

Prediction of heart disease

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Objective

We want to create a model that predicts whether a person has a high risk of heart disease by taking into account certain demographic and diagnostic metrics of the individual.

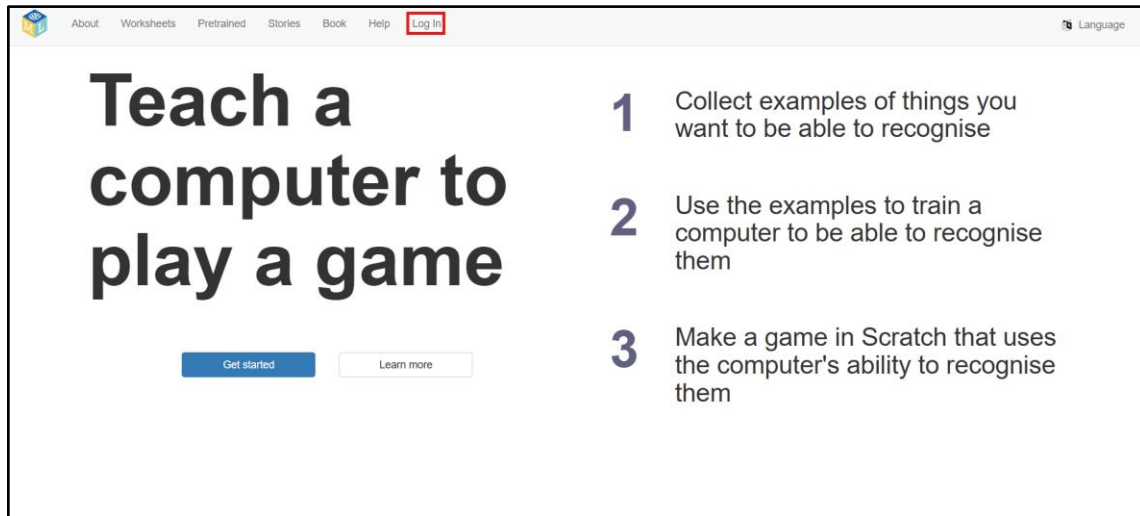
Dataset

- Initial dataset:
https://huggingface.co/datasets/Shambhavi625/heart_diseases/
- We need to convert the dataset to meet the needs of ML4kids
 - Column names must be <13 characters long
 - The file must contain up to 150 rows
 - Encode text values in numbers
- Useful data columns for our app:

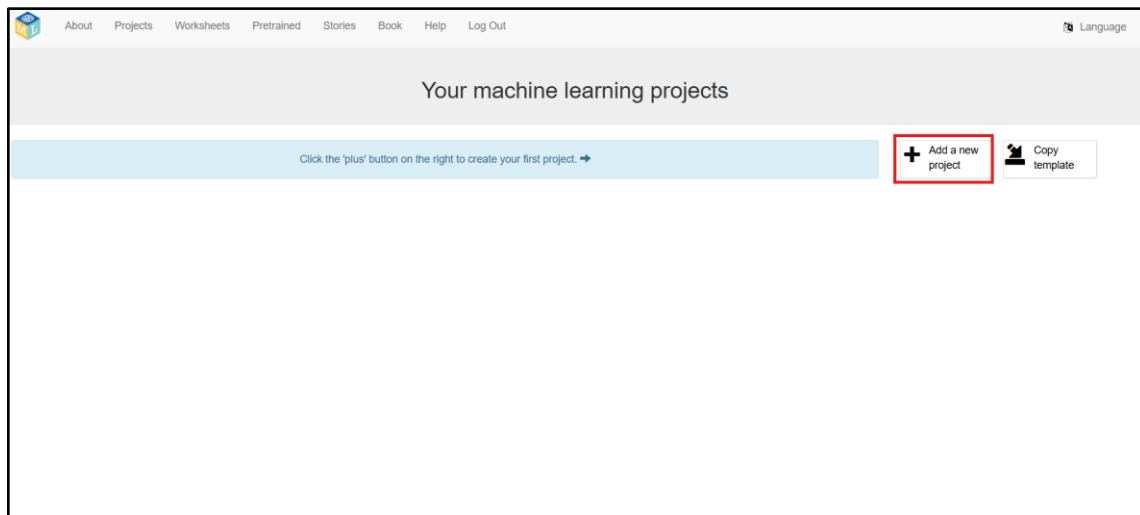
Column	Description	Possible Prices
Age	Age of the patient	Numeric
Sex	Gender of the patient	1 = Male, 0 = Female
ChestPainTyp	Type of chest pain	0 = TA (Standard Angina), 1 = ATA (Atypical Angina), 2 = NAP (Non-Angina Pain), 3 = ASY (Asymptomatic)
RestingBP	Blood pressure at rest	~120 = Normal, 130–139 = High, ≥140 = Hypertension
Cholesterol	Cholesterol level (creates plaque in the coronary arteries)	<200 = Good, 200–239 = Borderline, ≥240 = High
FastingBS	Fasting blood sugar	0 = Normal, 1 = High (diabetes indicator)
RestingECG	Electrocardiogram result at rest	0 = Normal, 1 = ST (ST-T Anomaly), 2 = LVH (Left Ventricular Hypertrophy)
MaxHR	Maximum heart rate during stress test	Numeric (Lower MaxHR → higher chance of disease)
ExerciseAngi	Chest pain during exercise	1 = Y (Yes), 0 = N (No)
Oldpeak	Lack of oxygen to the heart during exercise versus resting	0 = Normal, 1–2 = Moderate ischemia, >2 = Severe ischemia
ST_Slope	Inclination of the ST segment at the peak of the exercise	0 = Up, 1 = Flat, 2 = Down

Create, train, learn, and test

- Open ML4kids by visiting the link:
 - <https://machinelearningforkids.co.uk/>
- Log in – "Log in"



- Click "Add a new project"



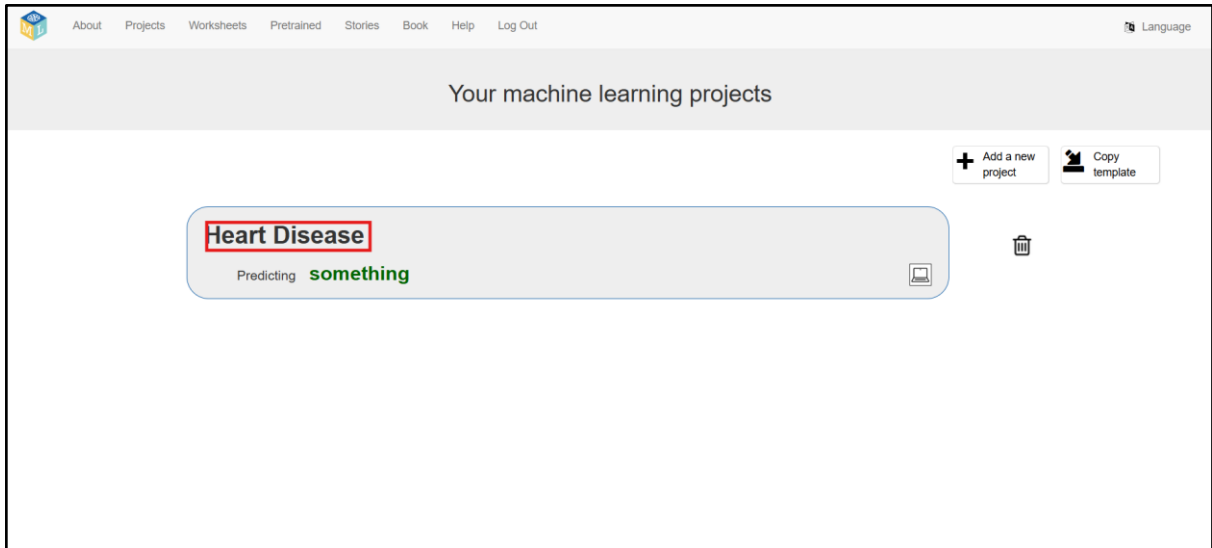
- Add "Project Name"

The screenshot shows the top navigation bar with links: About, Projects, Worksheets, Pretrained, Stories, Book, Help, Log Out, and a Language icon. The main heading is "Start a new machine learning project". Below it, the "Project Name" field is highlighted with a red box and contains the text "Heart Disease". To the right of this field is a grey box with the text "Give your project a name to describe what you'll be teaching the computer." Below the "Project Name" field are two dropdown menus: "Project Type" and "Storage". At the bottom right, there are two buttons: "CREATE" and "CANCEL".

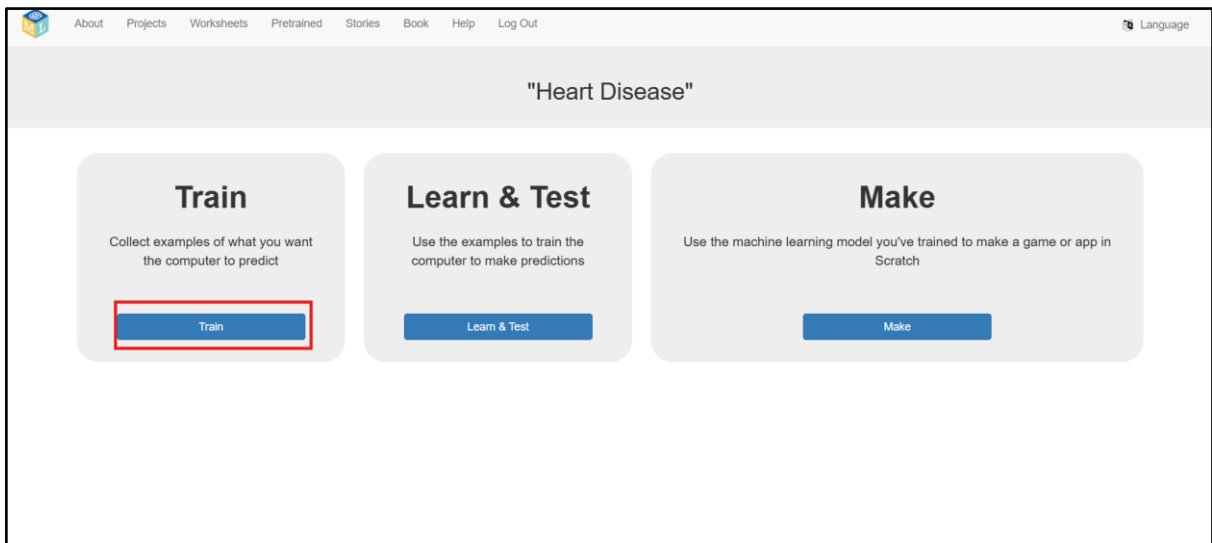
- As "Project Type" select:
 - "predicting numbers"
- In the "Storage" field, select:
 - "In your web browser"
- Click "CREATE"

This screenshot shows the same form as the previous one, but with the "Project Type" dropdown menu selected to "predicting numbers" and the "Storage" dropdown menu selected to "In your web browser". The "Project Name" field now has a light blue background. A grey box to the right of the "Storage" dropdown contains the text: "Where do you want to store this project? Storing in your web browser removes limits on how big your project can be. Storing in the cloud will let you access the project from any computer. (See 'What difference does it make where a project is stored?')". The "CREATE" button is now highlighted with a red box.

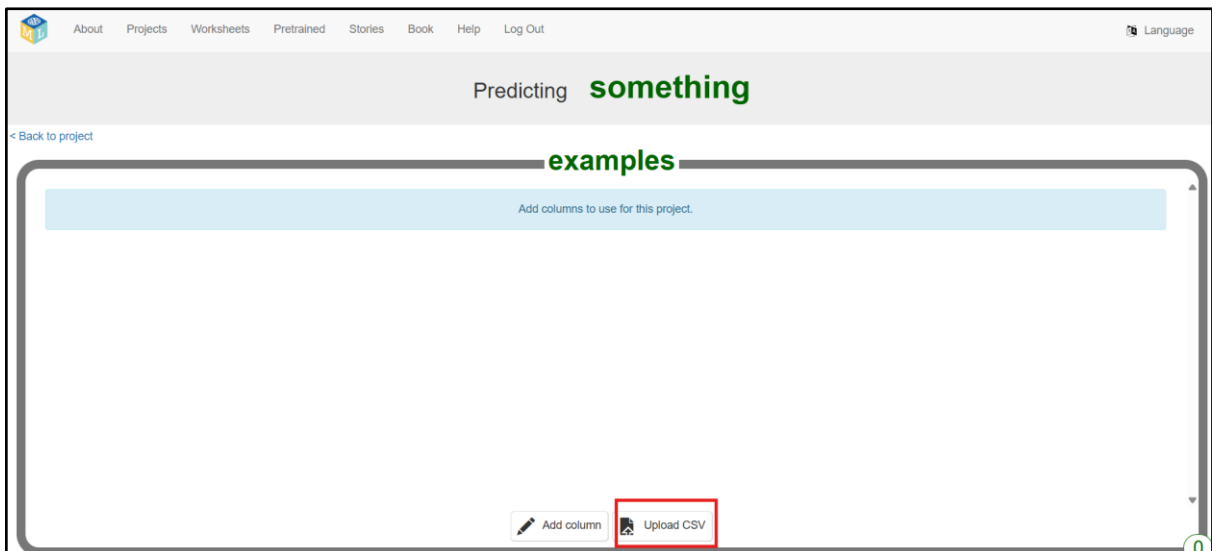
- Click on the name of your project



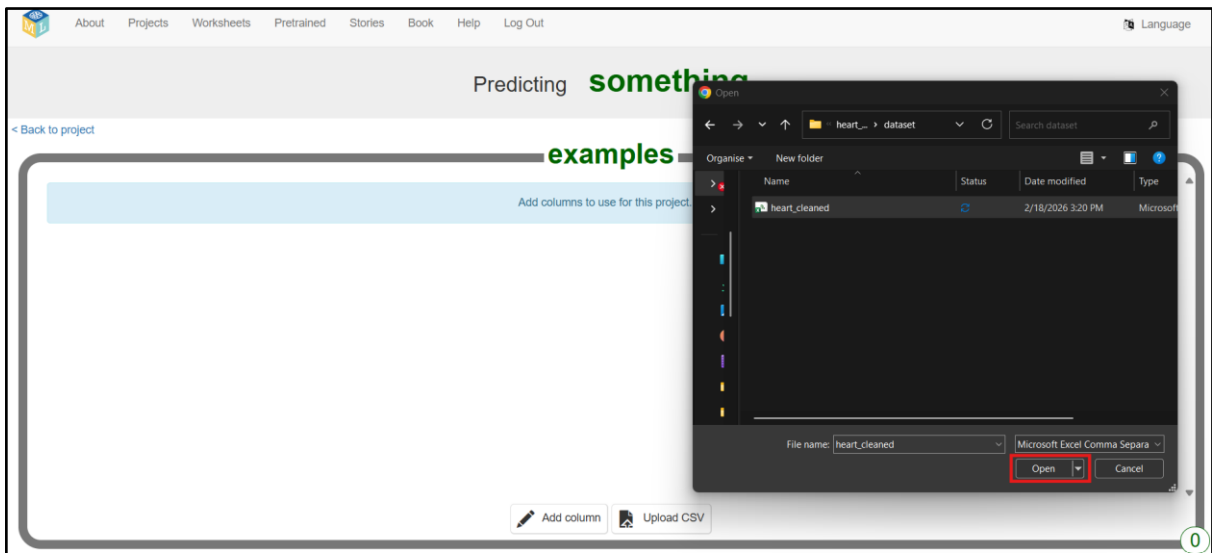
- Click "Train"



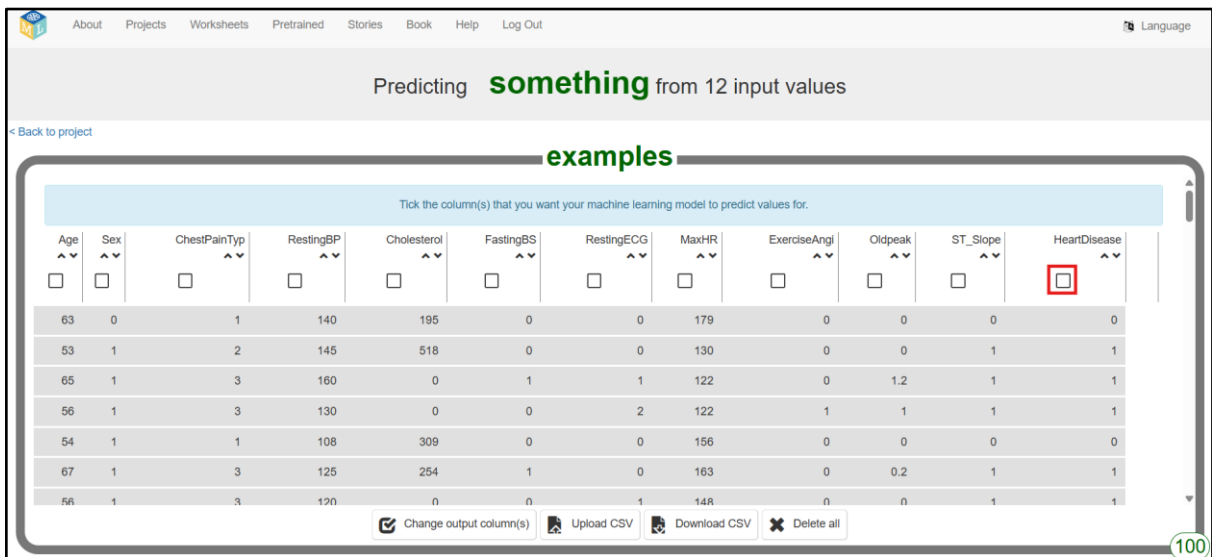
- Click on "upload CSV"



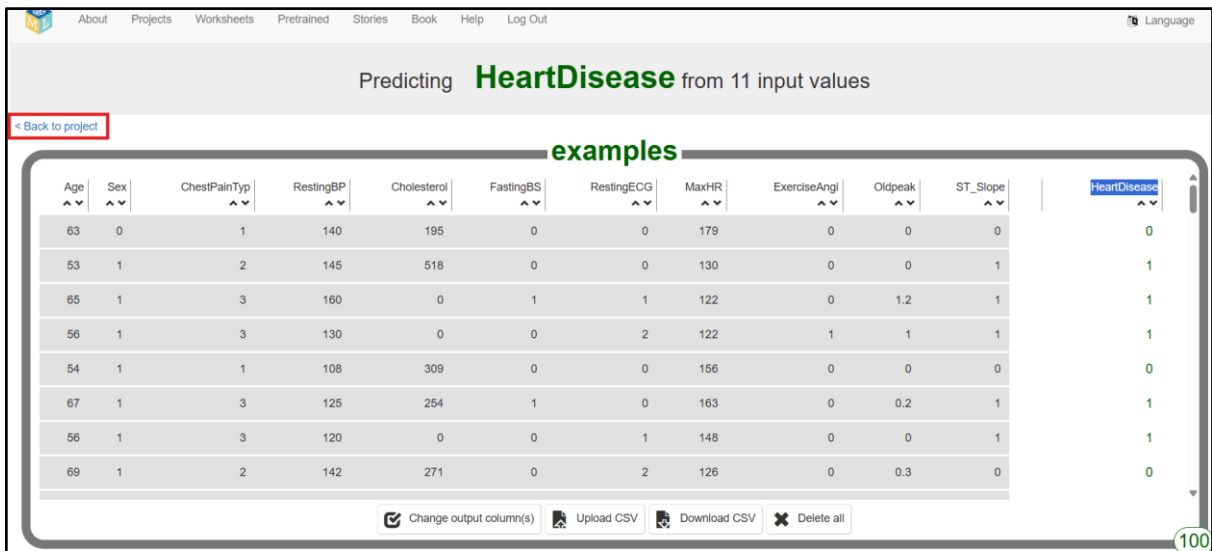
- Select the file placed here: [Training Dataset](#)
- Click "Open"



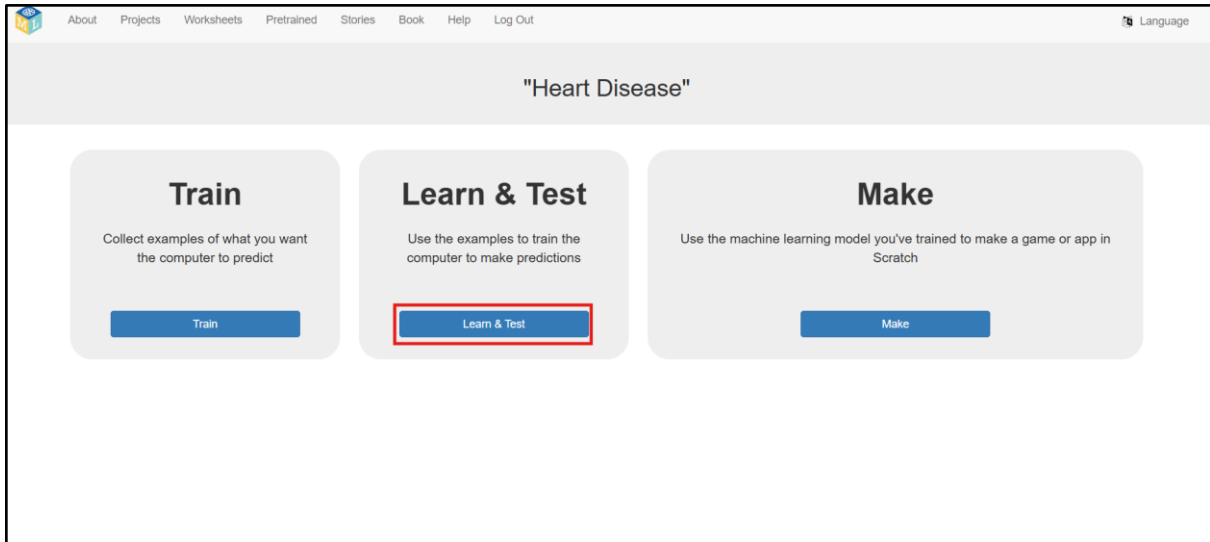
- Select "HeartDisease" as the output column



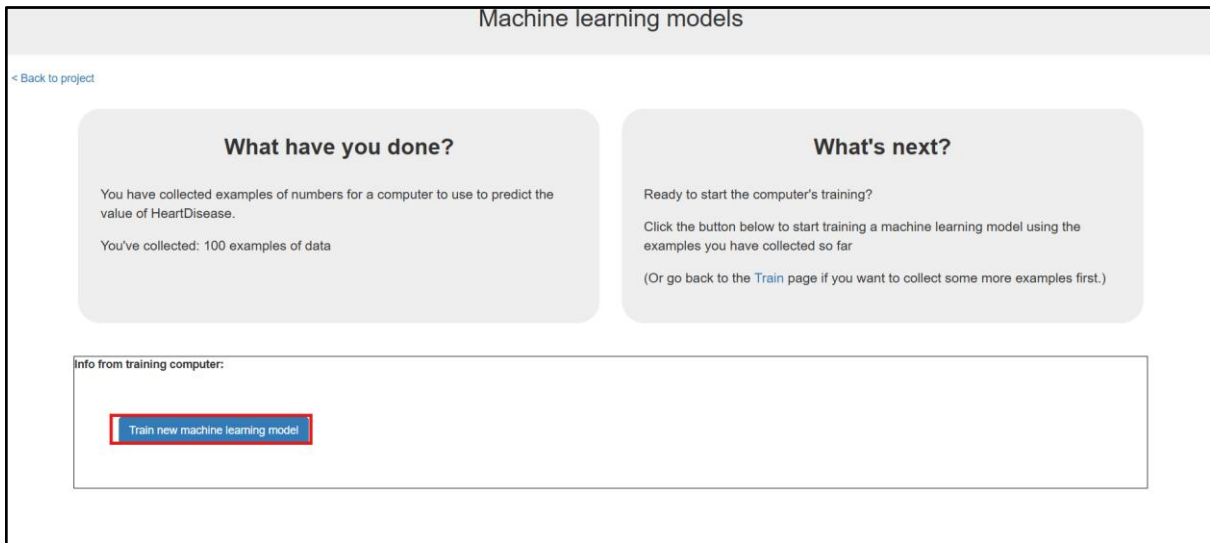
- Click on "Back to project"



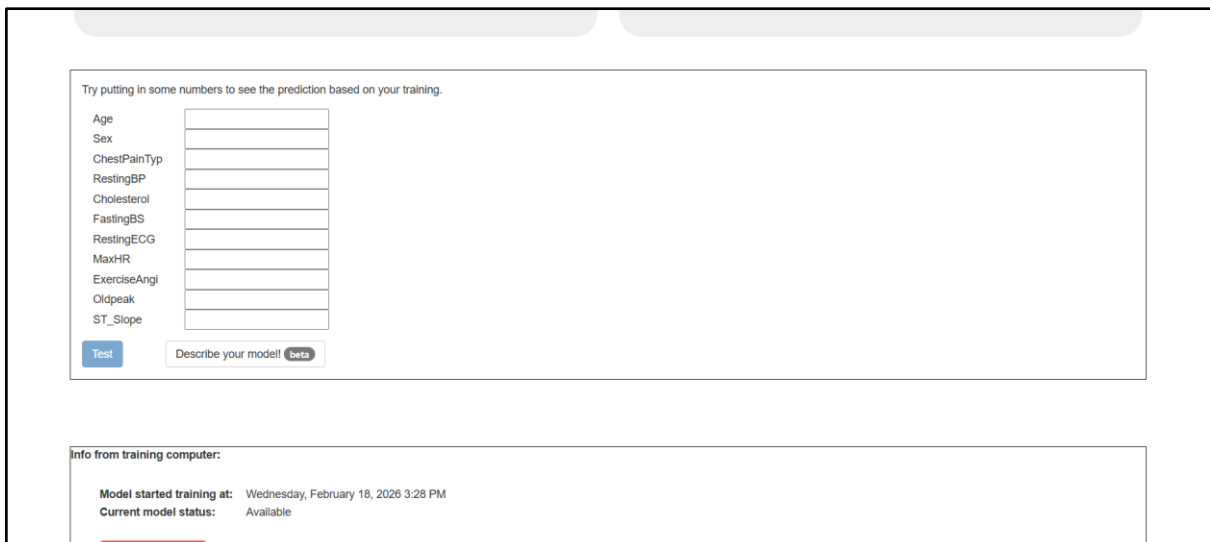
- Click on "Learn & Test"



- Click on "Train new machine learning model"



- If your model was successfully trained, it is available to try it out



- Add a few values to the empty fields from the [Test dataset](#) file and click "Test". The "Prediction" field will display the model's prediction of a person's probability of cardiovascular disease with the characteristics you provided

Try putting in some numbers to see the prediction based on your training.

Age	30
Sex	0
ChestPainTyp	0
RestingBP	0
Cholesterol	200
FastingBS	0
RestingECG	0
MaxHR	140
ExerciseAngi	0
Oldpeak	0
ST_Slope	0

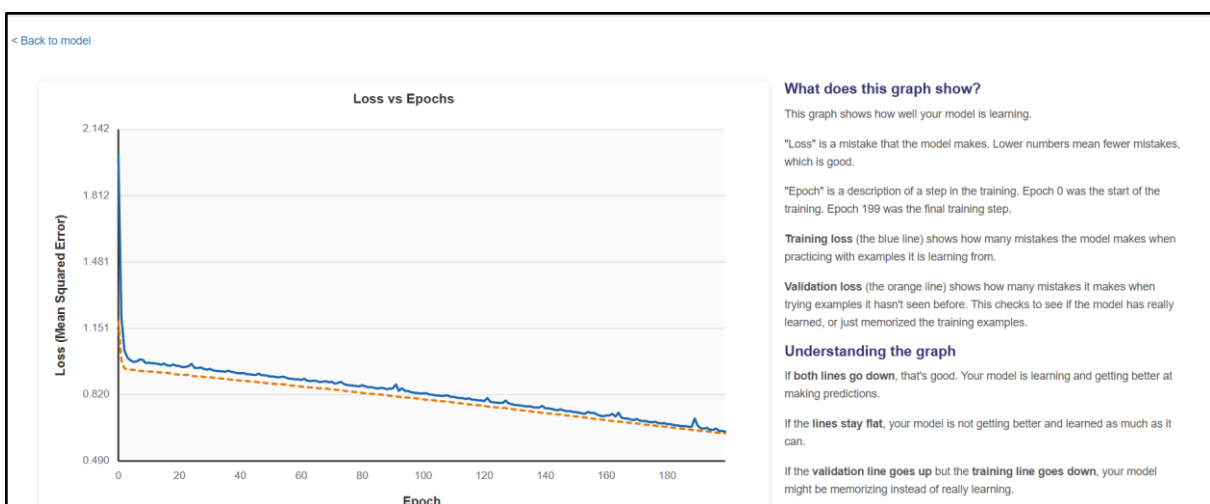
Prediction:
HeartDisease

Info from training computer:

- If you click on "Describe your model!" you can see the loss function

Try putting in some numbers to see the prediction based on your training.

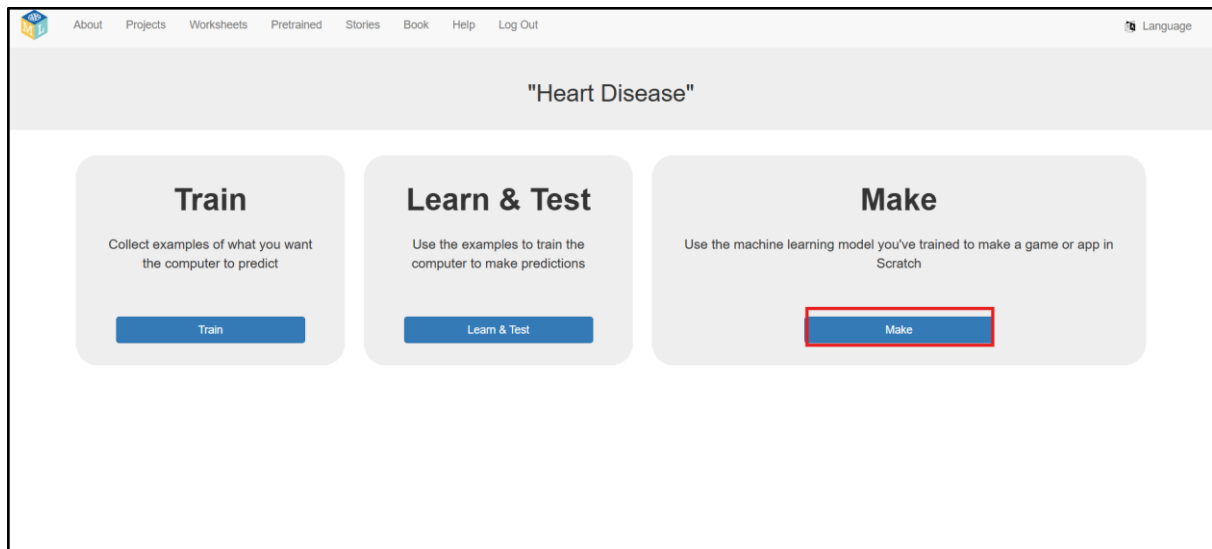
Age	
Sex	
ChestPainTyp	
RestingBP	
Cholesterol	
FastingBS	
RestingECG	
MaxHR	
ExerciseAngi	
Oldpeak	
ST_Slope	



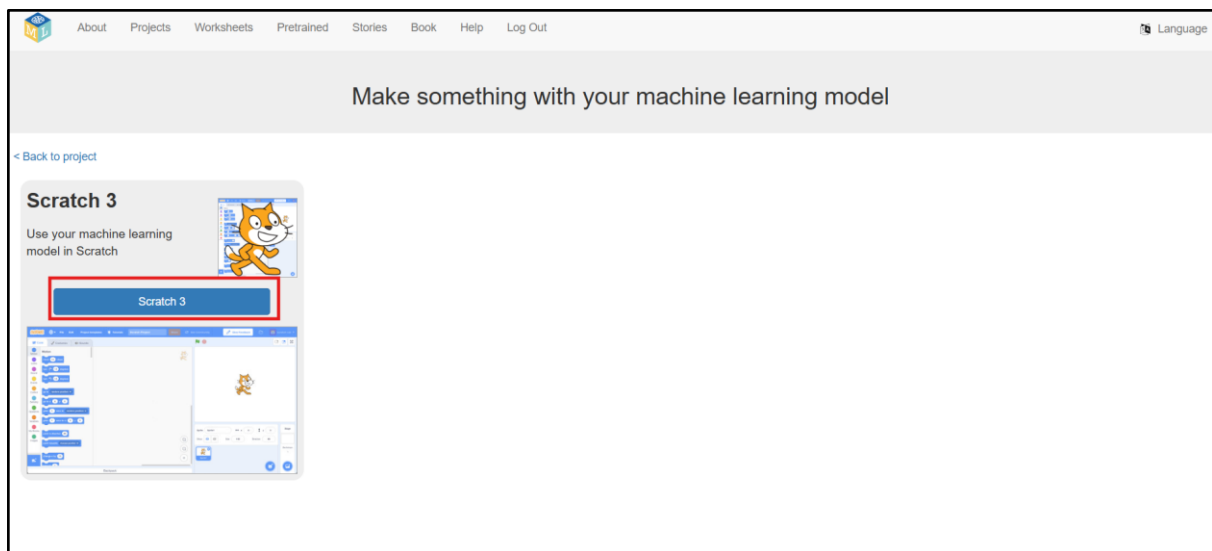
- Click on "Back to model"
- Click on "Back to project"

Implementation

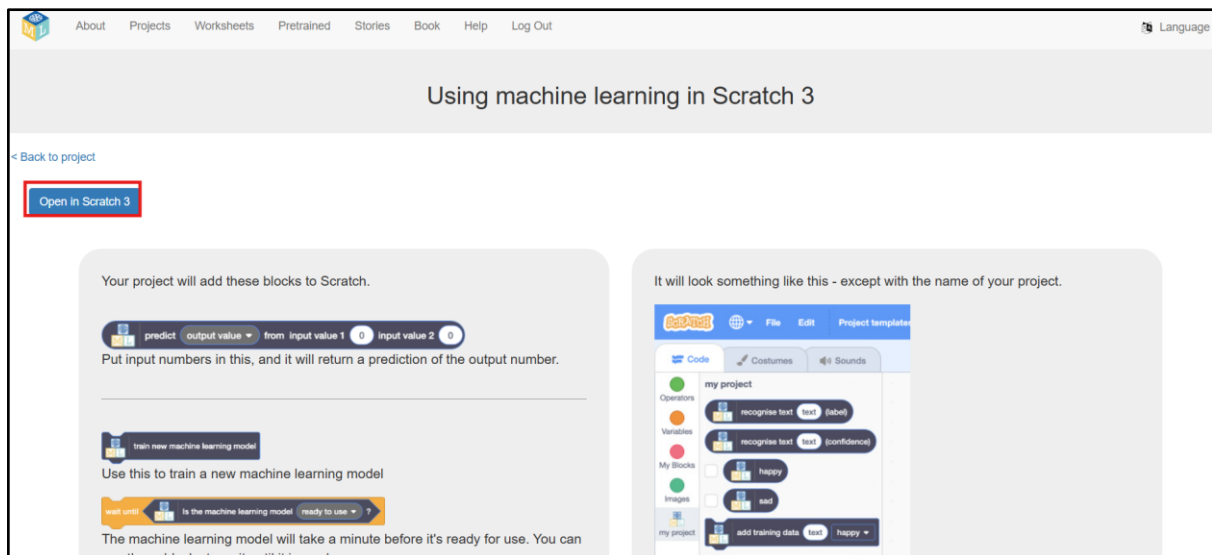
- Click "Make"



- Click on "Scratch 3"



- Click on "Open in Scratch 3"



- We want to create a block of code that when our model predicts a number above 0.5 it means that the person has heart disease or is at high risk, otherwise the person is healthy
- Find the commands according to their colors and regenerate the code block you see below:

