Weather Recognition

Objective

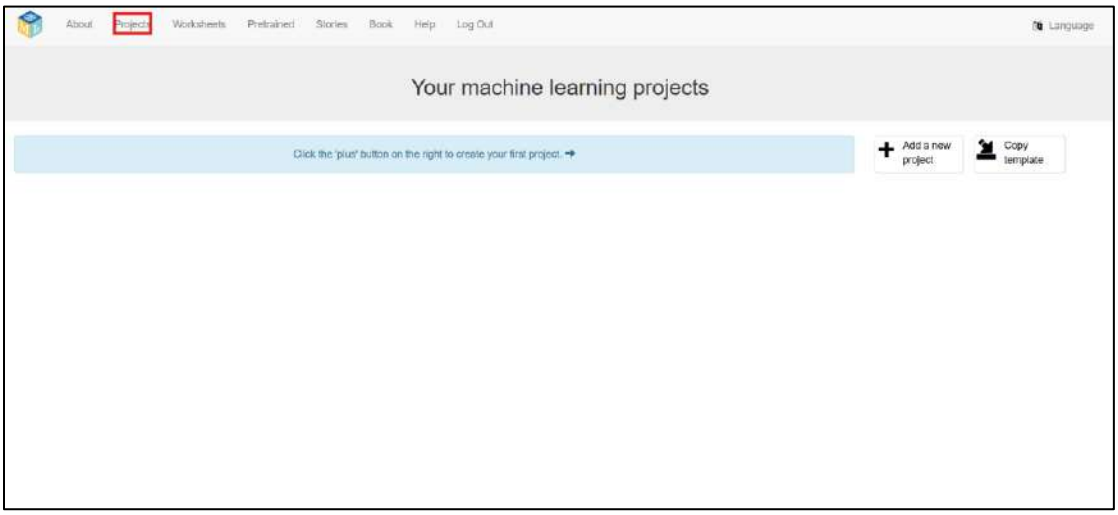
Our goal is to give our model images that include weather phenomena and recognize them

Dataset

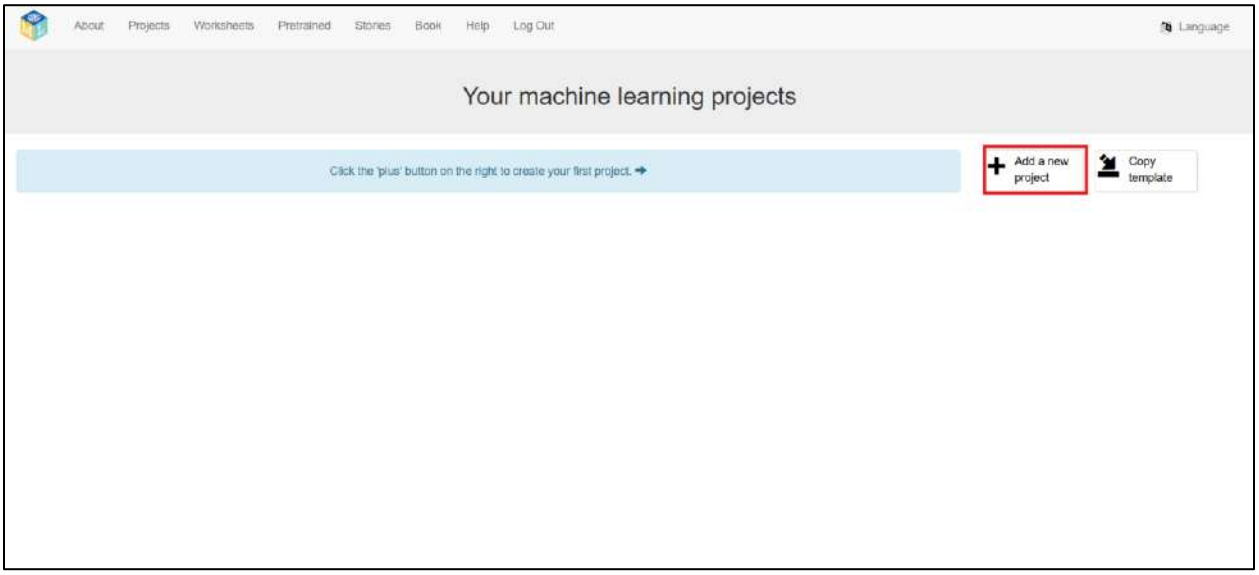
- The full dataset can be found here: https://www.kaggle.com/datasets/jehanbhathena/weather-dataset
- There are 11 categories of weather phenomena
- For each category there is a folder containing the corresponding images
- To meet the ML4Kids requirements we will reduce the dataset as follows:
    - Removal of certain categories
    - Remove a few images from each category
- The categories we choose are:
    - **Snow**
    - **Sandstrom**
    - **Rainbow**
    - **Rain**
    - **Lightning**
    - **Frost**
    - **Fogsmog**
- You can find the reduced dataset here: **Training Dataset**
- This is the dataset that will be used in the next steps

Create, train, learn, and test

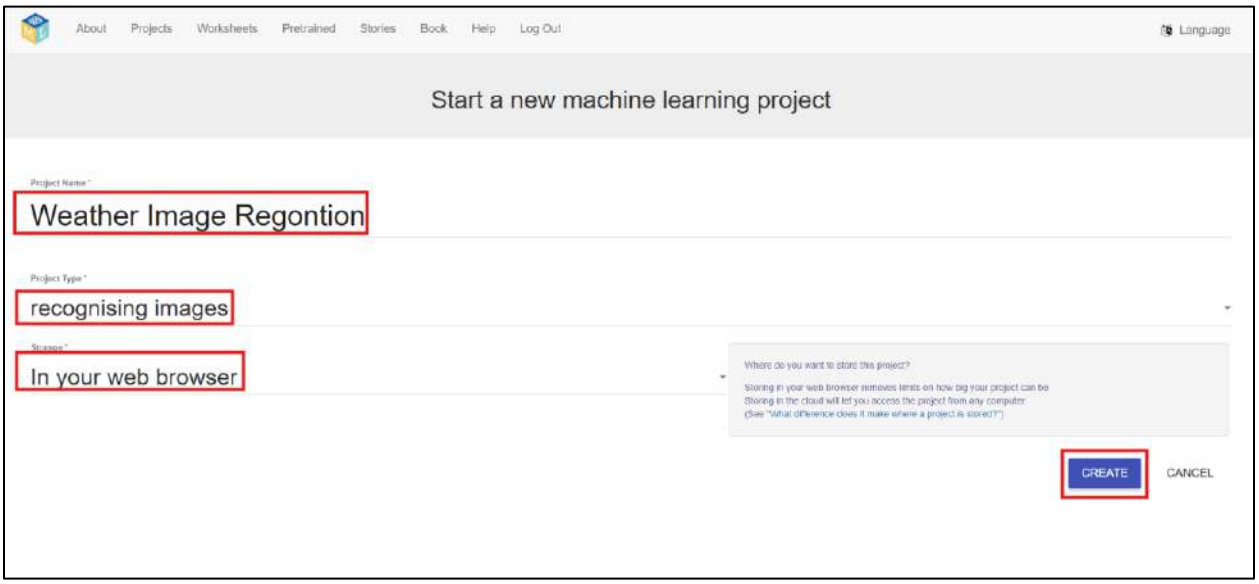
- Login to ML4Kids: https://machinelearningforkids.co.uk/
- Go to the "**Projects**" tab



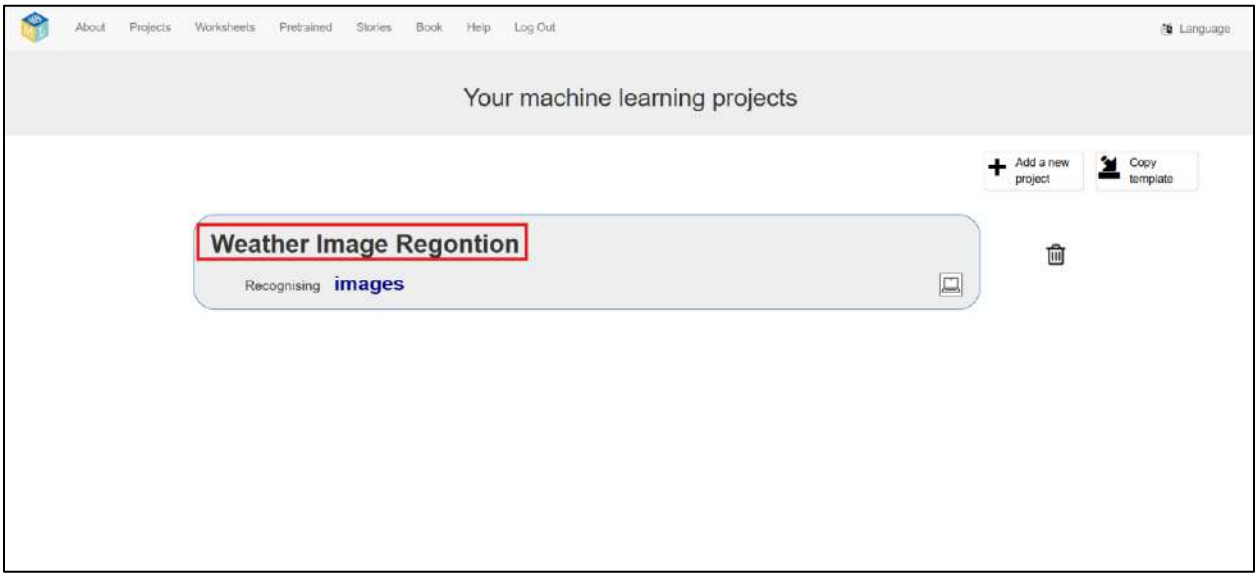
- Click "**Add a new project**"



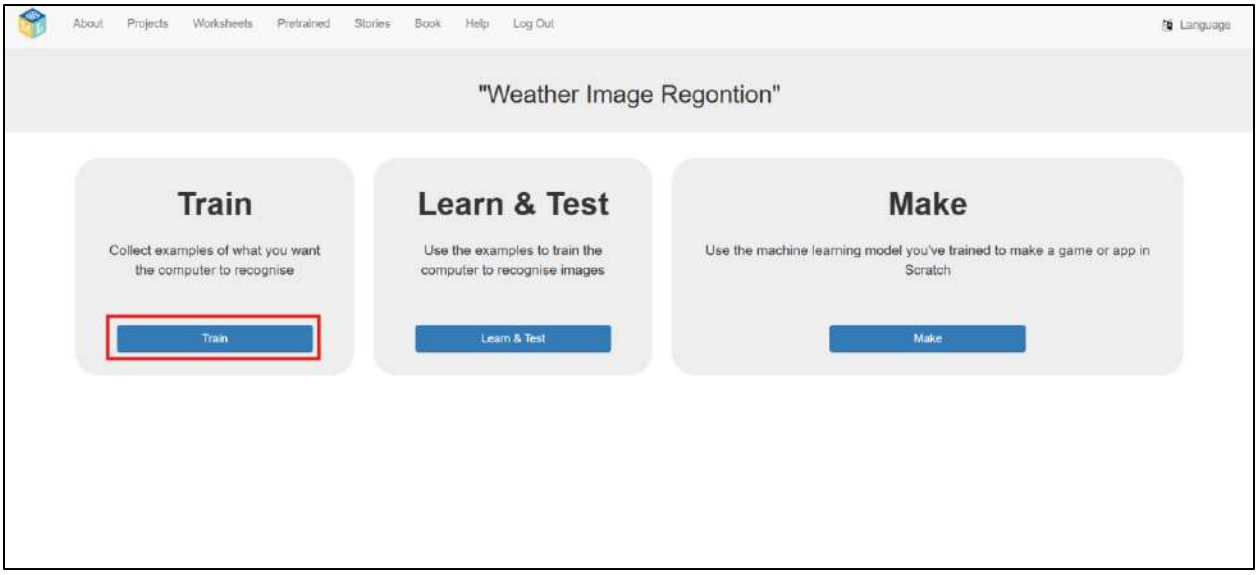
- Type in a "**Project Name**"
- As "**Project Type**" select "**recognizing images**"
- Select Storage: "**In your web browser**"
- Click "**CREATE**"



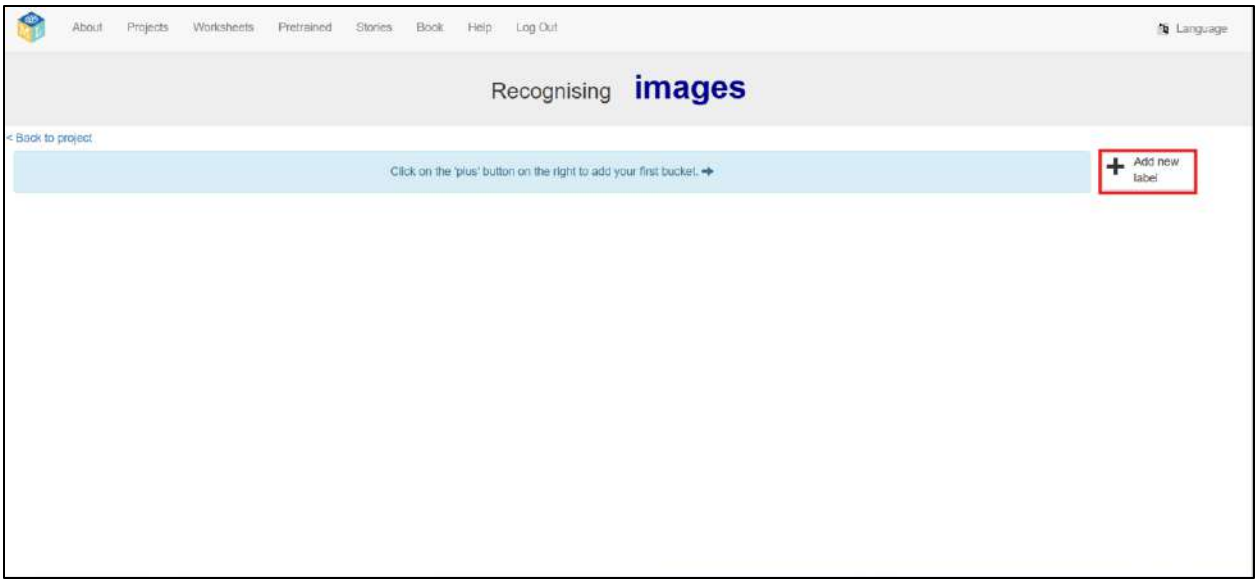
- Click on the title of the project



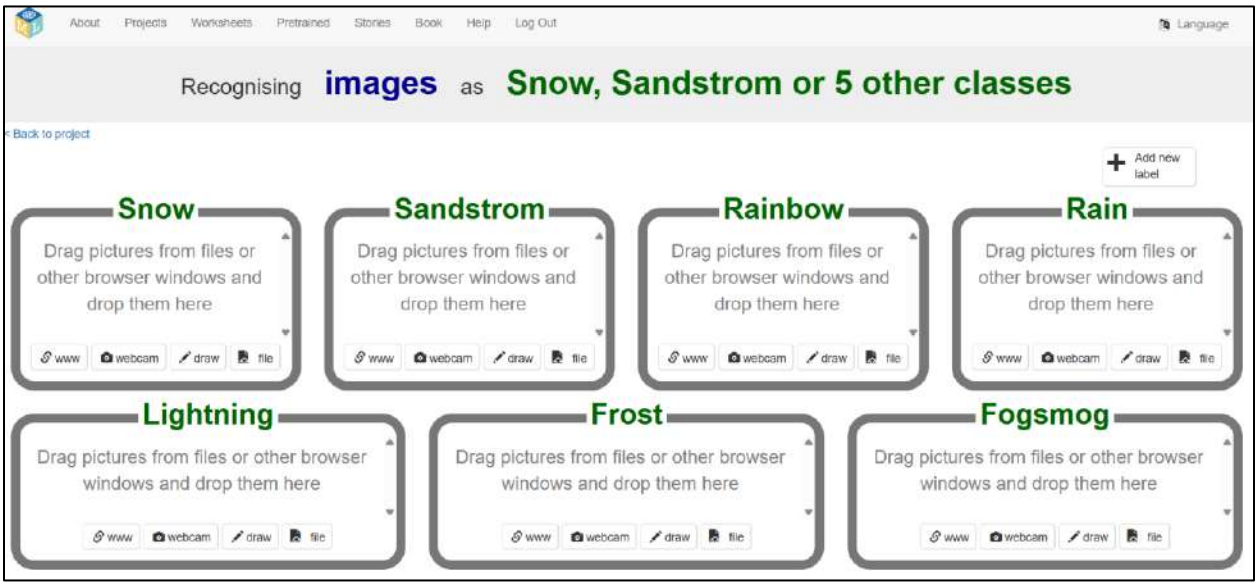
- Click "**Train**"



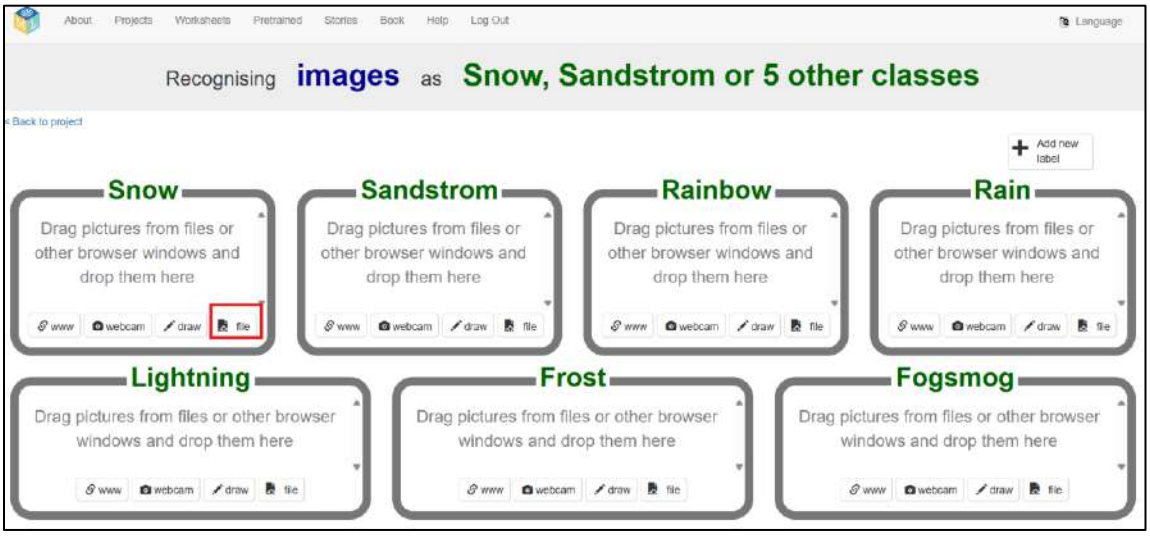
- Click on "**Add new label**"



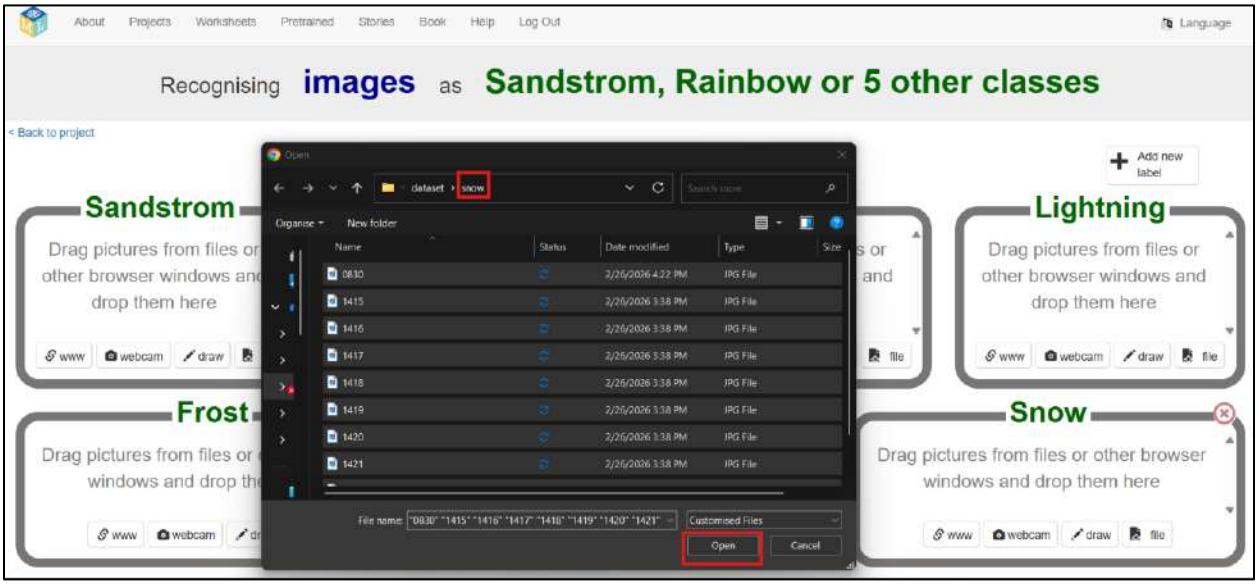
- Create 7 labels one for each weather category:
    1. **Snow**
    2. **Sandstorm**
    3. **Rainbow**
    4. **Rain**
    5. **Lighting**
    6. **Frost**
    7. **Fogsmog**
- After this step, your screen should look like the following:



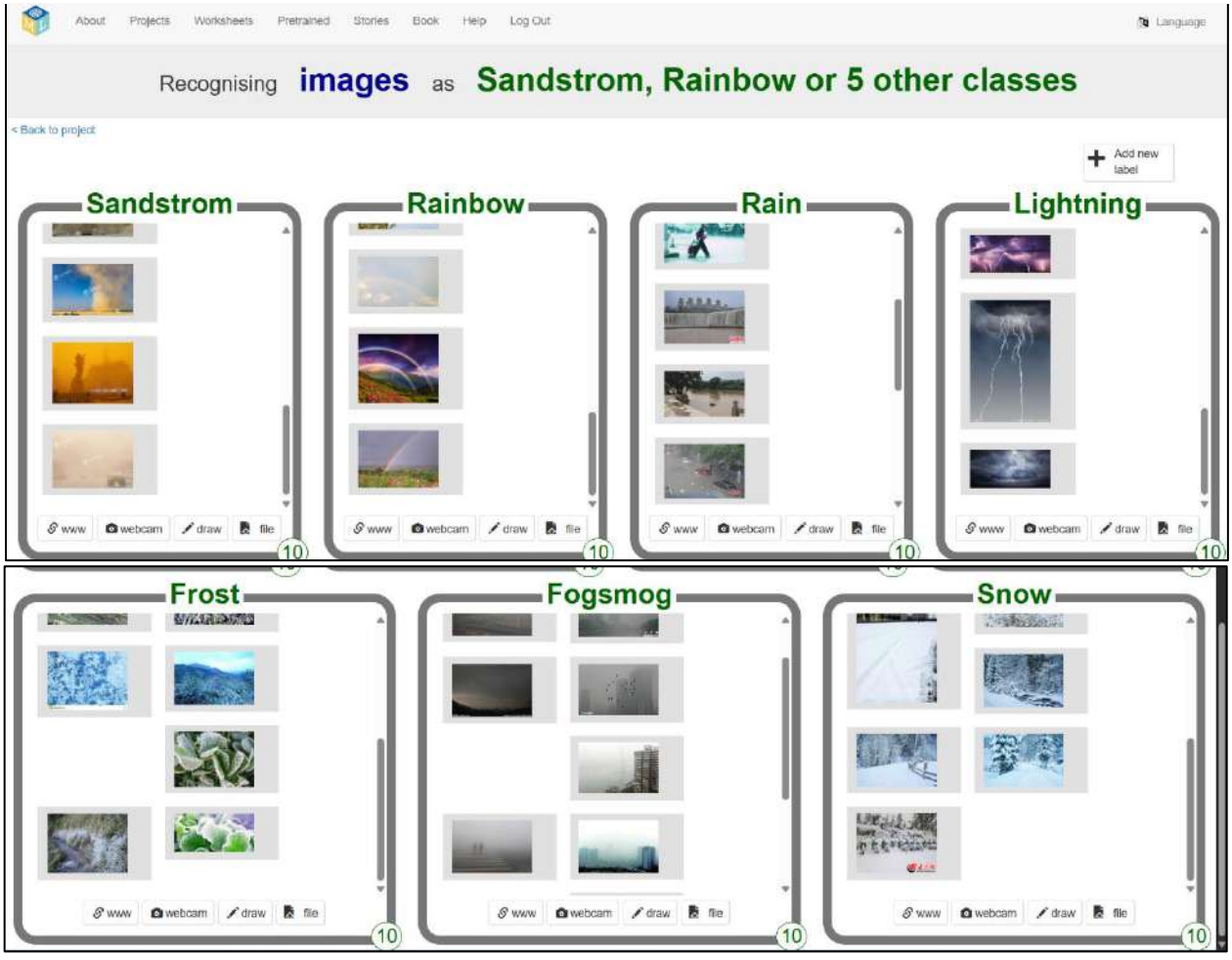
- For each tag click on "**file**"



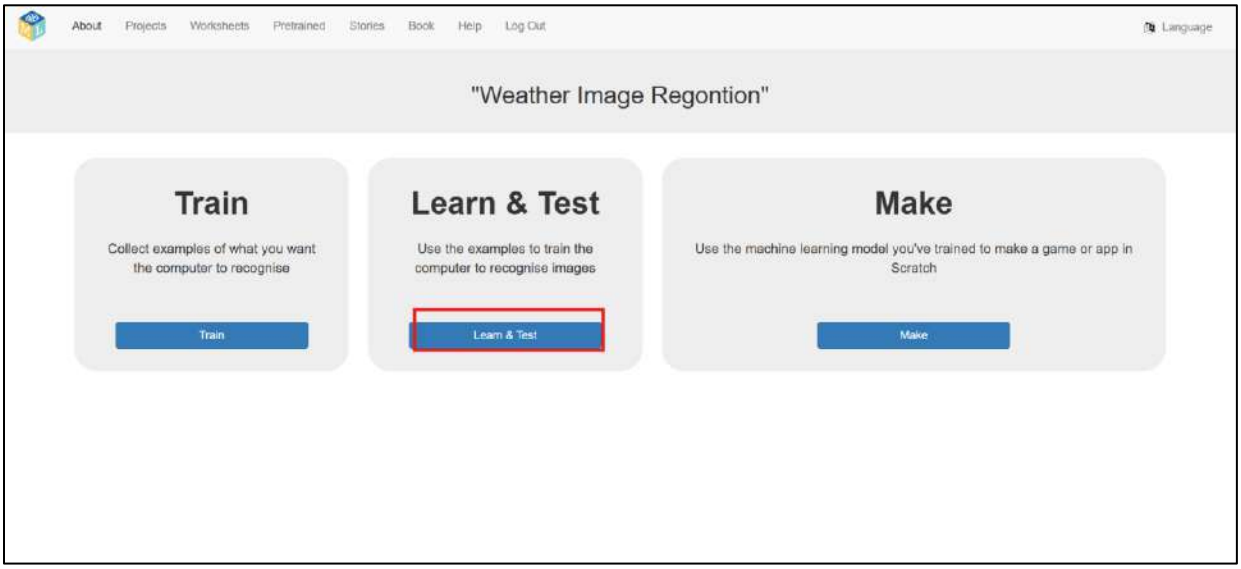
- Go to the appropriate folder. Select all files in the folder
- Click "**Open**" or you can drag and drop the files in the folder



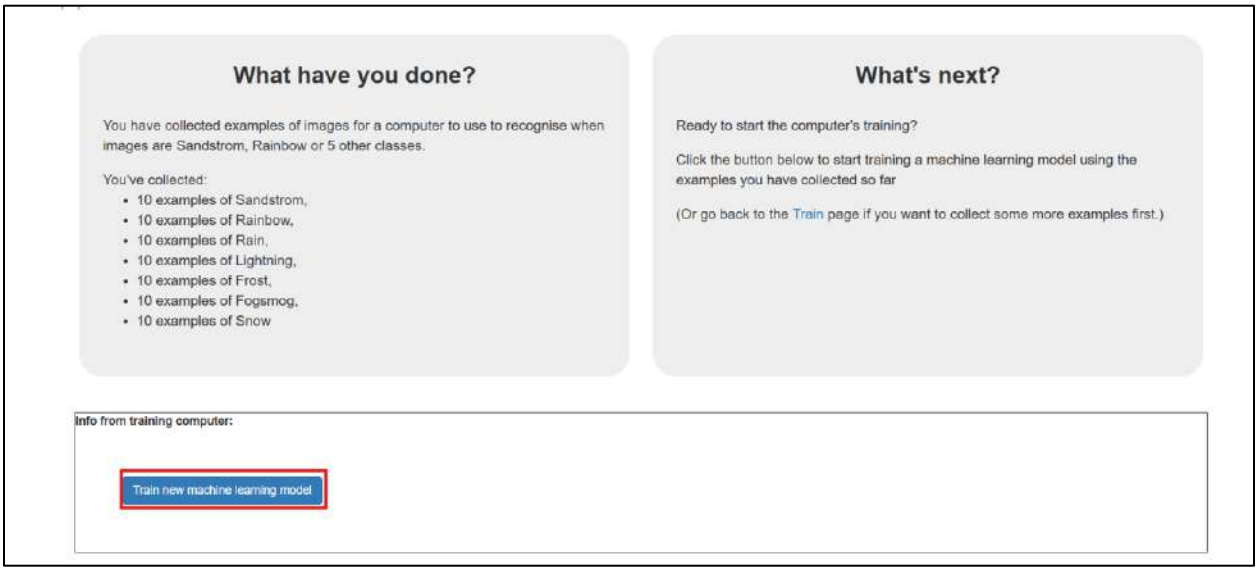
- For each tag there are 10 images/files
- In the end, your screen should look like the one below:



- Click on "**Back to project**"
- Click on "**Learn & Test**"

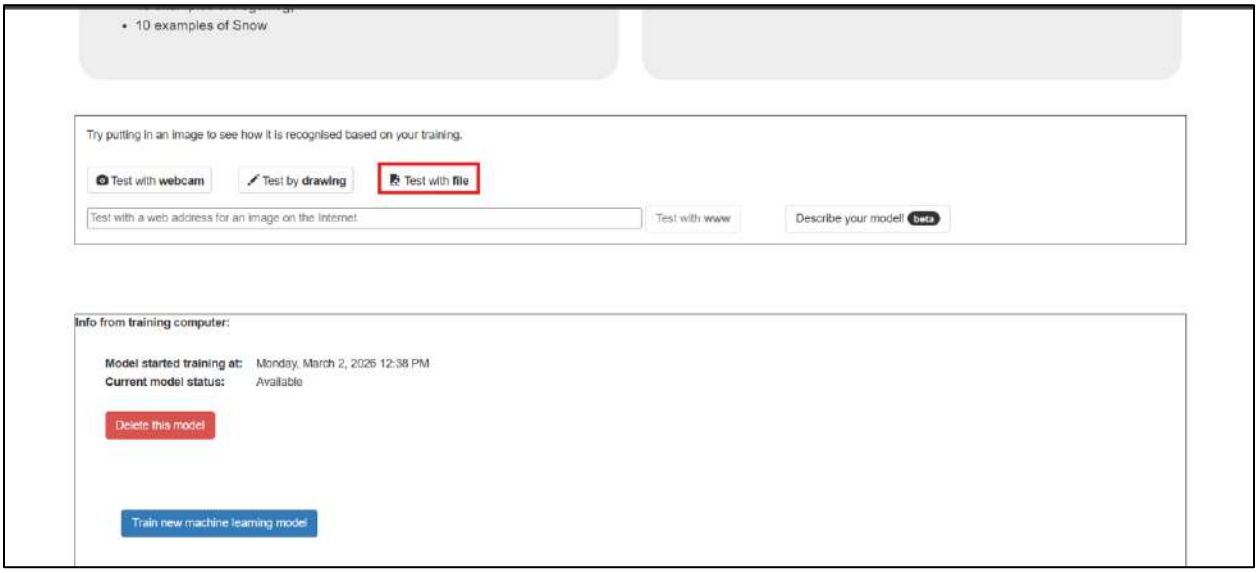


- Scroll down and click on "**Train new machine learning model**"

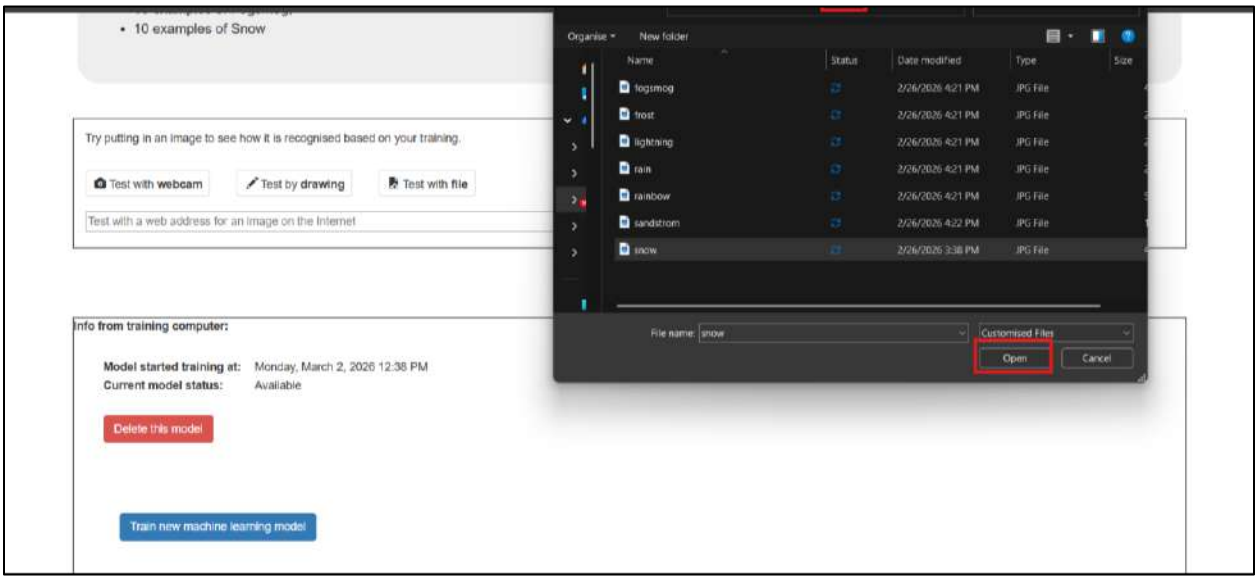


- After a few seconds your screen should look like this

- You can test your model by selecting an image from the folder: **Test dataset**. This file contains new data that have not been used in the training phase, but for which the category to which they belong is known. This file is used to see the accuracy of our model.
- Click on "**Test with file**"

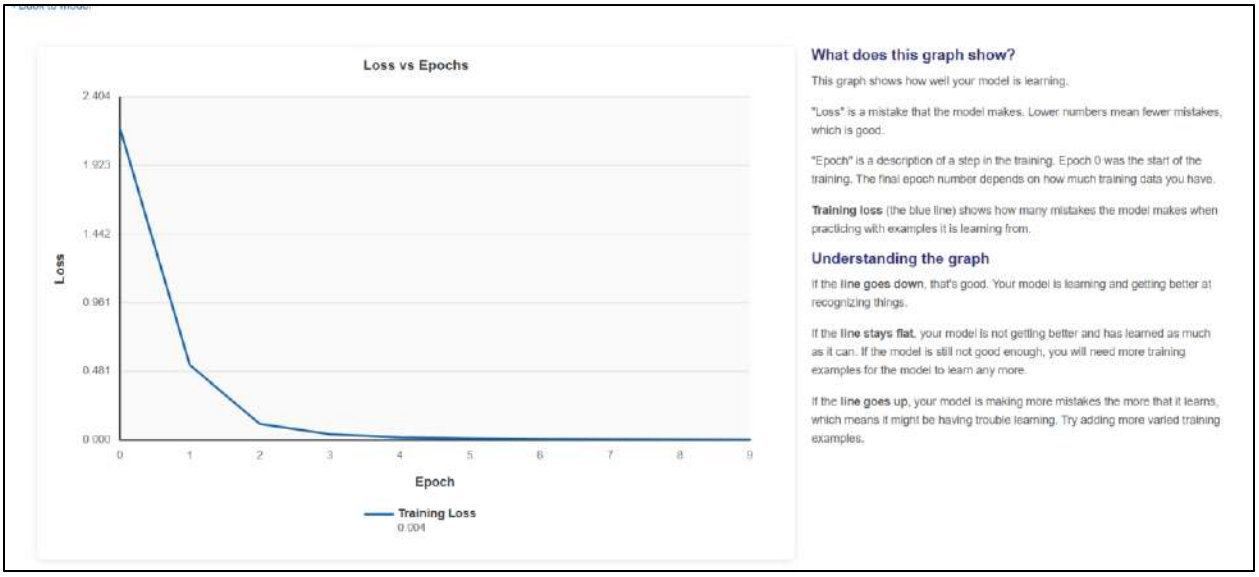


- Select an image and click "**Open**"

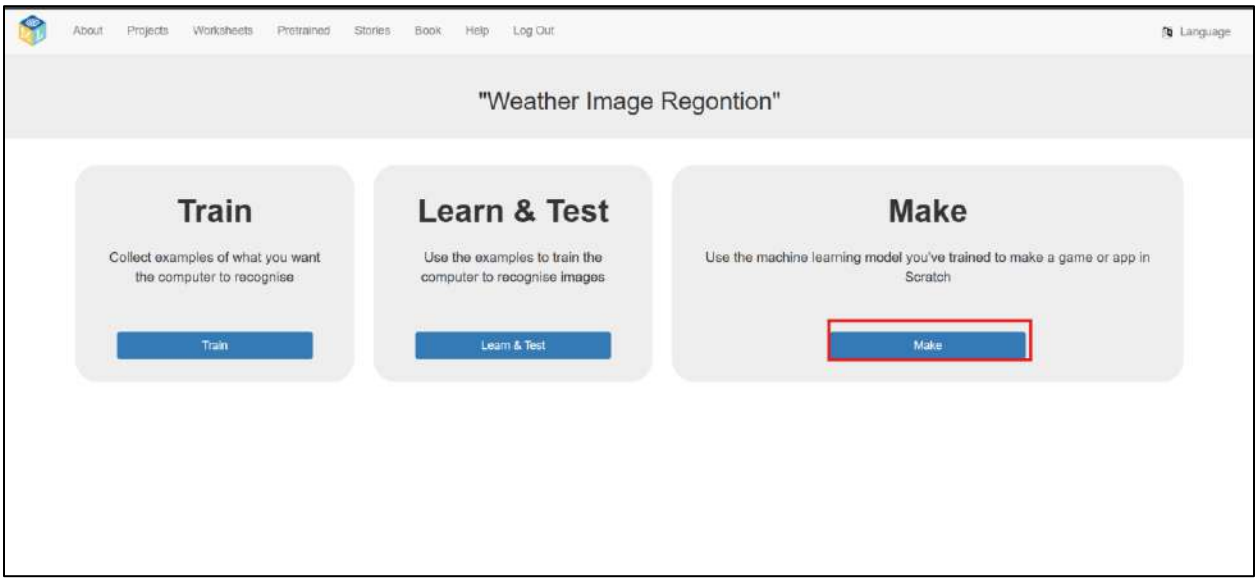


- We chose snow.png image and as we can see below, our model recognizes the image as "**Snow**" (correctly) with a 91% confidence score

- You can also view the loss mode by clicking on "**Describe your model!**"

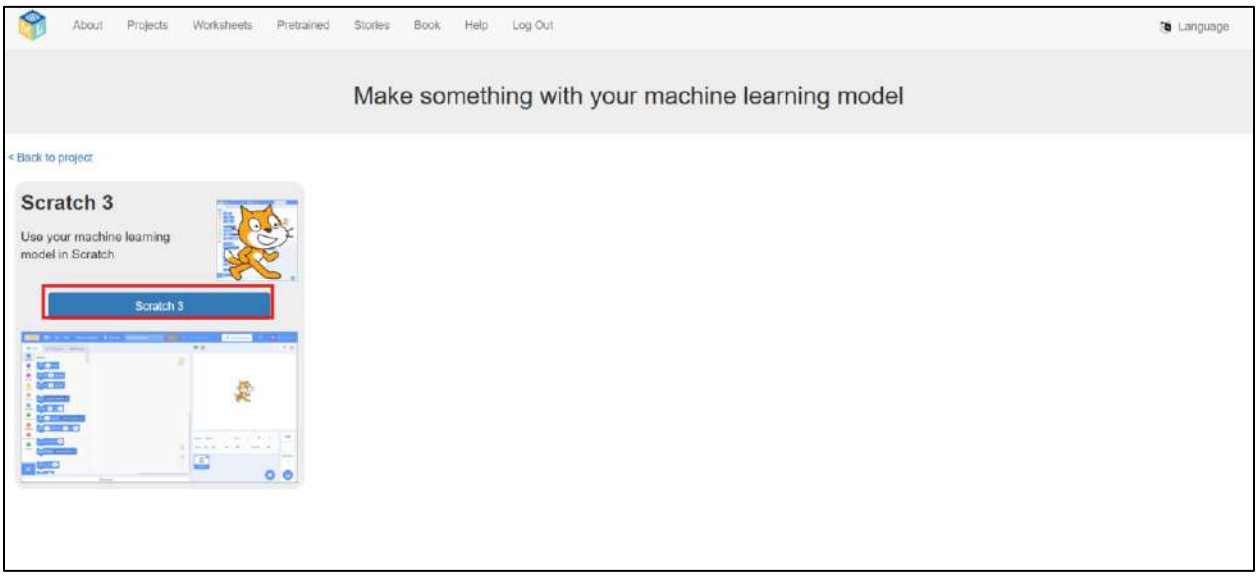


- Click "**Back to model**" (top left)
- Click on "**Back to project**" (top left)
- Click "**Make**"

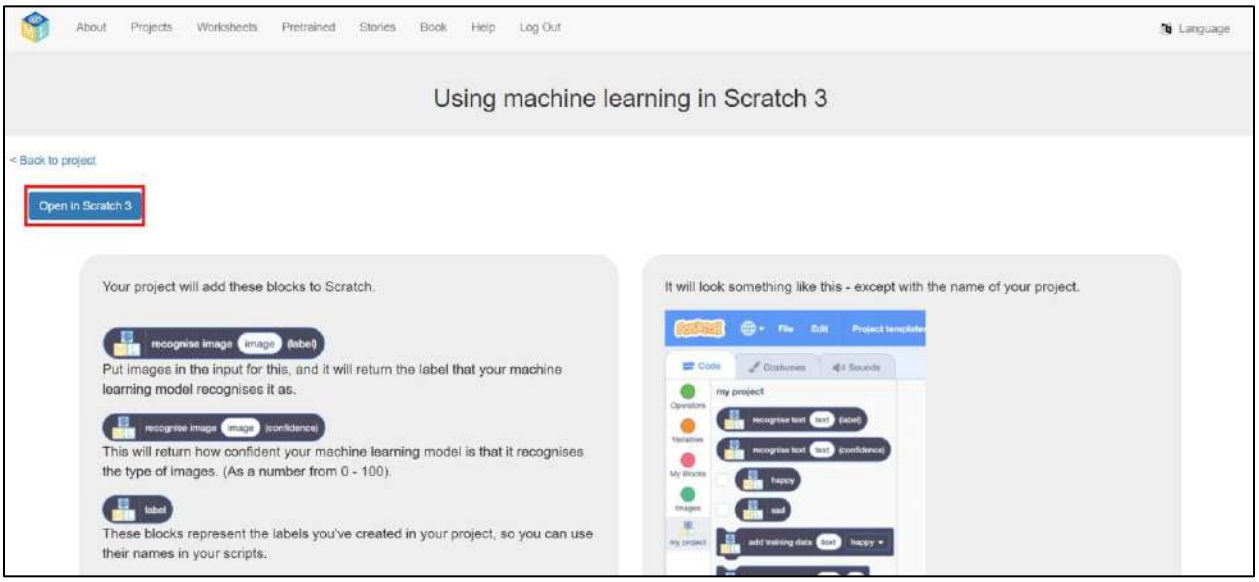


Implementation

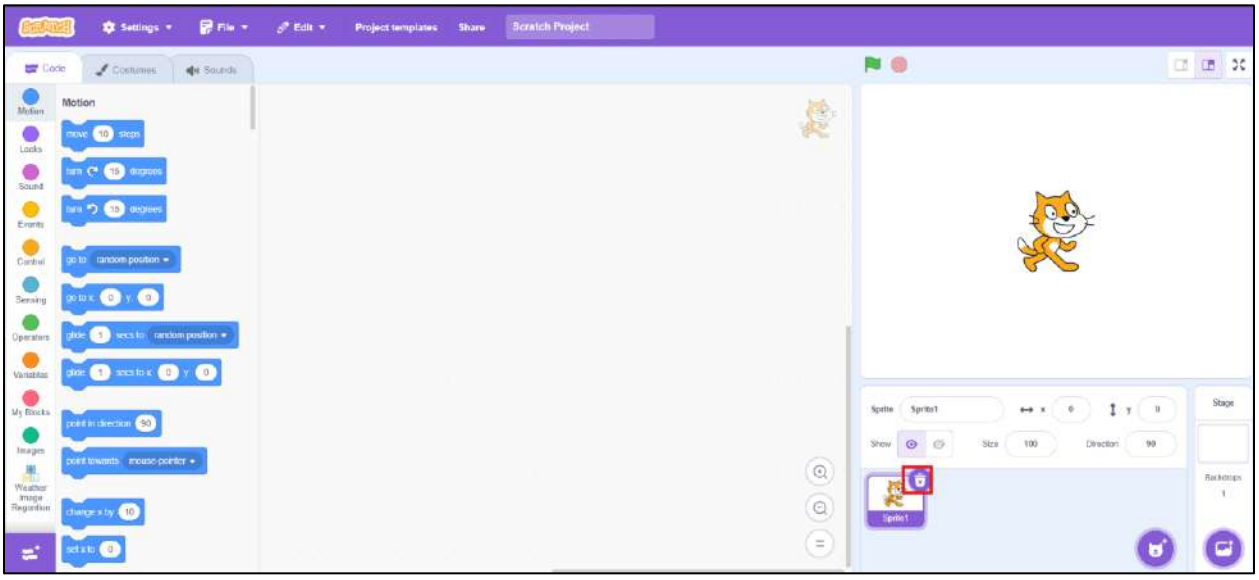
- Click on "**Scratch 3**"



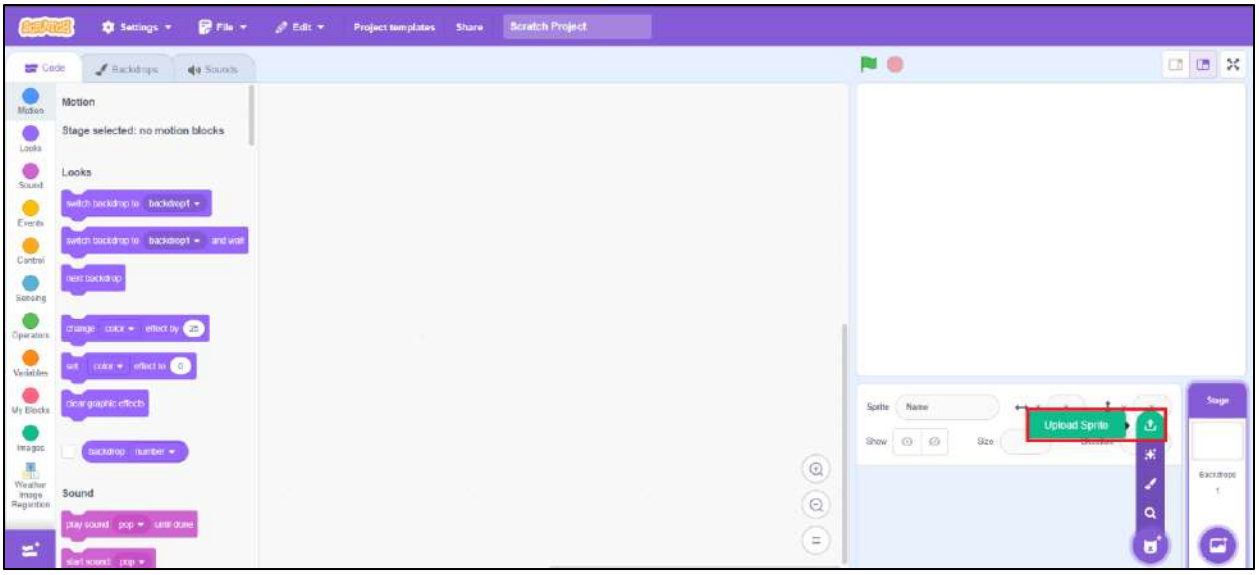
- Click on "**Open in Scratch 3**"



- We will create an app where we will upload an image and the model prediction will be displayed after the green flag is clicked
- Remove "**Sprite 1**"

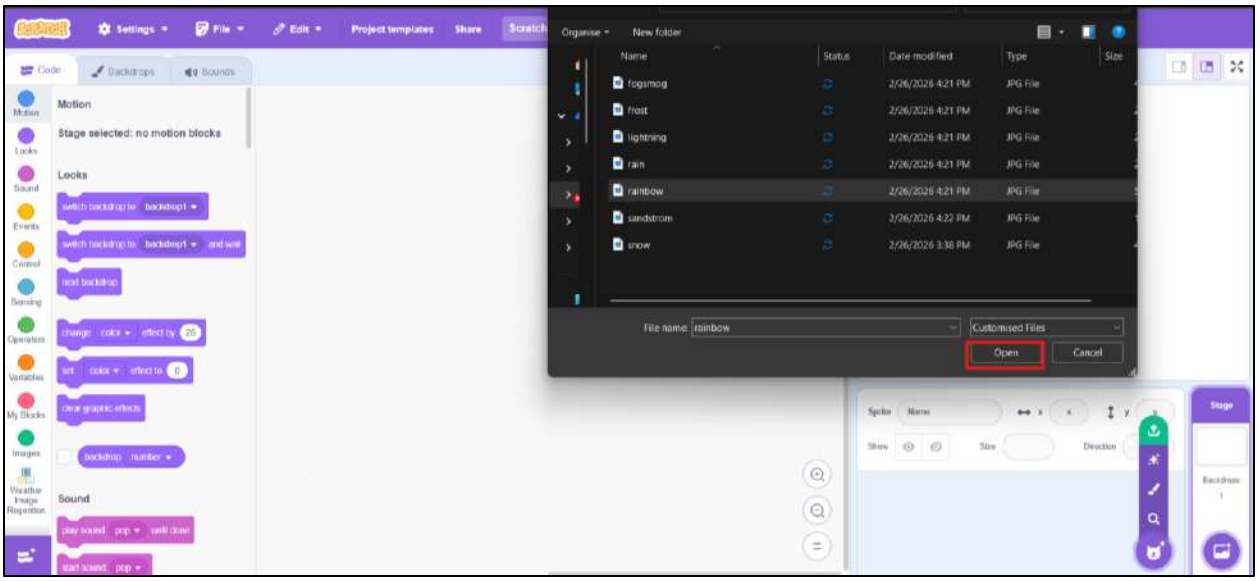


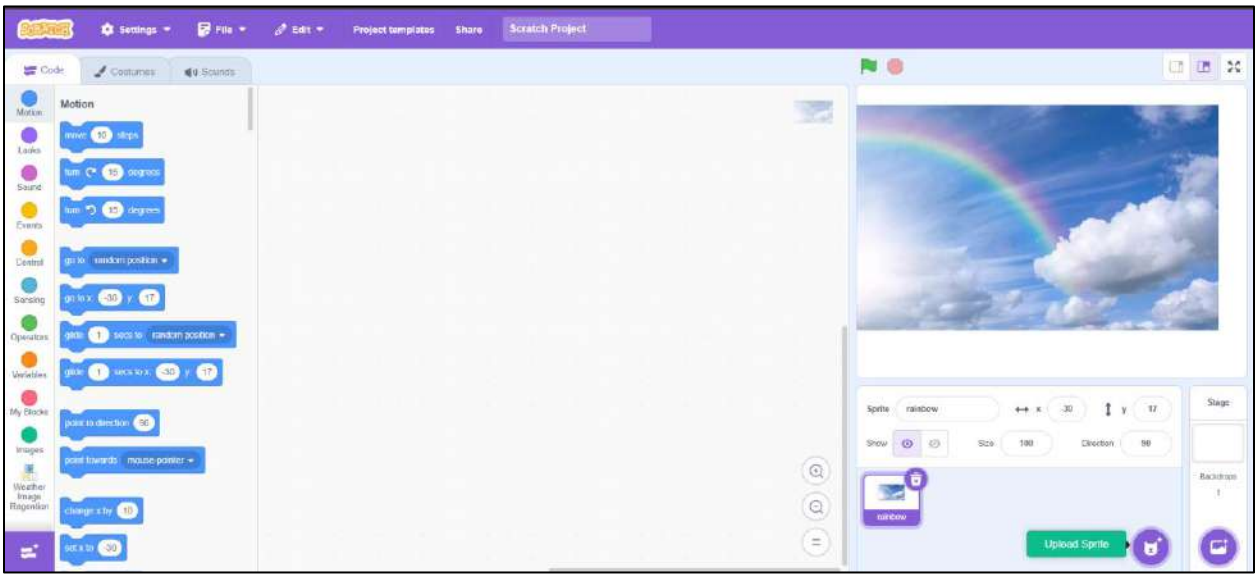
- Hover over the cat icon (bottom right)



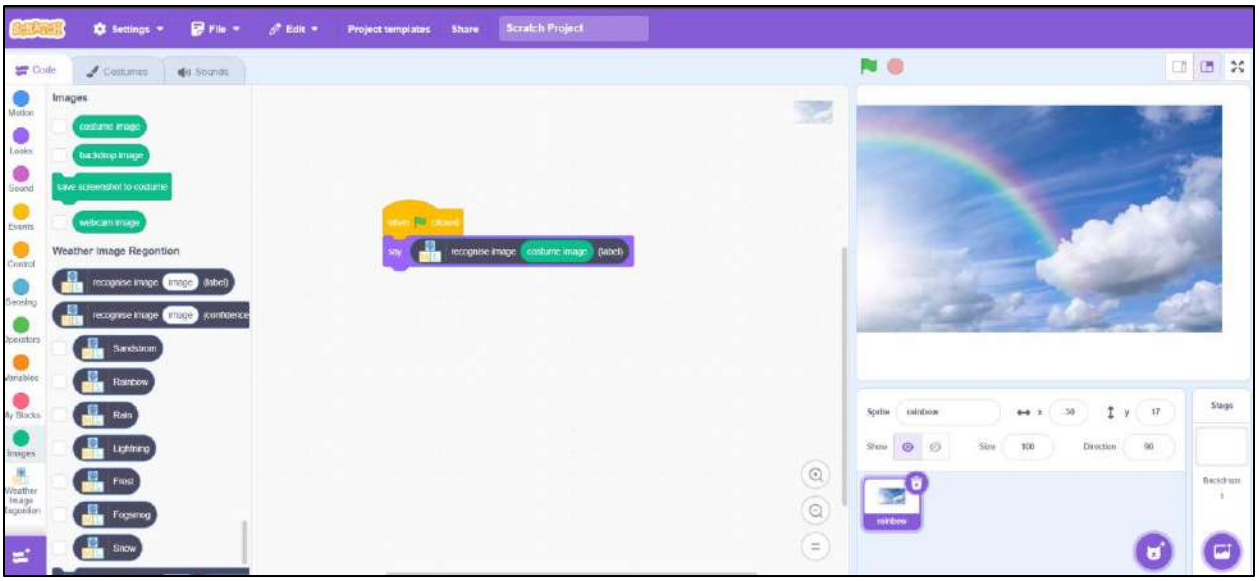
- Click on "**Upload Sprite**"

- Select an image from the **test** folder and click "**Open**"





- Create the code block below (follow the colors of the commands)



- If you want to try another image you will have to upload it as a new "**Sprite**"