

HEART DISEASE PREDICTION

Group 5:

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PROJECT FLOW

STEP
01

Dataset: Preprocessing

Model Deploiment

STEP
02

STEP
03

ML Flow: Tracking

Dockerization

STEP
04

STEP
05

Cloud Deployment

DATASET

| age | sex | chest_pain_type | resting_blood_pressure | cholestorol | fasting_blood_sugar | rest_ecg | Max_heart_rate | exercise_induced_angina | oldpeak | slope | vessels_colored_by_flourosopy | thalassemia | target |
|-----|--------|------------------|------------------------|-------------|------------------------|------------------------------|----------------|-------------------------|---------|-------------|-------------------------------|-------------------|--------|
| 52 | Male | Typical angina | 125 | 212 | Lower than 120 mg/ml | ST-T wave abnormality | 168 | No | 1 | Downsloping | Two | Reversable Defect | 0 |
| 53 | Male | Typical angina | 140 | 203 | Greater than 120 mg/ml | Normal | 155 | Yes | 3.1 | Upsloping | Zero | Reversable Defect | 0 |
| 70 | Male | Typical angina | 145 | 174 | Lower than 120 mg/ml | ST-T wave abnormality | 125 | Yes | 2.6 | Upsloping | Zero | Reversable Defect | 0 |
| 61 | Male | Typical angina | 148 | 203 | Lower than 120 mg/ml | ST-T wave abnormality | 161 | No | 0 | Downsloping | One | Reversable Defect | 0 |
| 62 | Female | Typical angina | 138 | 294 | Greater than 120 mg/ml | ST-T wave abnormality | 106 | No | 1.9 | Flat | Three | Fixed Defect | 0 |
| 58 | Female | Typical angina | 100 | 248 | Lower than 120 mg/ml | Normal | 122 | No | 1 | Flat | Zero | Fixed Defect | 1 |
| 58 | Male | Typical angina | 114 | 318 | Lower than 120 mg/ml | Left ventricular hypertrophy | 140 | No | 4.4 | Upsloping | Three | Normal | 0 |
| 55 | Male | Typical angina | 160 | 289 | Lower than 120 mg/ml | Normal | 145 | Yes | 0.8 | Flat | One | Reversable Defect | 0 |
| 46 | Male | Typical angina | 120 | 249 | Lower than 120 mg/ml | Normal | 144 | No | 0.8 | Downsloping | Zero | Reversable Defect | 0 |
| 54 | Male | Typical angina | 122 | 286 | Lower than 120 mg/ml | Normal | 116 | Yes | 3.2 | Flat | Two | Fixed Defect | 0 |
| 71 | Female | Typical angina | 112 | 149 | Lower than 120 mg/ml | ST-T wave abnormality | 125 | No | 1.6 | Flat | Zero | Fixed Defect | 1 |
| 43 | Female | Typical angina | 132 | 341 | Greater than 120 mg/ml | Normal | 136 | Yes | 3 | Flat | Zero | Reversable Defect | 0 |
| 34 | Female | Atypical angina | 118 | 210 | Lower than 120 mg/ml | ST-T wave abnormality | 192 | No | 0.7 | Downsloping | Zero | Fixed Defect | 1 |
| 51 | Male | Typical angina | 140 | 298 | Lower than 120 mg/ml | ST-T wave abnormality | 122 | Yes | 4.2 | Flat | Three | Reversable Defect | 0 |
| 52 | Male | Typical angina | 128 | 204 | Greater than 120 mg/ml | ST-T wave abnormality | 156 | Yes | 1 | Flat | Zero | No | 0 |
| 34 | Female | Atypical angina | 118 | 210 | Lower than 120 mg/ml | ST-T wave abnormality | 192 | No | 0.7 | Downsloping | Zero | Fixed Defect | 1 |
| 51 | Female | Non-anginal pain | 140 | 308 | Lower than 120 mg/ml | Normal | 142 | No | 1.5 | Downsloping | One | Fixed Defect | 1 |
| 54 | Male | Typical angina | 124 | 266 | Lower than 120 mg/ml | Normal | 109 | Yes | 2.2 | Flat | One | Reversable Defect | 0 |
| 50 | Female | Atypical angina | 120 | 244 | Lower than 120 mg/ml | ST-T wave abnormality | 162 | No | 1.1 | Downsloping | Zero | Fixed Defect | 1 |
| 58 | Male | Non-anginal pain | 140 | 211 | Greater than 120 mg/ml | Normal | 165 | No | 0 | Downsloping | Zero | Fixed Defect | 1 |
| 60 | Male | Non-anginal pain | 140 | 185 | Lower than 120 mg/ml | Normal | 155 | No | 3 | Flat | Zero | Fixed Defect | 0 |
| 67 | Female | Typical angina | 106 | 223 | Lower than 120 mg/ml | ST-T wave abnormality | 142 | No | 0.3 | Downsloping | Two | Fixed Defect | 1 |
| 45 | Male | Typical angina | 104 | 208 | Lower than 120 mg/ml | Normal | 148 | Yes | 3 | Flat | Zero | Fixed Defect | 1 |
| 63 | Female | Non-anginal pain | 135 | 252 | Lower than 120 mg/ml | Normal | 172 | No | 0 | Downsloping | Zero | Fixed Defect | 1 |
| 42 | Female | Non-anginal pain | 120 | 209 | Lower than 120 mg/ml | ST-T wave abnormality | 173 | No | 0 | Flat | Zero | Fixed Defect | 1 |
| 61 | Female | Typical angina | 145 | 307 | Lower than 120 mg/ml | Normal | 146 | Yes | 1 | Flat | Zero | Reversable Defect | 0 |

No of Rows: 14

No of Columns: 1025

Column Name: **Description**

age: Age of the patient (in years).

sex: Gender of the patient (1 = male, 0 = female).

chest_pain_type: Type of chest pain (e.g., typical angina, atypical angina, non-anginal pain, asymptomatic).

resting_blood_pressure: Resting blood pressure (in mm Hg).

cholestorol: Serum cholesterol level (in mg/dl).

fasting_blood_sugar: Fasting blood sugar > 120 mg/dl (1 = true, 0 = false).

rest_ecg: Resting electrocardiographic results (e.g., normal, ST-T abnormality, LV hypertrophy).

Max_heart_rate: Maximum heart rate achieved during exercise.

exercise_induced_angina: Exercise-induced angina (1 = yes, 0 = no).

oldpeak: Depression induced by exercise relative to rest (ST depression).

slope: Slope of the peak exercise ST segment (upsloping, flat, downsloping).

vessels_colored_by_flourosopy: Number of major vessels colored by fluoroscopy (0-3).

thalassemia: A blood disorder (e.g., normal, fixed defect, reversible defect).

target: Diagnosis of heart disease (1 = disease present, 0 = no disease).

ML FLOW MODEL

mlflow 3.4.0

+ New

Experiments

Models

Prompts

Experiments

Create

Compare

Delete

Filter experiments by name

Q

Tag filter

| <input type="checkbox"/> | Name | Time created | Last modified | Description | Tags |
|--------------------------|--|-------------------------|-------------------------|-------------|------|
| <input type="checkbox"/> | Heart Disease Prediction Pipeline Com... | 09/28/2025, 12:20:46 PM | 09/28/2025, 12:20:46 PM | - | |
| <input type="checkbox"/> | Default | 09/28/2025, 12:20:46 PM | 09/28/2025, 12:20:46 PM | - | |

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Next >

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ML FLOW TRACKING

mlflow3.4.0

+ New

Experiments

Models

Prompts

Experiments

Heart Disease Prediction...

Machine learning

Runs

Models

Traces

Share

metrics.rmse < 1 and params.model = "tree"

Time created

State: Active

Datasets

Sort: Created

+ New run

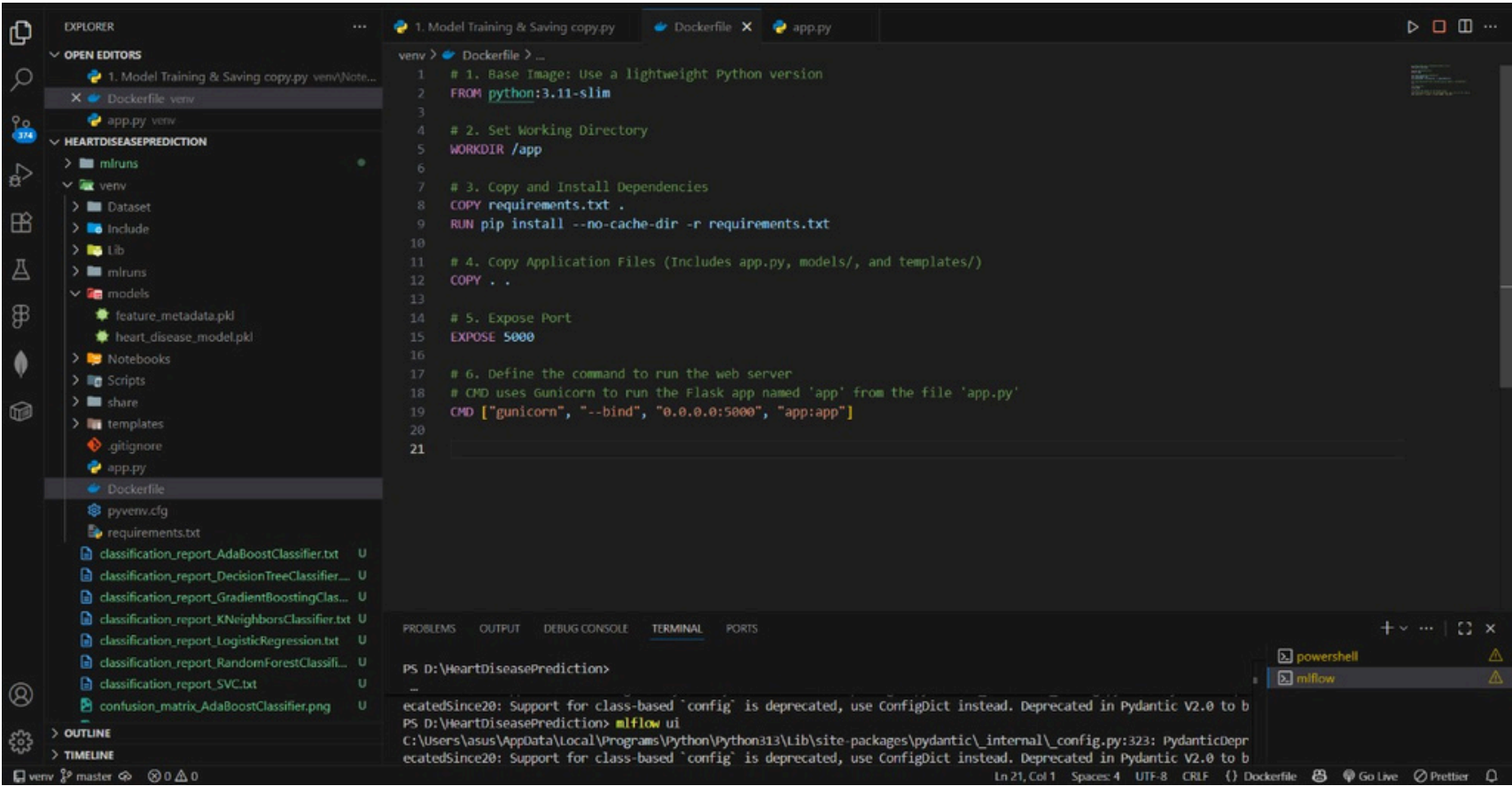
Columns

Group by

| | Run Name | Created | Dataset | Duration | Source | Models |
|--------------------------|----------------------------|---------------|---------|----------|-------------|-------------------------|
| <input type="checkbox"/> | Production_Model_Final_... | 8 minutes ago | - | 10.4s | d:\Heart... | production_model |
| <input type="checkbox"/> | GradientBoostingClassifier | 8 minutes ago | - | 8.5s | d:\Heart... | model_pipeline_artifact |
| <input type="checkbox"/> | AdaBoostClassifier | 8 minutes ago | - | 9.2s | d:\Heart... | model_pipeline_artifact |
| <input type="checkbox"/> | RandomForestClassifier | 9 minutes ago | - | 8.8s | d:\Heart... | model_pipeline_artifact |
| <input type="checkbox"/> | DecisionTreeClassifier | 9 minutes ago | - | 9.1s | d:\Heart... | model_pipeline_artifact |
| <input type="checkbox"/> | KNeighborsClassifier | 9 minutes ago | - | 9.9s | d:\Heart... | model_pipeline_artifact |
| <input type="checkbox"/> | SVC | 9 minutes ago | - | 10.0s | d:\Heart... | model_pipeline_artifact |
| <input type="checkbox"/> | LogisticRegression | 9 minutes ago | - | 28.7s | d:\Heart... | model_pipeline_artifact |

8 matching runs

DOCKERIZATION

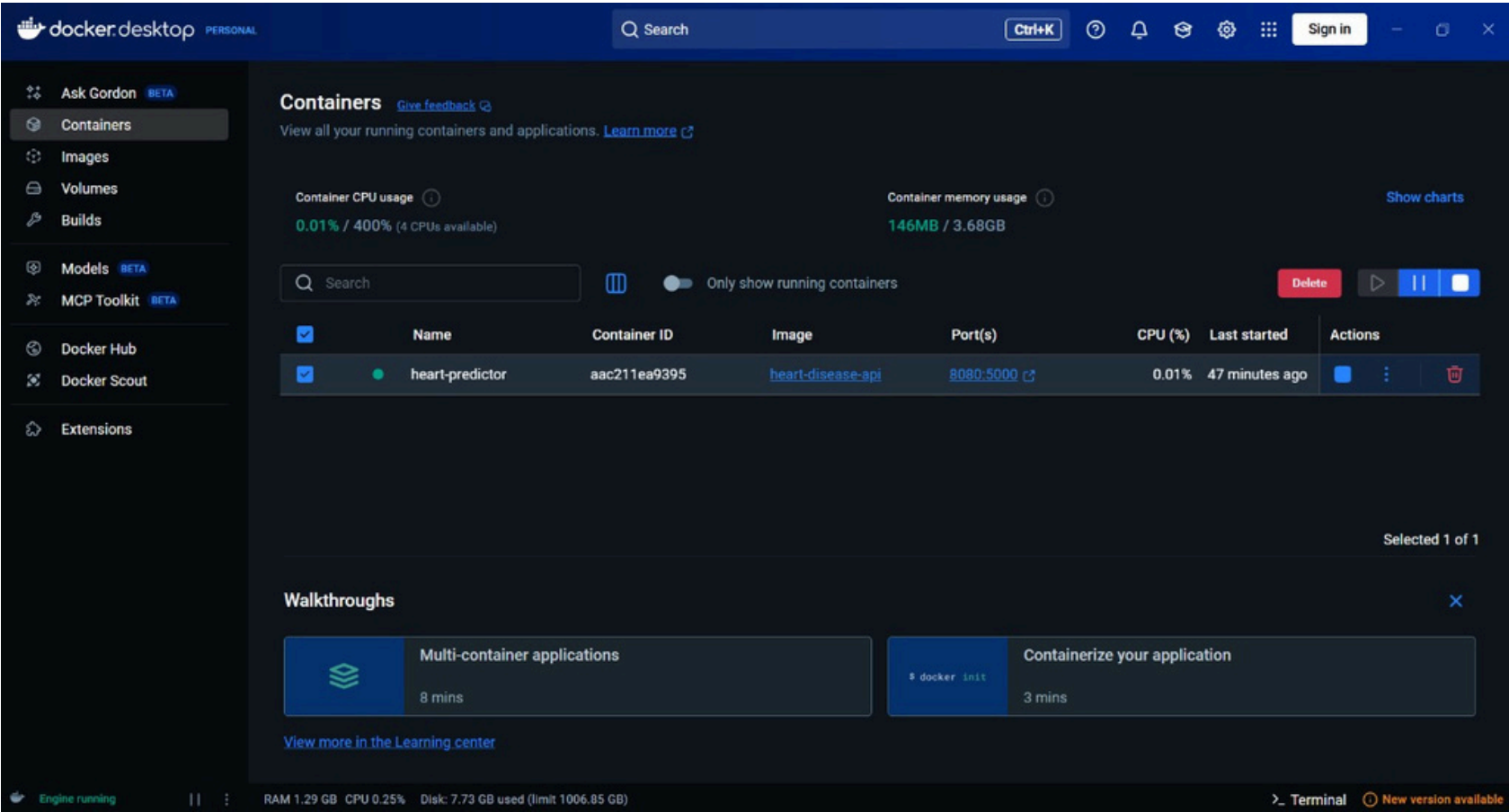


The screenshot shows a VS Code editor with a project named 'HEARTDISEASEPREDICTION'. The Explorer sidebar on the left shows the project structure, including files like 'feature_metadata.pkl', 'heart_disease_model.pkl', and 'Dockerfile'. The Dockerfile is open in the editor, showing the following content:

```
1 # 1. Base Image: Use a lightweight Python version
2 FROM python:3.11-slim
3
4 # 2. Set Working Directory
5 WORKDIR /app
6
7 # 3. Copy and Install Dependencies
8 COPY requirements.txt .
9 RUN pip install --no-cache-dir -r requirements.txt
10
11 # 4. Copy Application Files (Includes app.py, models/, and templates/)
12 COPY . .
13
14 # 5. Expose Port
15 EXPOSE 5000
16
17 # 6. Define the command to run the web server
18 # CMD uses Gunicorn to run the Flask app named 'app' from the file 'app.py'
19 CMD ["gunicorn", "--bind", "0.0.0.0:5000", "app:app"]
20
21
```


The terminal at the bottom shows the command prompt in 'PS D:\HeartDiseasePrediction>' and the output of running 'mlflow ui', which includes a deprecation warning about 'config' in Pydantic V2.0.

DOCKER FILE



CONTAINER

USER INTERFACE

 **Heart Disease Prediction**

| | |
|--------------------------------------|---------------------------|
| Age (Years): | <input type="text"/> |
| Sex: | <div>Male</div> |
| Chest Pain Type: | <div>Typical angina</div> |
| Resting Blood Pressure (mm Hg): | <input type="text"/> |
| Cholesterol (mg/dl): | <input type="text"/> |
| Fasting Blood Sugar > 120 mg/ml: | <div>Yes</div> |
| Resting ECG Results: | <div>Normal</div> |
| Max Heart Rate Achieved: | <input type="text"/> |
| Exercise Induced Angina: | <div>Yes</div> |
| Oldpeak (ST depression): | <input type="text"/> |
| ST Segment Slope: | <div>Downsloping</div> |
| Major Vessels Colored by Flourosopy: | <div>0</div> |
| Thalassemia: | <div>Normal</div> |

Predict Heart Disease

Prediction Result:
Diagnosis: Absence of Heart Disease
Probability (No Disease): 59.17%
Probability (Disease): 40.83%

LINK: <http://localhost:8080/>

RENDERING STEPS

Step 1: Prepare GitHub Repository

First, ensure your project is complete and pushed to GitHub:

1. **Verify Project Structure:** Confirm your project's root folder contains the following essential files and folders:

- app.py
- Dockerfile
- requirements.txt
- models/ (containing .pkl files)
- templates/ (containing index.html)

PREPARING GIT REPOSITORY

MLops project

Projects

Search

+ New

Upgrade

Help

Create a new Service

Choose service

Configure

Deploy

What's to use?

Static Sites

Static content served over a global CDN. Ideal for frontend, blogs, and content sites.

New Static Site →

Web Services

Dynamic web app. Ideal for full-stack apps, API servers, and mobile backends.

New Web Service →

Private Services

Web app hosted on a private network, accessible only from your other Render services.

New Private Service →

Background Workers

Long-lived services that process async tasks, usually from a job queue.

New Worker →

Cron Jobs

Short-lived tasks that run on a periodic schedule.

New Cron Job →

Postgres

Relational data storage. Supports point-in-time recovery, read replicas, and high availability.

New Postgres →

Key Value

Managed Redis®-compatible storage. Ideal for use as a shared cache, message broker, or job queue.

New Key Value Instance →

SELECTING WEB SERVICES

MLops project

New Web Service

Search

+ New

Upgrade

Help

Configure and deploy your new Web Service

Choose service

Configure

Deploy

Need help? Docs

Source Code

Git Provider

Public Git Repository

Existing Image

Connect Git provider

Connect your Git provider to deploy from your existing repositories.

GitHub

GitLab

Bitbucket

Name

A unique name for your web service.

render-xxxx-xxxx-xxxx

Project

Optional

Add this web service to a project once it's created.

CONNECTING TO GITHUB REPOSITORY

MLops project

New Web Service

Search

+ New

Upgrade

Help

Configure and deploy your new Web Service

Choose service

Configure

Deploy

Need help? Docs

Source Code

yugate13 / mlops_project · 6h ago

Edit

Name

A unique name for your web service.

mlops_project

Project

Optional

Add this web service to a project once it's created.

Create a new project to add this to?

You don't have any projects in this workspace. Projects allow you to group resources into environments so you can better manage related resources.

+ Create a project

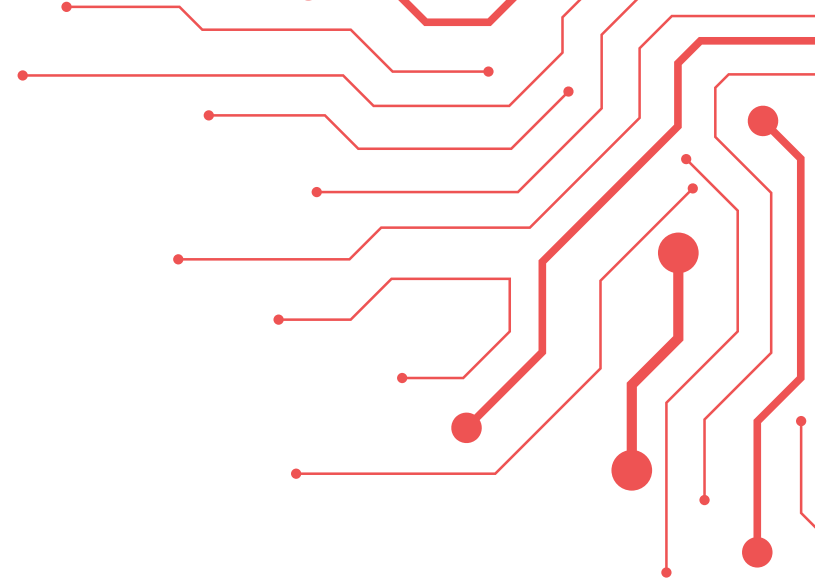
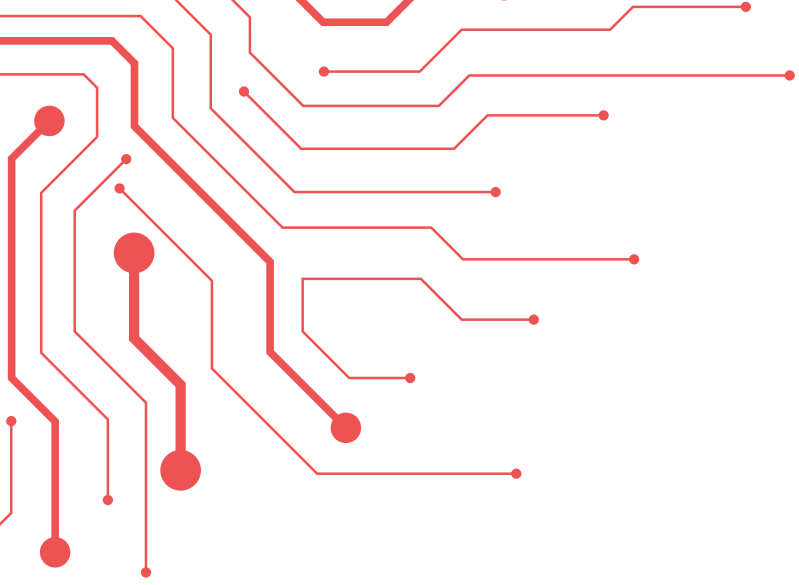
CONFIGURING DEPLOYMENT

| Setting | Value to Select | Reason |
|---------------|--|---|
| Service Name | A unique name (e.g., heart-disease-predictor) | This will be part of your live URL. |
| Region | Select a region geographically close to you. | Improves latency. |
| Branch | main | The branch containing the code you want to deploy. |
| Environment | Docker (Select this explicitly) | This tells Render to ignore standard Python builds and use your Dockerfile . |
| Build Command | Leave Blank | Docker uses the instructions inside your Dockerfile . |
| Start Command | Leave Blank | Docker uses the CMD instruction from your Dockerfile (gunicorn app:app). |
| Instance Type | Free | Suitable for testing and personal projects. <i>Note: Free instances spin down after 15 minutes of inactivity.</i> |

DEPLOYING WEB SERVICES

> Advanced

Deploy Web Service



THANK YOU

