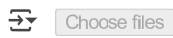```
from google.colab import files
uploaded = files.upload()
```

Choose files No file chosen     Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.
Saving heart_s.csv to heart_s.csv

```
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import classification_report
import joblib
import pandas as pd
df = pd.read_csv("heart_s.csv")  # Use exact uploaded name
print(df.columns.tolist())


# Select features and label
X = df[["Age", "RestingBP", "Cholesterol", "MaxHR", "Oldpeak"]]
y = df["HeartDisease"]

# Split the dataset
X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.2, random_state=42
)

# Train a Random Forest Classifier
model = RandomForestClassifier(n_estimators=100, random_state=42)
model.fit(X_train, y_train)

# Evaluate the model
y_pred = model.predict(X_test)
print("\n📊 Classification Report:\n")
print(classification_report(y_test, y_pred))

# Save the trained model
joblib.dump(model, "heart_disease_monitor.pkl")
print("✅ Model saved as 'heart_disease_monitor.pkl'")
```

['Age', 'Sex', 'ChestPainType', 'RestingBP', 'Cholesterol', 'FastingBS', 'RestingECG', 'MaxHR', 'ExerciseAngina', 'Oldpeak', 'ST_Slope',

📊 Classification Report:

	precision	recall	f1-score	support
0	0.69	0.75	0.72	77
1	0.81	0.76	0.78	107
accuracy			0.76	184
macro avg	0.75	0.76	0.75	184
weighted avg	0.76	0.76	0.76	184

✅ Model saved as 'heart_disease_monitor.pkl'

```
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier

# Split dataset
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Train model
model = RandomForestClassifier(n_estimators=100, random_state=42)
model.fit(X_train, y_train)
```

▼   RandomForestClassifier   ⓘ ⓒ
    RandomForestClassifier(random_state=42)

```
import joblib

# Save model
joblib.dump(model, "heart_disease_monitor.pkl")
```

```
print("✅ Model saved as 'heart_disease_monitor.pkl'")
```

✅ Model saved as 'heart_disease_monitor.pkl'

```
files.download("heart_disease_monitor.pkl")
```

```
!pip install streamlit
!pip install pyngrok
!pip install scikit-learn pandas joblib
```

```
Collecting streamlit
  Downloading streamlit-1.45.1-py3-none-any.whl.metadata (8.9 kB)
Requirement already satisfied: altair<6,>=4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (5.5.0)
Requirement already satisfied: blinker<2,>=1.5.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (1.9.0)
Requirement already satisfied: cachetools<6,>=4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (5.5.2)
Requirement already satisfied: click<9,>=7.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (8.2.1)
Requirement already satisfied: numpy<3,>=1.23 in /usr/local/lib/python3.11/dist-packages (from streamlit) (2.0.2)
Requirement already satisfied: packaging<25,>=20 in /usr/local/lib/python3.11/dist-packages (from streamlit) (24.2)
Requirement already satisfied: pandas<3,>=1.4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (2.2.2)
Requirement already satisfied: pillow<12,>=7.1.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (11.2.1)
Requirement already satisfied: protobuf<7,>=3.20 in /usr/local/lib/python3.11/dist-packages (from streamlit) (5.29.5)
Requirement already satisfied: pyarrow>=7.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (18.1.0)
Requirement already satisfied: requests<3,>=2.27 in /usr/local/lib/python3.11/dist-packages (from streamlit) (2.32.3)
Requirement already satisfied: tenacity<10,>=8.1.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (9.1.2)
Requirement already satisfied: toml<2,>=0.10.1 in /usr/local/lib/python3.11/dist-packages (from streamlit) (0.10.2)
Requirement already satisfied: typing-extensions<5,>=4.4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (4.14.0)
Collecting watchdog<7,>=2.1.5 (from streamlit)
  Downloading watchdog-6.0.0-py3-none-manylinux2014_x86_64.whl.metadata (44 kB)
                                        44.3/44.3 kB 1.8 MB/s eta 0:00:00
Requirement already satisfied: gitpython!=3.1.19,<4,>=3.0.7 in /usr/local/lib/python3.11/dist-packages (from streamlit) (3.1.44)
Collecting pydeck<1,>=0.8.0b4 (from streamlit)
  Downloading pydeck-0.9.1-py2.py3-none-any.whl.metadata (4.1 kB)
Requirement already satisfied: tornado<7,>=6.0.3 in /usr/local/lib/python3.11/dist-packages (from streamlit) (6.4.2)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.11/dist-packages (from altair<6,>=4.0->streamlit) (3.1.6)
Requirement already satisfied: jsonschema>=3.0 in /usr/local/lib/python3.11/dist-packages (from altair<6,>=4.0->streamlit) (4.24.0)
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Requirement already satisfied: gitdb<5,>=4.0.1 in /usr/local/lib/python3.11/dist-packages (from gitpython!=3.1.19,<4,>=3.0.7->streaml
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Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit) (2.4
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit) (202
Requirement already satisfied: smmap<6,>=3.0.1 in /usr/local/lib/python3.11/dist-packages (from gitdb<5,>=4.0.1->gitpython!=3.1.19,<4
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.11/dist-packages (from jinja2->altair<6,>=4.0->streamlit) (3
Requirement already satisfied: attrs>=22.2.0 in /usr/local/lib/python3.11/dist-packages (from jsonschema>=3.0->altair<6,>=4.0->stream
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /usr/local/lib/python3.11/dist-packages (from jsonschema>=3.0-
Requirement already satisfied: referencing>=0.28.4 in /usr/local/lib/python3.11/dist-packages (from jsonschema>=3.0->altair<6,>=4.0->
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Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.8.2->pandas<3,>=1.4.0->st
Downloading streamlit-1.45.1-py3-none-any.whl (9.9 MB)
                                        9.9/9.9 MB 64.7 MB/s eta 0:00:00
Downloading pydeck-0.9.1-py2.py3-none-any.whl (6.9 MB)
                                        6.9/6.9 MB 94.7 MB/s eta 0:00:00
Downloading watchdog-6.0.0-py3-none-manylinux2014_x86_64.whl (79 kB)
                                        79.1/79.1 kB 5.4 MB/s eta 0:00:00
Installing collected packages: watchdog, pydeck, streamlit
Successfully installed pydeck-0.9.1 streamlit-1.45.1 watchdog-6.0.0
Collecting pyngrok
  Downloading pyngrok-7.2.11-py3-none-any.whl.metadata (9.4 kB)
Requirement already satisfied: PyYAML>=5.1 in /usr/local/lib/python3.11/dist-packages (from pyngrok) (6.0.2)
Downloading pyngrok-7.2.11-py3-none-any.whl (25 kB)
Installing collected packages: pyngrok
Successfully installed pyngrok-7.2.11
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.11/dist-packages (1.6.1)
Requirement already satisfied: pandas in /usr/local/lib/python3.11/dist-packages (2.2.2)
```

```
%%writefile app.py
import streamlit as st
import pandas as pd
import joblib

# Load the model
model = joblib.load("heart_disease_monitor.pkl")
```

```python
st.title("🩺 AI Heart Disease Risk Predictor")

# Input fields
age = st.number_input("Age", min_value=1, max_value=120)
bp = st.number_input("Resting Blood Pressure")
chol = st.number_input("Cholesterol Level")
maxhr = st.number_input("Max Heart Rate")
oldpeak = st.number_input("Oldpeak (ST depression induced)")

# Prediction
if st.button("Predict"):
    input_df = pd.DataFrame([{
        "Age": age,
        "RestingBP": bp,
        "Cholesterol": chol,
        "MaxHR": maxhr,
        "Oldpeak": oldpeak
    }])
    prediction = model.predict(input_df)[0]
    if prediction == 1:
        st.error("⚠️ High Risk: Heart Disease Detected!")
    else:
        st.success("✅ Low Risk: No Heart Disease Detected.")
```

⤓ Writing app.py

```python
from pyngrok import ngrok

ngrok.set_auth_token("2yMOmOINEBeuNAlLEbi6BxZGa42_3WiArXNuJNqdJFSoPjttz")
```

⤓

```python
!pip install -q streamlit pyngrok

!ngrok config add-authtoken 2yMOmOINEBeuNAlLEbi6BxZGa42_3WiArXNuJNqdJFSoPjttz
```

⤓ Authtoken saved to configuration file: /root/.config/ngrok/ngrok.yml

```python
from pyngrok import ngrok
import os

# Kill any existing streamlit process
os.system("pkill streamlit")

# Run streamlit app in background
os.system("streamlit run app.py &")

# ✅ Open ngrok tunnel for port 8501 (Streamlit default)
public_url = ngrok.connect(8501)
print(f"🚀 Streamlit app running at: {public_url}")
```

⤓ 🚀 Streamlit app running at: NgrokTunnel: "https://bd7e-35-229-33-183.ngrok-free.app" -> "http://localhost:8501"