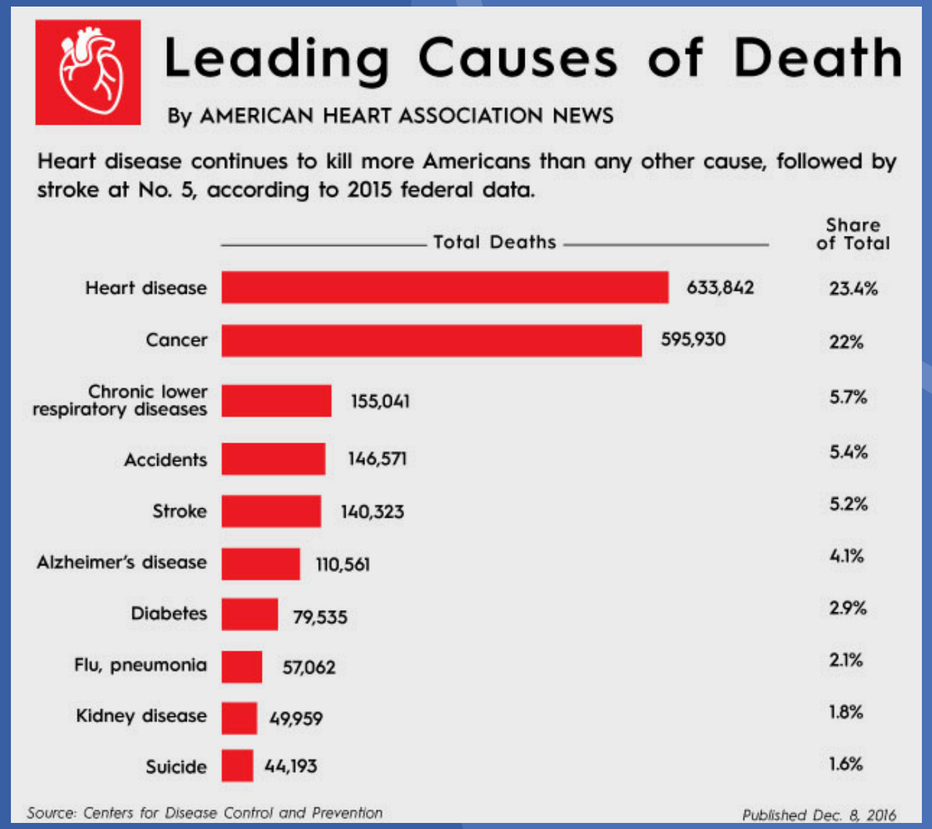

PREVENTI-SCAN
AI Heart Disease Detector

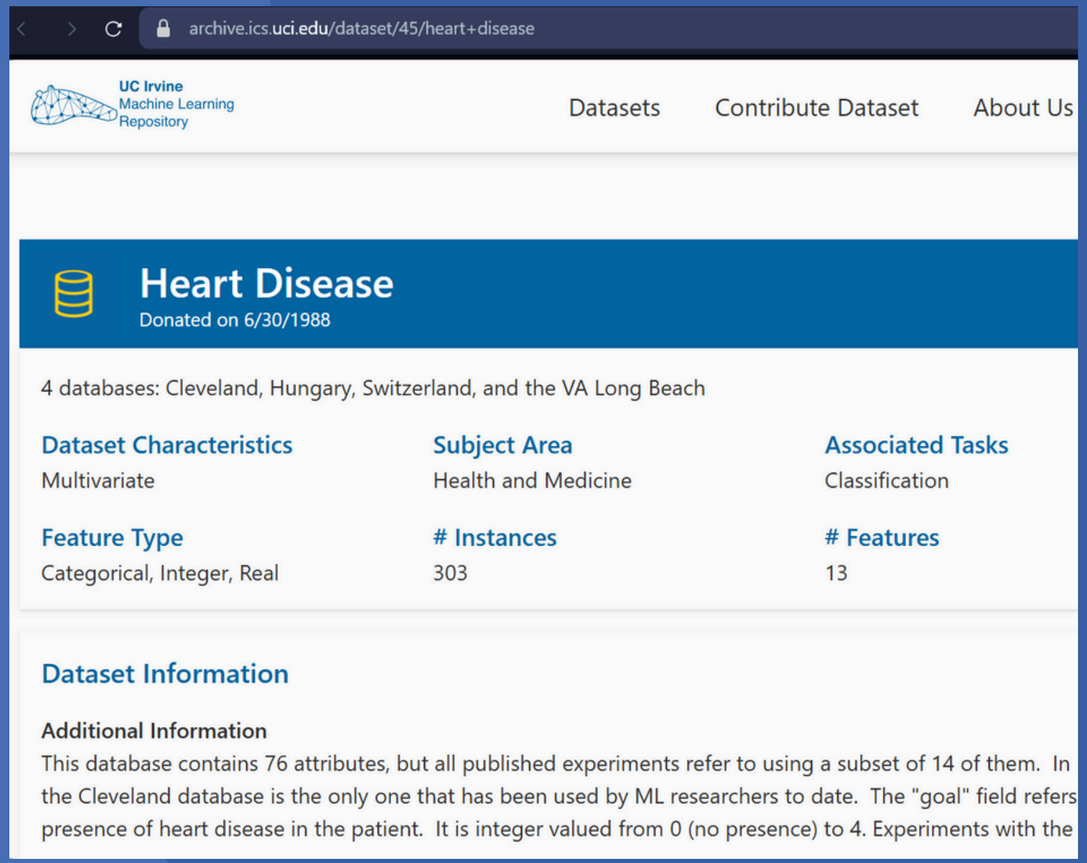
The Vision & Purpose



- Heart disease is the #1 cause of death in the world.
- Many people don't know they are at risk.
- Doctors don't have time to check every patient manually.
- I built an AI to predict risk from patient data in seconds.
- This can help save lives with faster and smarter decisions.

How I Prepared the Data

- Data from real patients at Cleveland Clinic (Converted to CSV file)
- Total of 297 patient records
- 13 health features like age, cholesterol, heart rate, chest pain
- Cleaned using Python and pandas
- Target column shows if a person has risk (1) or no risk (0)

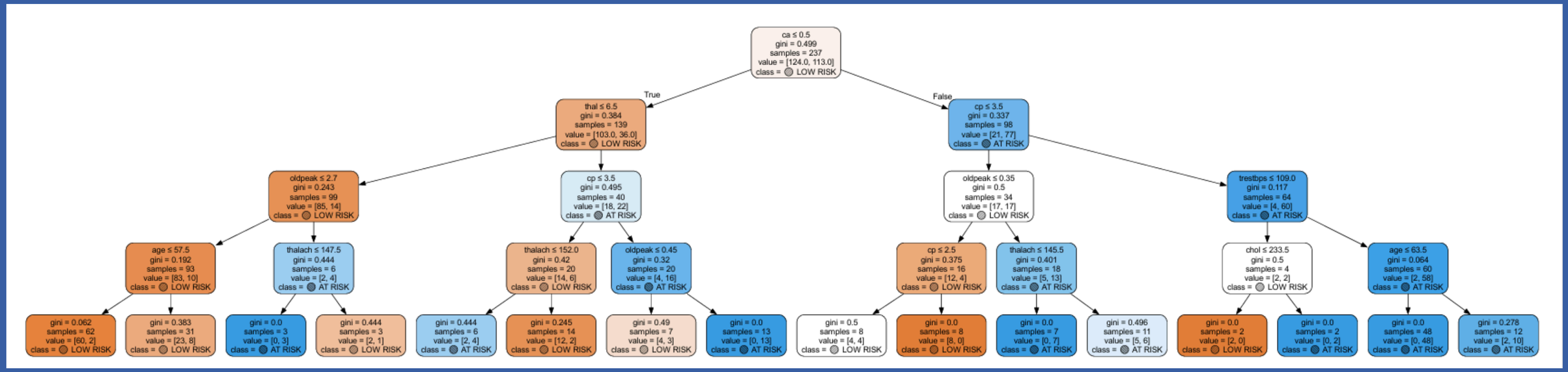


How the AI Thinks: The Decision Tree

- The decision tree is trained using real patient data
- It learns to ask yes/no health questions like “Is cholesterol > 240?”
- Each branch splits based on answers to these questions
- At the end of each path, it gives a result: 🔵 AT RISK or 🟠 LOW RISK
- This part of the code creates and draws the tree using scikit-learn + Graphviz

```
35
36  # ✅ Step 8: Train decision tree
37  clf = DecisionTreeClassifier(max_depth=4)
38  clf.fit(X_train, y_train)
39
40  # ✅ Step 9: Visualize tree
41  dot_data = export_graphviz(
42      clf,
43      out_file=None,
44      feature_names=X.columns,
45      class_names=["🟠 LOW RISK", "🔵 AT RISK"],
46      filled=True,
47      rounded=True,
48      special_characters=True
49  )
50  graph = graphviz.Source(dot_data)
51  graph.render("PreventiScan_Heart_Tree")
52  graph.view()
53
54  # ✅ Step 10: Predict patient risk
55  df['PredictedRisk'] = clf.predict(X)
56  df['PredictedRisk'] = df['PredictedRisk'].apply(lambda x: "🔵 AT RISK" if x == 1 else "🟠 LOW RISK"
57
58  # ✅ Step 11: Show risk summary
59  total = len(df)
60  at_risk = df[df['PredictedRisk'] == "🔵 AT RISK"]
```

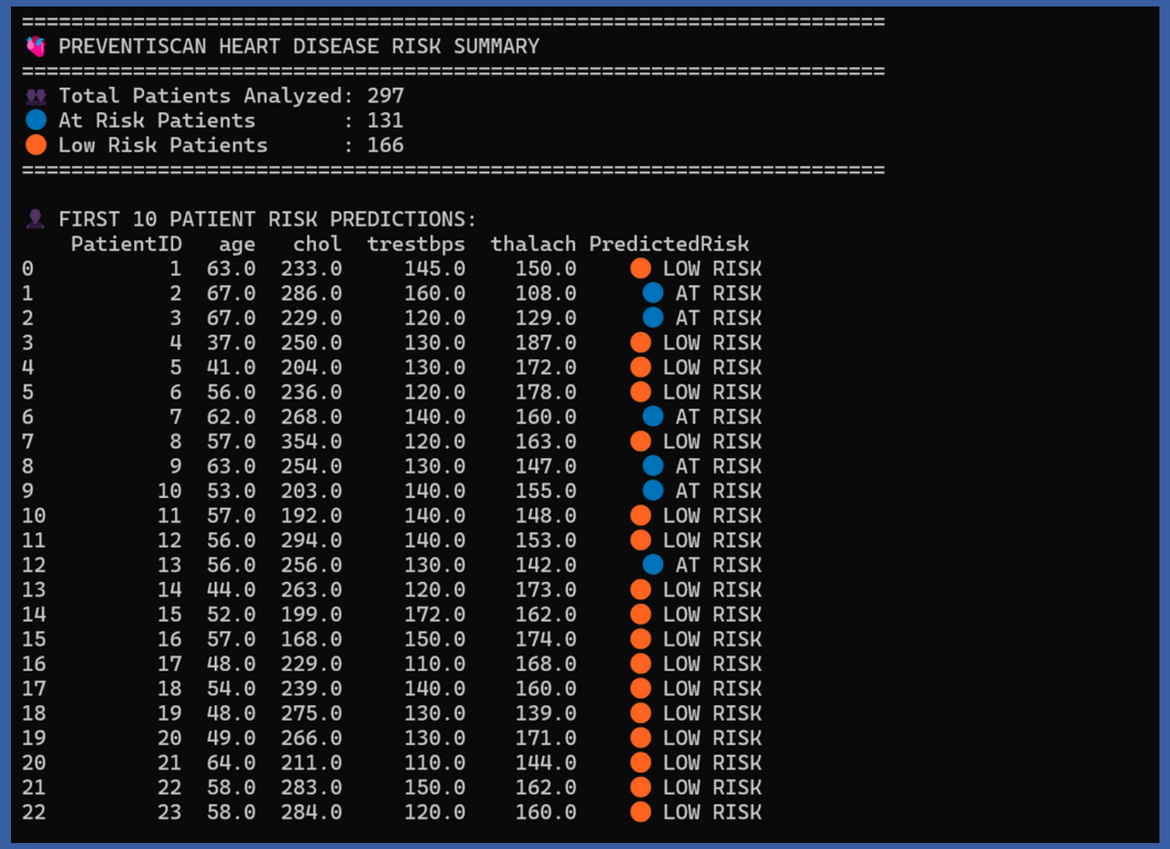
Desicion Tree



- The AI moves through the tree until it finds a final result.
  - 🔵 Blue boxes = At Risk
  - 🟠 Orange boxes = Low Risk

Risk Prediction Results

- The AI analyzed 297 patients from the dataset
- It found 131 patients At Risk and 166 Low Risk
- Each patient got a risk label using medical data
- This helps doctors see who needs urgent care first
- The system is fast, smart, and can scale to millions



```
================================================================================
💓 PREVENTISCAN HEART DISEASE RISK SUMMARY
================================================================================
👥 Total Patients Analyzed: 297
🔵 At Risk Patients       : 131
🟠 Low Risk Patients      : 166
================================================================================

👤 FIRST 10 PATIENT RISK PREDICTIONS:
    PatientID   age   chol  trestbps  thalach PredictedRisk
0           1  63.0  233.0     145.0    150.0     🟠 LOW RISK
1           2  67.0  286.0     160.0    108.0      🔵 AT RISK
2           3  67.0  229.0     120.0    129.0      🔵 AT RISK
3           4  37.0  250.0     130.0    187.0     🟠 LOW RISK
4           5  41.0  204.0     130.0    172.0     🟠 LOW RISK
5           6  56.0  236.0     120.0    178.0     🟠 LOW RISK
6           7  62.0  268.0     140.0    160.0      🔵 AT RISK
7           8  57.0  354.0     120.0    163.0     🟠 LOW RISK
8           9  63.0  254.0     130.0    147.0      🔵 AT RISK
9          10  53.0  203.0     140.0    155.0      🔵 AT RISK
10         11  57.0  192.0     140.0    148.0     🟠 LOW RISK
11         12  56.0  294.0     140.0    153.0     🟠 LOW RISK
12         13  56.0  256.0     130.0    142.0      🔵 AT RISK
13         14  44.0  263.0     120.0    173.0     🟠 LOW RISK
14         15  52.0  199.0     172.0    162.0     🟠 LOW RISK
15         16  57.0  168.0     150.0    174.0     🟠 LOW RISK
16         17  48.0  229.0     110.0    168.0     🟠 LOW RISK
17         18  54.0  239.0     140.0    160.0     🟠 LOW RISK
18         19  48.0  275.0     130.0    139.0     🟠 LOW RISK
19         20  49.0  266.0     130.0    171.0     🟠 LOW RISK
20         21  64.0  211.0     110.0    144.0     🟠 LOW RISK
21         22  58.0  283.0     150.0    162.0     🟠 LOW RISK
22         23  58.0  284.0     120.0    160.0     🟠 LOW RISK
```

Why This Matters

- This AI can help doctors save time and lives
- Can be used in hospitals, clinics, or mobile apps
- Gives instant health risk feedback from raw data
- Can be trained on more diseases in the future

References & Resources

Dataset Source:
UCI Heart Disease Dataset.
Python Libraries Used:
pandas, scikit-learn, graphviz.
Data Cleaning:
Used pandas to clean and prepare real patient records.
Model Used:
Built a DecisionTreeClassifier with scikit-learn.
Code Developed By:
Faiaz Ahmed, PreventiScan AI Project (2025).

THANK YOU