Model Evaluaton
Interpreting Best Prediction Model
End

# Results

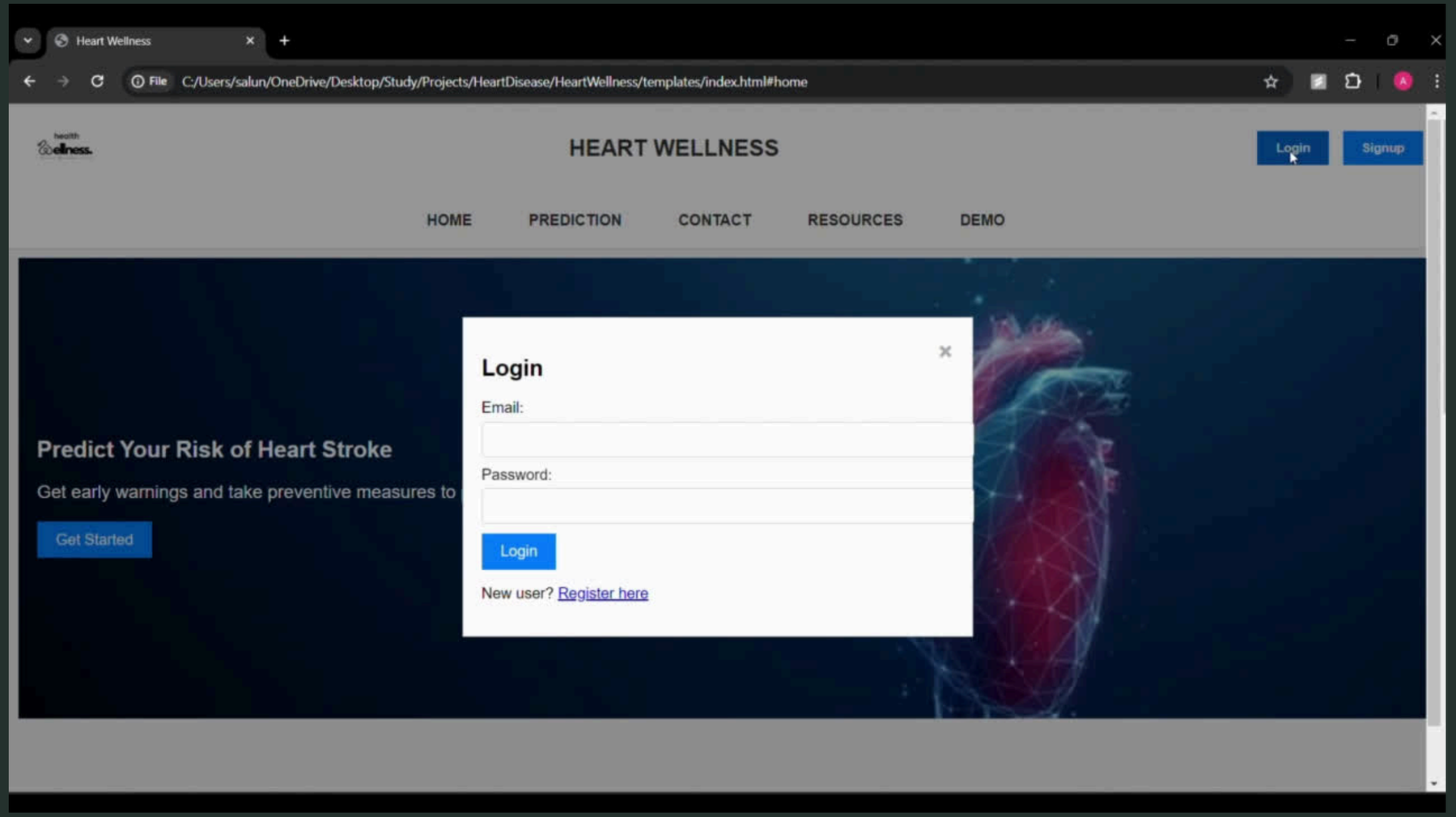



User Login data Saved in MongoDB




Patient history data Saved in MongoDB

# Demo




Github Code -https://github.com/Divyasakhare07/HeartWellness

# Future Scope

01

### *Integration with Wearable Devices*

Continuously monitor vital signs

Real-time health updates and alerts

02

### *Enhanced Machine Learning Models*

Refinement of the predictive models

More diverse datasets

03

### *Expanding Healthcare Services*

Adding features such as telemedicine consultation

Health education resources

04

### *Global Expansion*

Cater to different languages

Accessible to a broader audience

# Conclusion

## Data Management
Utilized MongoDB

## ERD Modeling
Database structure using Oracle.

## Data Visualization
Insightful visualizations with Tableau & python

## Modeling & Evaluation
Employed Python for predictive modeling and model evaluation.

## Data Analysis
Comprehensive analysis using SQL

# *Thank You*