



Judge a book

In this project, you will investigate whether it's really possible to judge a book by its cover.

You will make a game in Scratch to see if a computer can guess the genre of a book based only on a picture of its cover.

To do this, you'll first need to train your computer to recognise book covers.

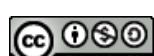
The image shows the Scratch programming environment. The stage features a book cover for "That's not my dinosaur..." by Usborne. A speech bubble on the book says, "I think this book is childrens". The script area contains the following code:

```
when green flag clicked
  repeat (pick random 1 to 100)
    next costume
  end
when this sprite clicked
  think [Hmm... v]
  think [join [I think this book is] [recognise image costume] v]
```

The script palette on the left shows the "judge a book" category, which includes:

- costume image
- backdrop image
- save screenshot to costume
- recognise image costume image (with childrens, sci. fi, romance, thriller options)
- add training data costume image

The costumepalette shows one sprite named "Sprite1" with the book costume applied. The stage palette shows one backdrop named "1".



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1. Go to <https://machinelearningforkids.co.uk/> in a web browser

2. Click on “**Get started**”

3. Click on “**Log In**” and type in your username and password

If you don't have a username, ask your teacher or group leader.

If you've forgotten your password, ask your teacher or group leader to reset it for you.

4. Click on “**Projects**” on the top menu bar

5. Click the “**+ Add a new project**” button.

6. Name your project “judge a book” and set it to learn how to recognise “**images**”. Click “**Create**”

Start a new machine learning project

Project Name *

judge a book

Recognising *

images

What type of thing do you want to teach the computer to recognise?
For words, sentences or paragraphs, choose "text"
For photos, diagrams and pictures, choose "images"
For sets of numbers or multiple choices, choose "numbers"
For voices and sounds, choose "sounds"

CREATE CANCEL

7. You should now see “**judge a book**” in your projects list. Click on it.

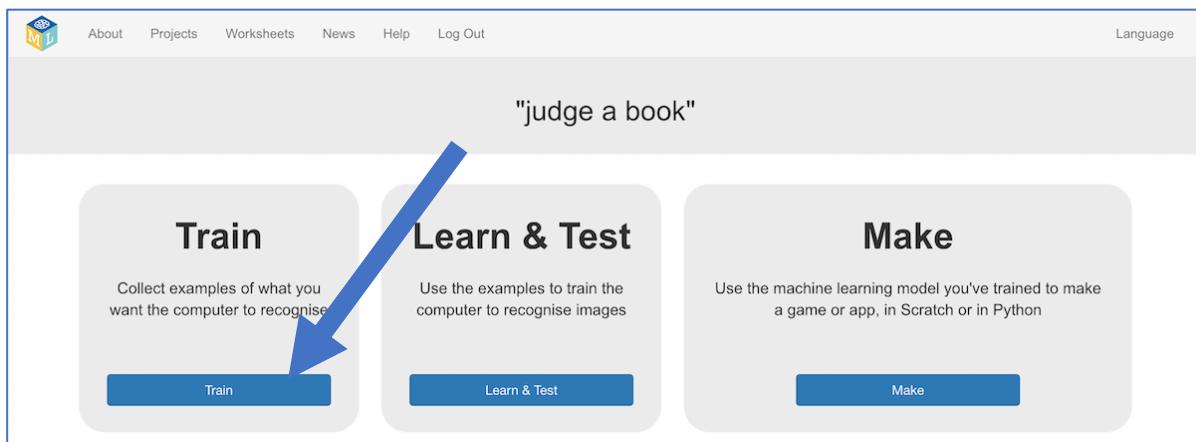
Your machine learning projects

judge a book

Recognising images

Add a new project

8. Click the “Train” button



9. Choose a few genres of books.

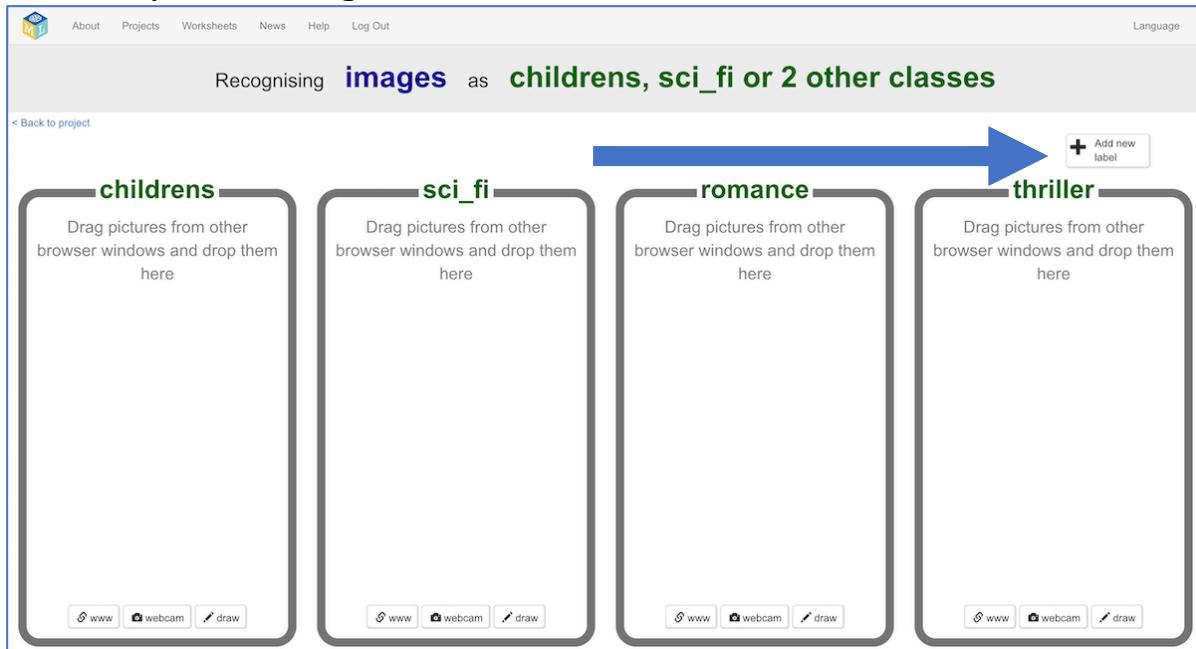
“Genre” means the type of story.

For the rest of this worksheet, I'll be using:

“children’s”, “sci fi”, “romance” and “thriller”.

Choose your own. You don’t have to have four – two or three is fine, too.

10. Use the “+ Add new label” button to create a bucket for each genre of book you’re using.



11. In another web browser window, find pictures of book covers. You need to find a website of pictures of book covers. This could be a library website, or a site that sells books like Amazon. Find a site that arranges books by genre already to make it easier for you. Resize the windows so your training buckets are next to the book site.

The left side of the image shows a web application for image recognition. It has four labeled boxes: 'childrens' (top-left), 'sci_fi' (top-right), 'romance' (bottom-left), and 'thriller' (bottom-right). Each box contains a placeholder image and a '+ Add example' button. The right side shows a screenshot of the Amazon website under the 'Children's Books' category. It displays several book covers with their titles, authors, prices, and ratings. One book, 'The World's Worst Children 2' by David Walliams, is highlighted as a 'Best Seller'.

12. Find pictures of book covers in each genre you've chosen. Drag the best examples into the buckets in your training page. Try and find about 20 examples of each genre.

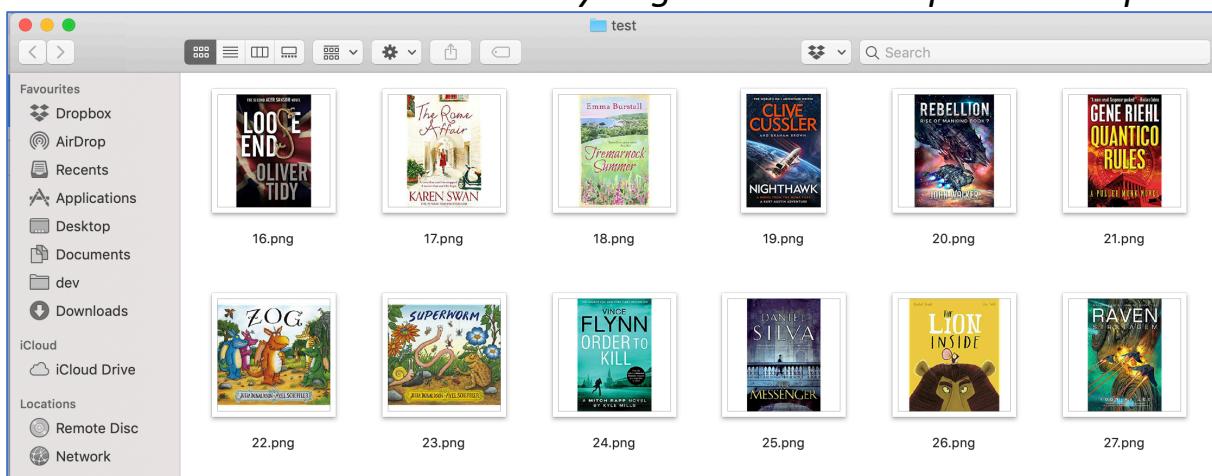
The same web-based image recognition interface as in the previous screenshot, but now all four buckets ('childrens', 'sci_fi', 'romance', 'thriller') are filled with multiple book covers. Each bucket has a count of '20' at the bottom right. The books in each genre are visually distinct, representing a variety of titles and styles within that genre.

13. Save some different pictures of book covers to your computer.

Ask your teacher or group leader if you're not sure how to save a picture from a website.

These are the pictures that you'll use to test the computer with.

You need some of each of your four genres. It's important that none of these are the same as the covers you gave to the computer in step 12.



14. Click the “< Back to project” link. Then click “Learn & Test”.

15. Click “Train new machine learning model”.

As long as you've collected enough examples, the computer should start to learn how to recognise covers from the examples you've given to it.

Machine learning models

< Back to project

What have you done?

You have collected examples of images for a computer to use to recognise when images are childrens, sci_fi or 2 other classes.

You've collected:

- 20 examples of childrens,
- 20 examples of sci_fi,
- 20 examples of romance,
- 20 examples of thriller

What's next?

Ready to start the computer's training?

Click the button below to start training a machine learning model using the examples you have collected so far

(Or go back to the [Train](#) page if you want to collect some more examples first.)

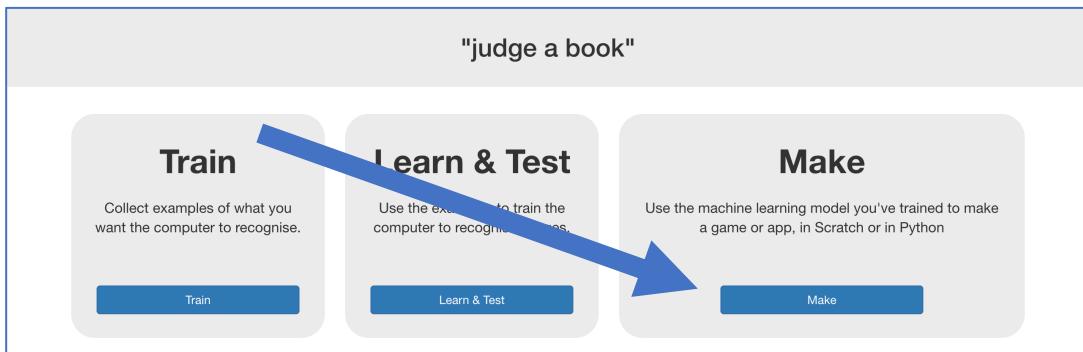
Info from training computer:

Train new machine learning model

16. The training might take a few minutes to complete
You can carry on and start making your Scratch project, but it won't work until the training has finished.

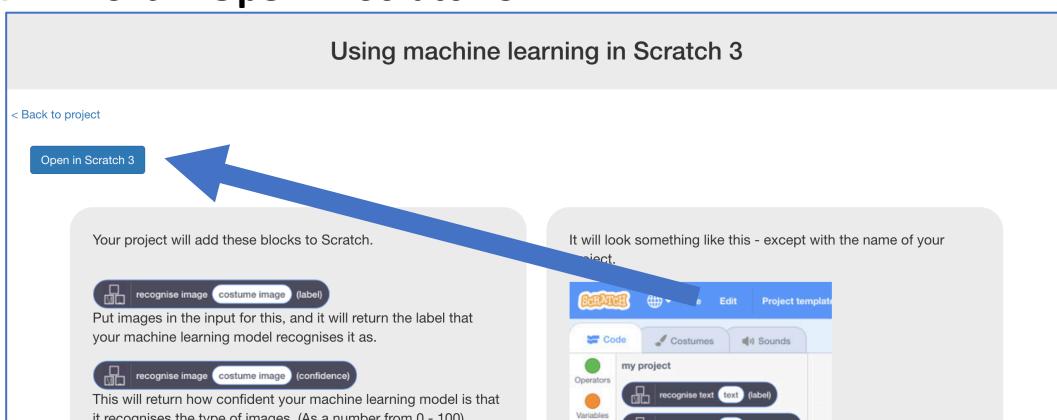
17. Click the “< Back to project link”

18. Click the “Make” button

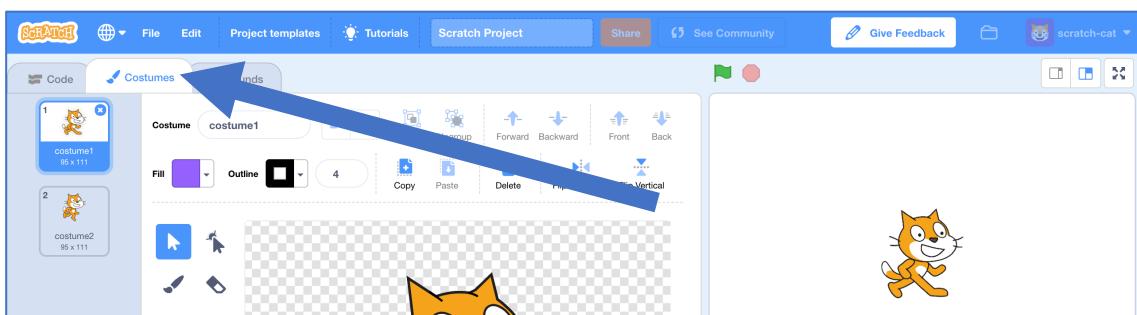


19. Click “Scratch 3”

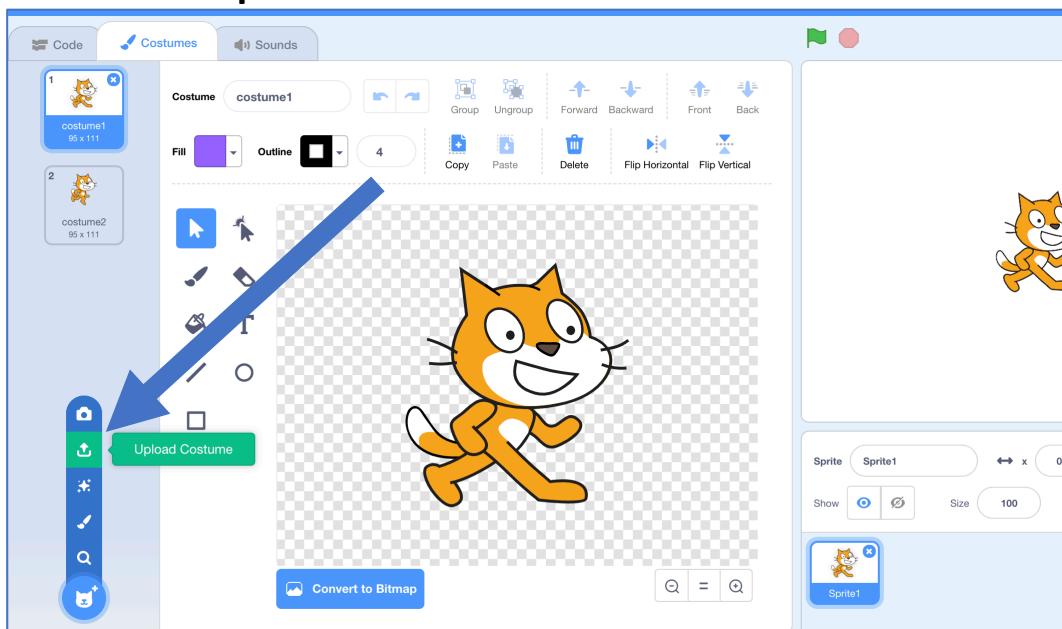
20. Click “Open in Scratch 3”



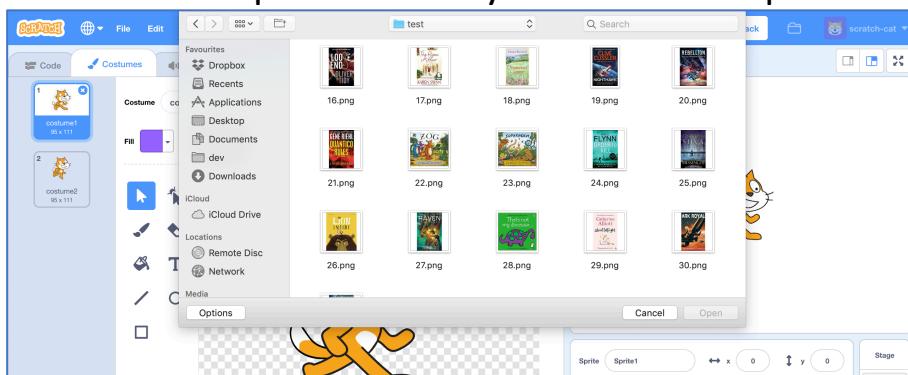
21. Click the “Costumes” tab



22. Click “Upload costume” in the bottom left

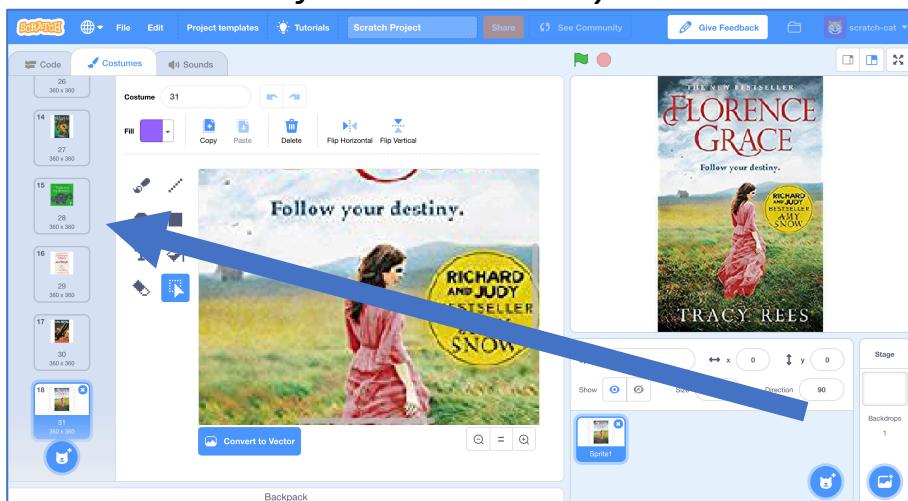


23. Find the pictures that you saved in Step 13



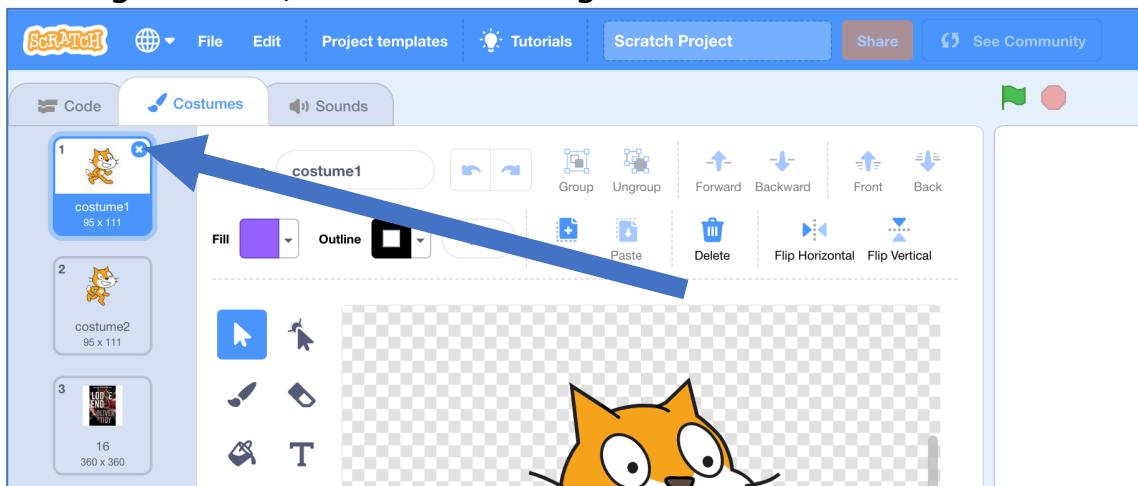
24. Add all of the test covers from Step 13 as costumes

You can add all of these at once – you don’t need to do them one at a time

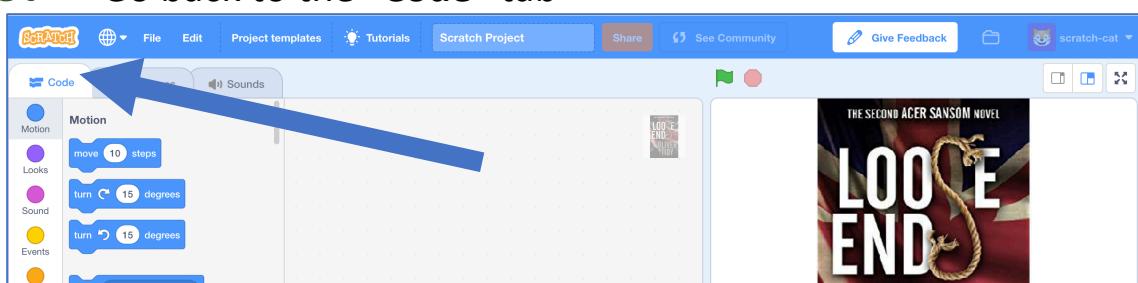


25. Delete **both** of the cat costumes

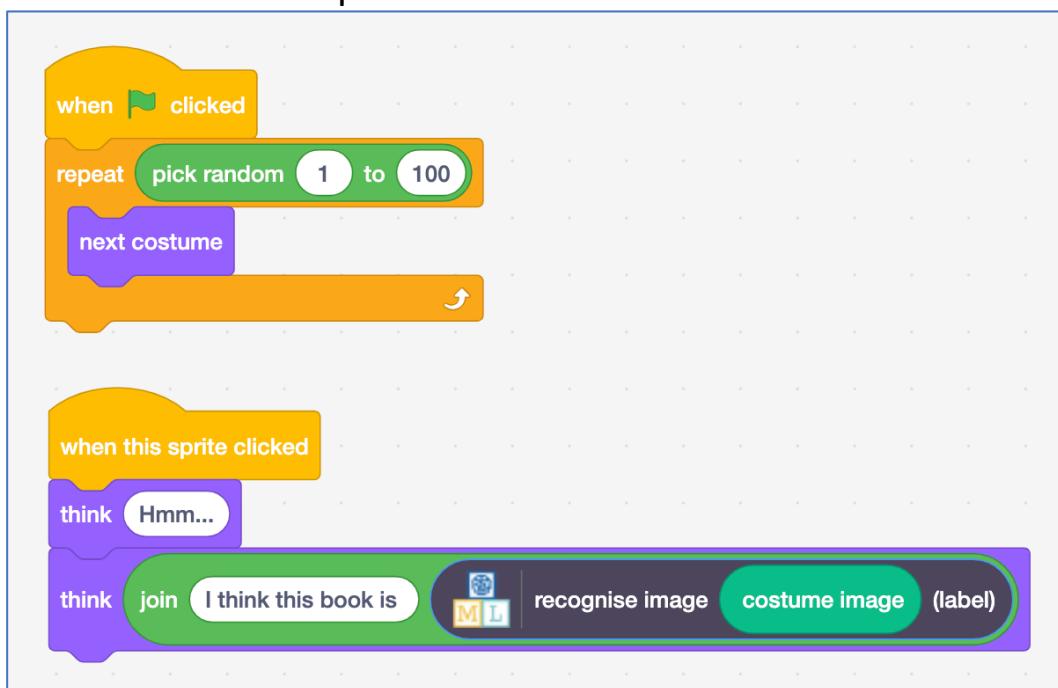
Scroll to the top of the list of costumes and delete the cat costumes by clicking on them, and then clicking the blue cross



26. Go back to the “Code” tab



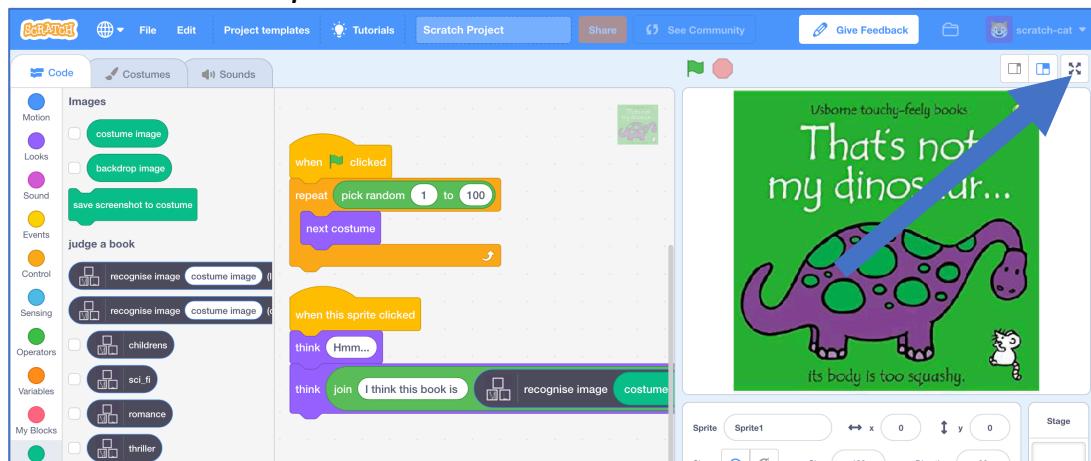
27. Enter this script



28. It's time to test!

Click the full-screen icon, and then click the green flag.

Your Scratch script will choose a random test cover



Click on the book cover. Your code will try to recognise the type of book



What have you done?

You've trained a machine learning model to classify pictures. The computer learned from patterns in the colours and shapes from each of the images you've given it. These were used to recognise new covers.

Ideas and Extensions

Now that you've finished, why not give one of these ideas a try?

Or come up with one of your own?

Alternative project ideas

Instead of book covers, why not try:

- album covers – train a computer to recognise the music genre of an album from a picture of the cover – do pop music albums look different from rap albums?
- movie posters – train a computer to recognise the type of movie based on a picture of the poster – do action movie posters look different from period drama movie posters?