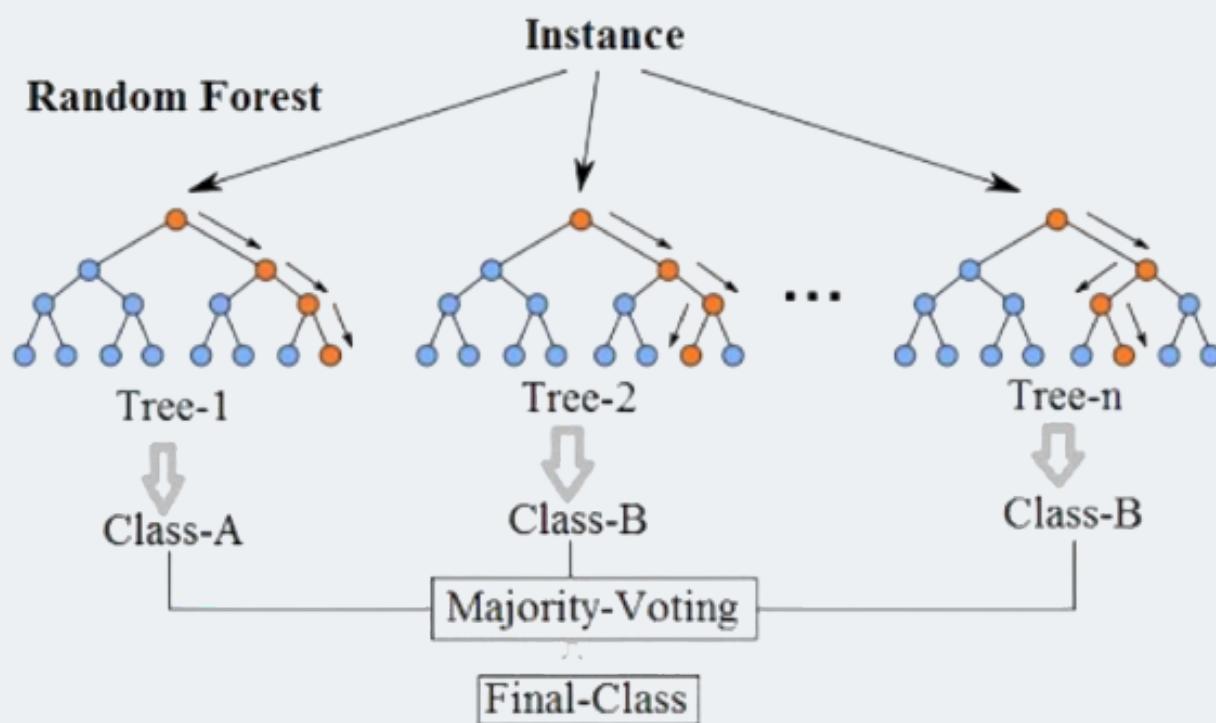
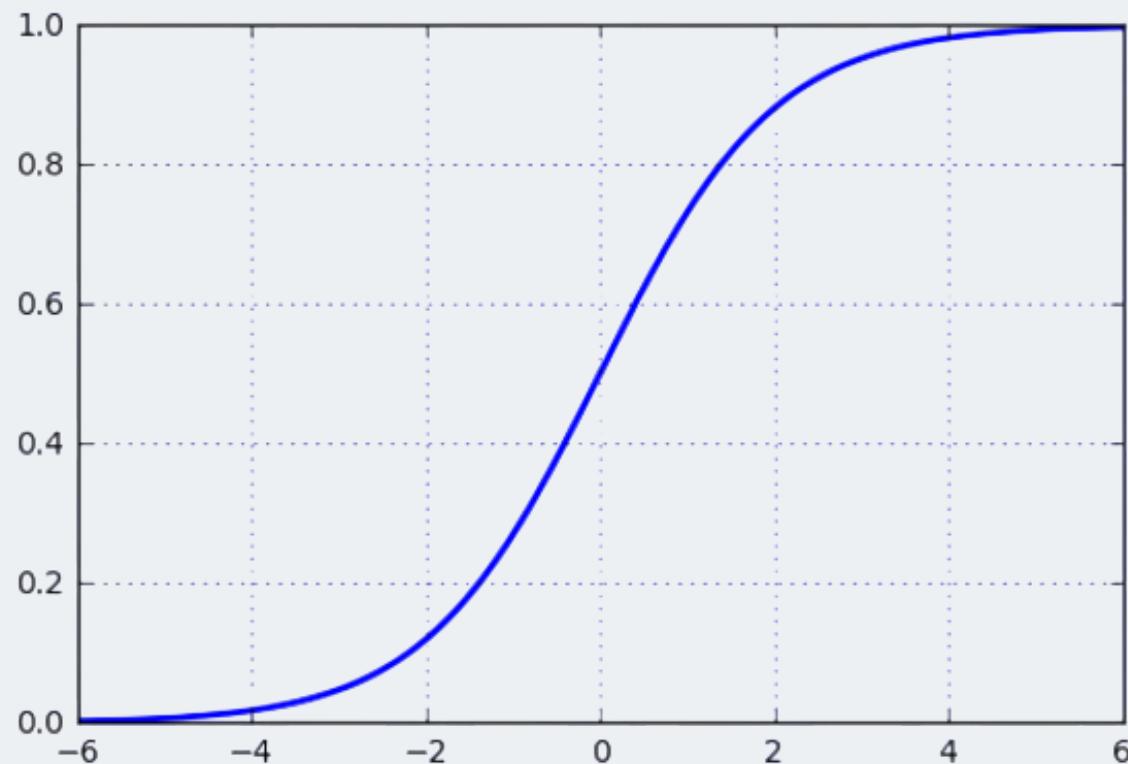


AI-Powered Heart Disease Risk Prediction



Problem Statement

01

- Heart disease is one of the leading causes of death worldwide.
- Early detection can significantly reduce risk through timely medical intervention and lifestyle changes .

 **Goal:** Predict heart disease risk using patient clinical data.



02

Dataset Overview

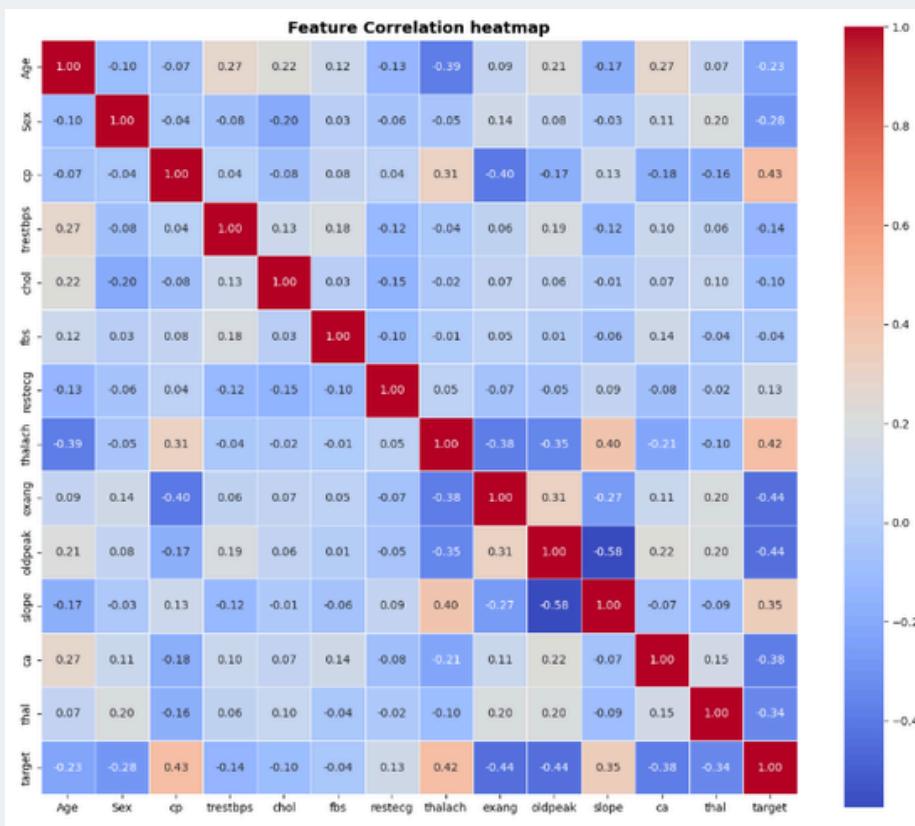
- Structured medical dataset
- Features include:
 - ◆ Age, Sex
 - ◆ Chest Pain Type
 - ◆ Blood Pressure, Cholesterol
 - ◆ ECG, FBS results
 - ◆ Exercise-induced angina
 - ◆ Major vessels, Thalassemia
- Target: Heart Disease (Yes / No)

	Age	Sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal	target
0	52	1	0	125	212	0	1	168	0	1.0	2	2	3	0
1	53	1	0	140	203	1	0	155	1	3.1	0	0	3	0
2	70	1	0	145	174	0	1	125	1	2.6	0	0	3	0
3	61	1	0	148	203	0	1	161	0	0.0	2	1	3	0
4	62	0	0	138	294	1	1	106	0	1.9	1	3	2	0

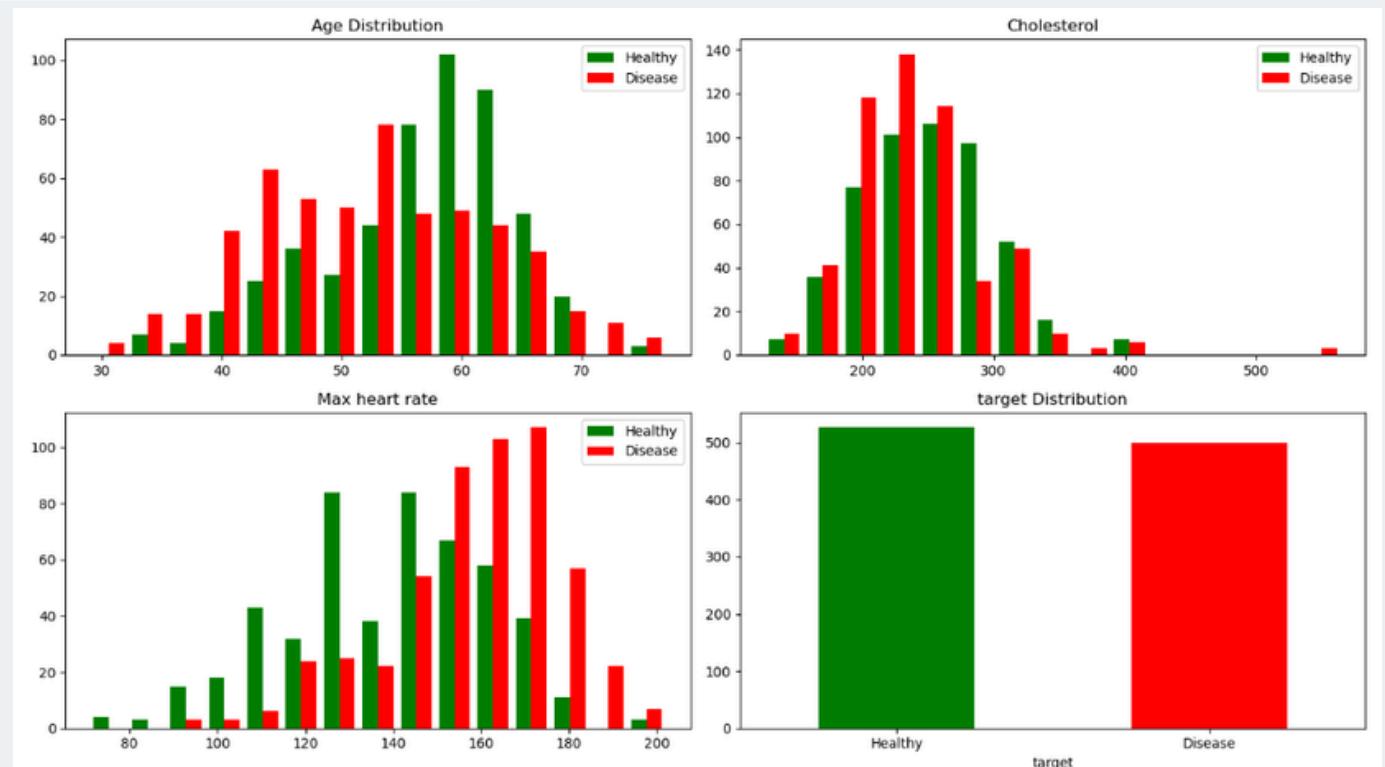
Exploratory Data Analysis (EDA)

03

- Analyzed feature patterns and target distribution
- Checked balance between heart disease classes
- Identified important health indicators

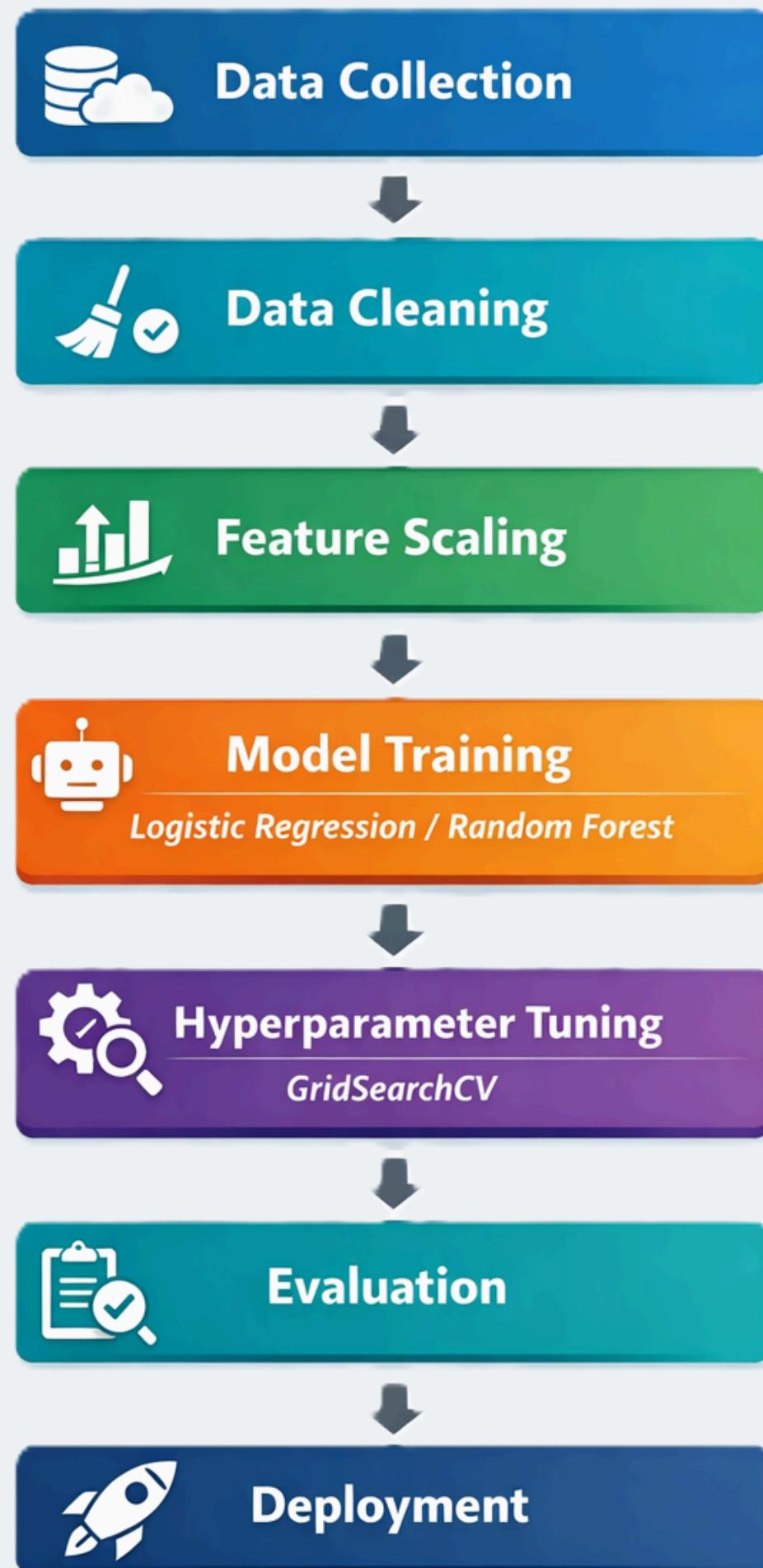


- Feature distributions differ noticeably between healthy and diseased patients.



04

ML Pipeline



Models Used

05

Logistic Regression

- Baseline model
- Interpretable
- Recall-optimized using GridSearchCV

Random Forest Classifier

- Ensemble model
- Captures non-linear patterns
- Best overall performance

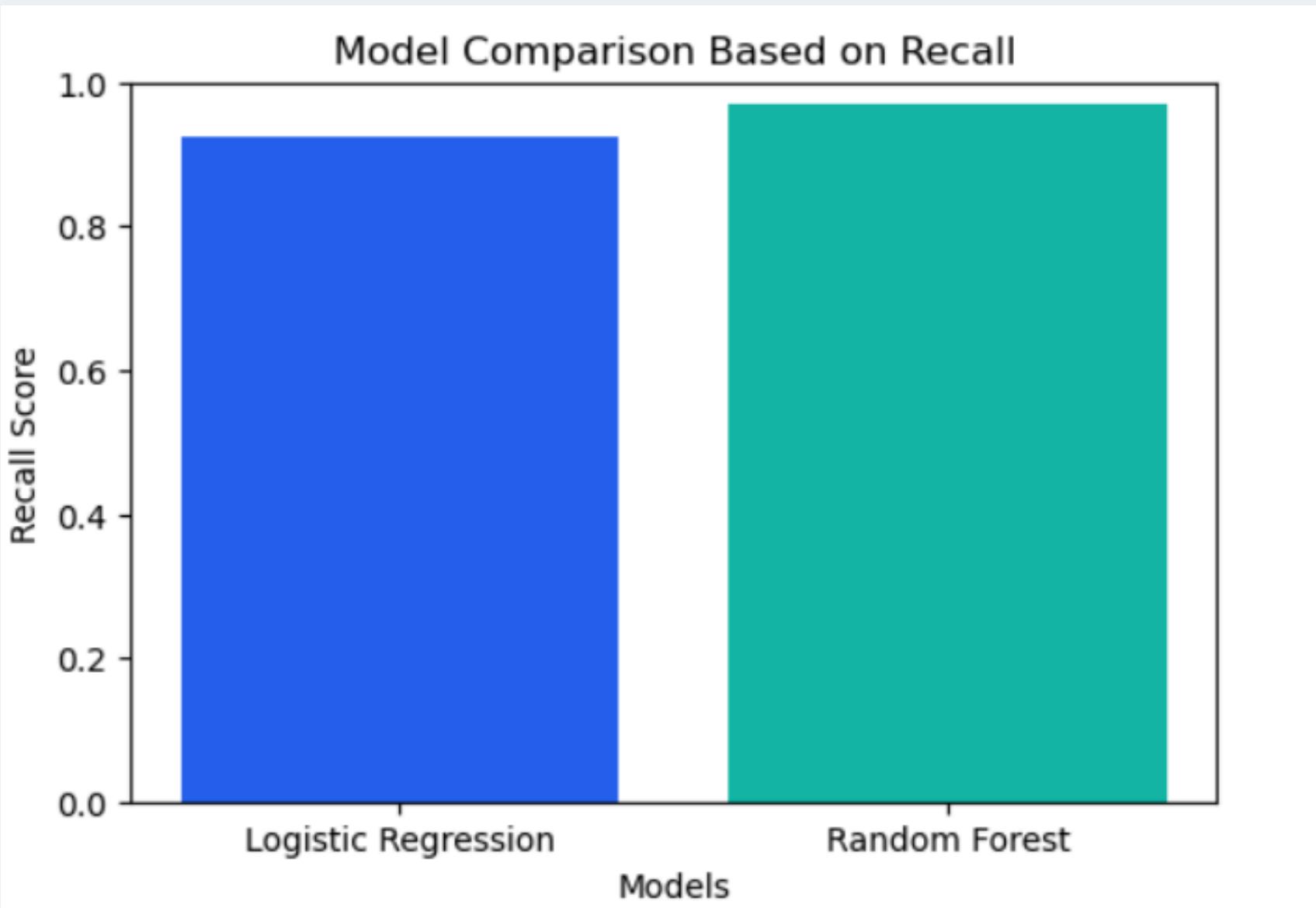
Accuracy, Recall & ROC-AUC used for Evaluation



Model Performance

Recall comparison across models highlights effectiveness in identifying high-risk patients.

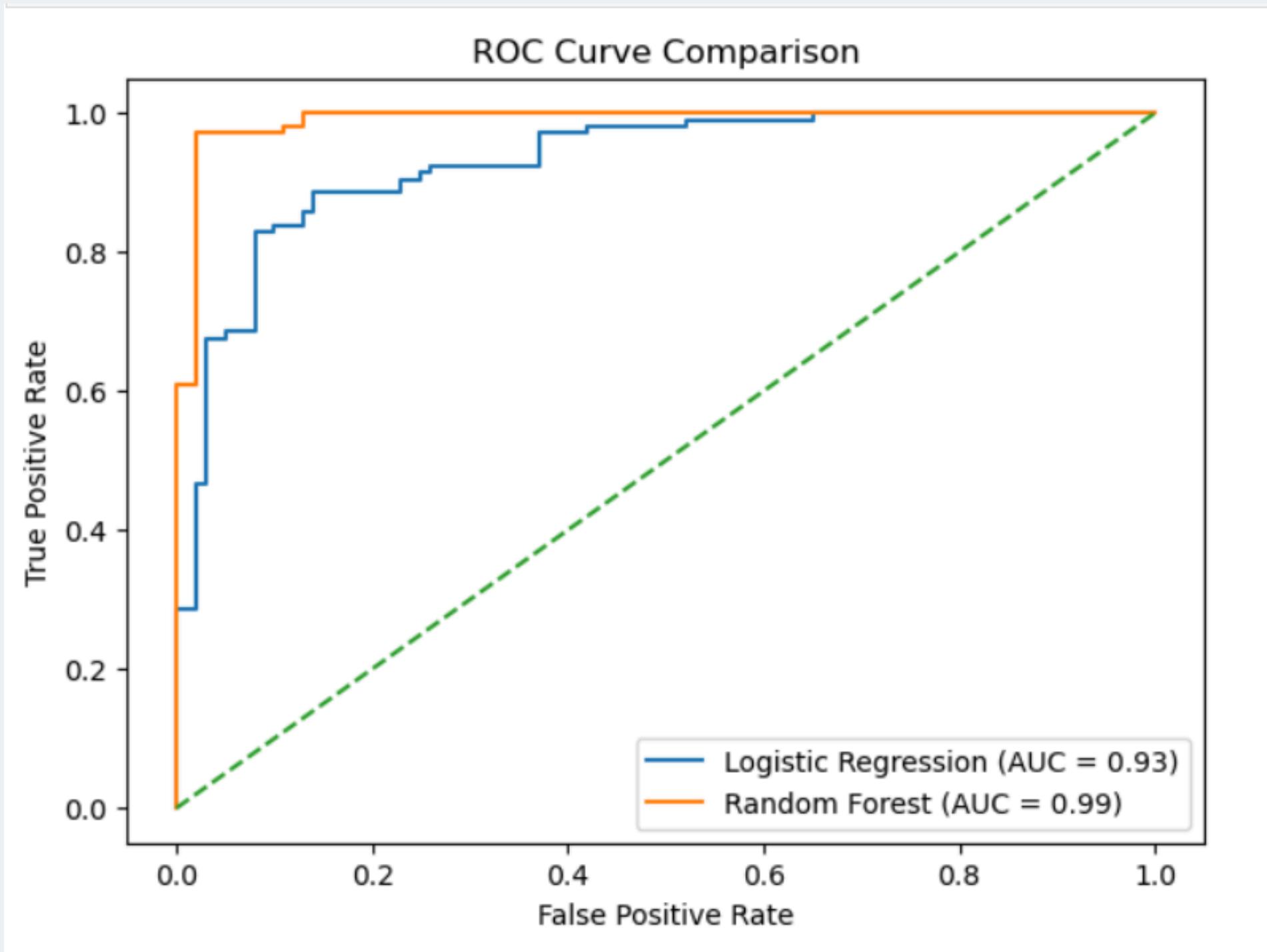
Model	Accuracy	Recall	ROC-AUC
Logistic Regression	~82%	~92%	~0.93
Random Forest	~97%	~97%	~0.99



ROC Curve Comparison

07

ROC curves demonstrate model performance across thresholds.



Random Forest significantly outperforms the baseline model in classification quality.

08

Streamlit Web App

- Real-time predictions
- Model selection (LR / RF)
- Interactive sliders & inputs
- Probability-based risk output

 About This App



This app predicts whether a person is likely to have heart disease using a Logistic Regression and Random Forest.

Heart-Healthy Lifestyle Tips:

- Regular health check-ups
- Balanced diet (low fat & low salt)
- Exercise at least 30 minutes daily
- Monitor blood pressure & cholesterol
- Avoid smoking and excess alcohol

This is for educational purposes only
Not a substitute for professional medical advice

AI-Based Heart Disease Risk Prediction System

 Select Prediction Model

Random Forest Classifier (Best Performance)

Personal Information

Age: 54

Sex: Male

Heart Metrics

Chest Pain Type: Typical Angina

Resting Blood Pressure (mm Hg): 140

Cholesterol (mg/dl): 239

Fasting Blood Sugar > 120 mg/dl: No

Resting ECG: ST-T Abnormality

Exercise & Vessels

Max Heart Rate: 160

Exercise Induced Angina: No

ST Depression: 1.20

Slope of Peak Exercise ST: Downsloping

Number of Major Vessels (0-3): 0

Thalassemia: Fixed Defect

 Predict

Risk Interpretation

- Probability breakdown
- Risk-level gauge indicator
- Clear medical-style alerts

