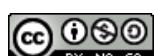
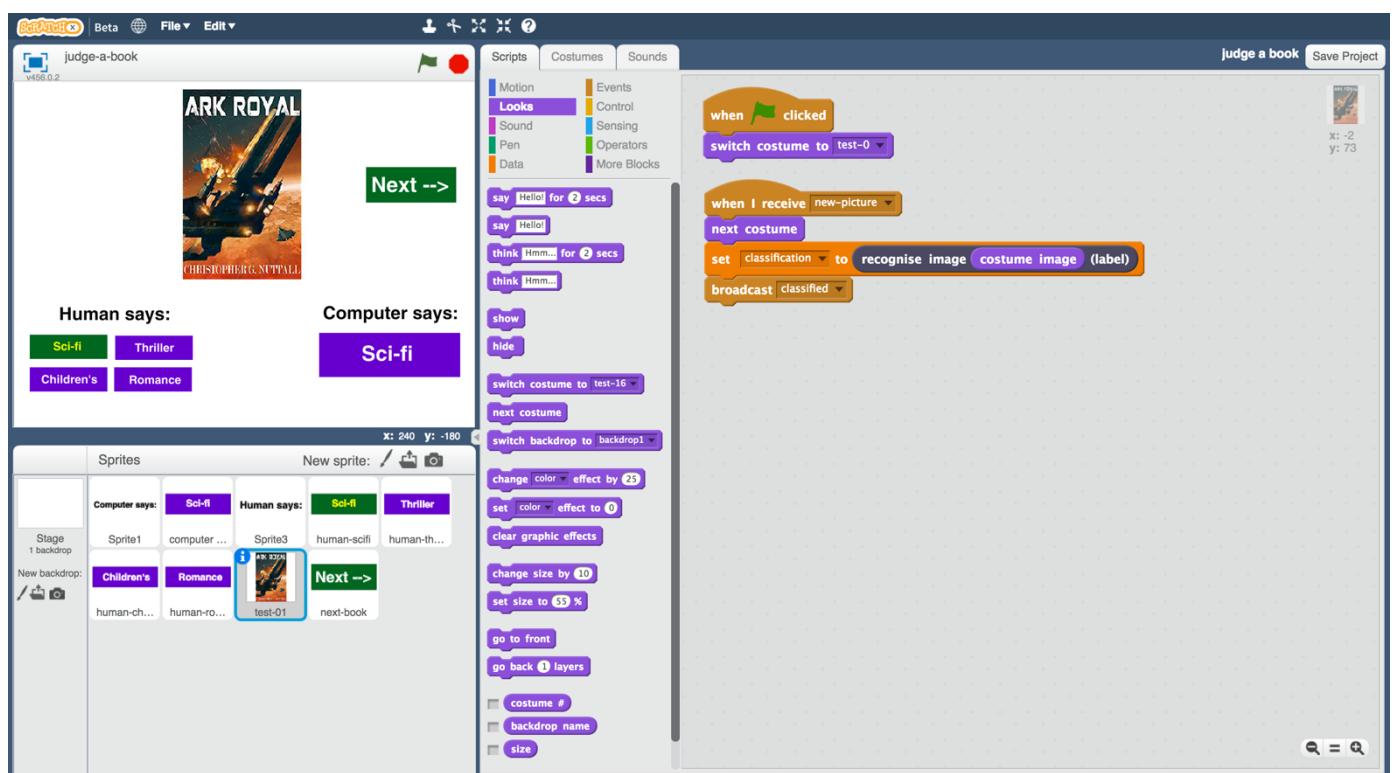


Judge a book

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 for a friend to compete against your computer to see who is better at guessing the genre of a book based only on its cover.

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



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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.
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 *

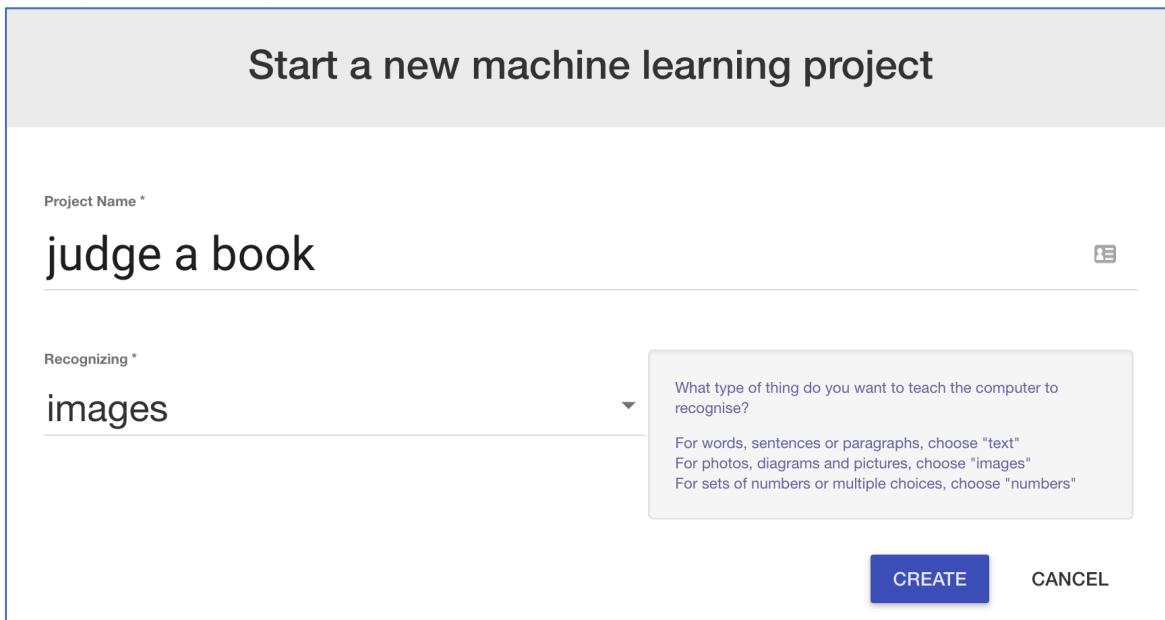
judge a book

Recognizing *

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"

CREATE **CANCEL**



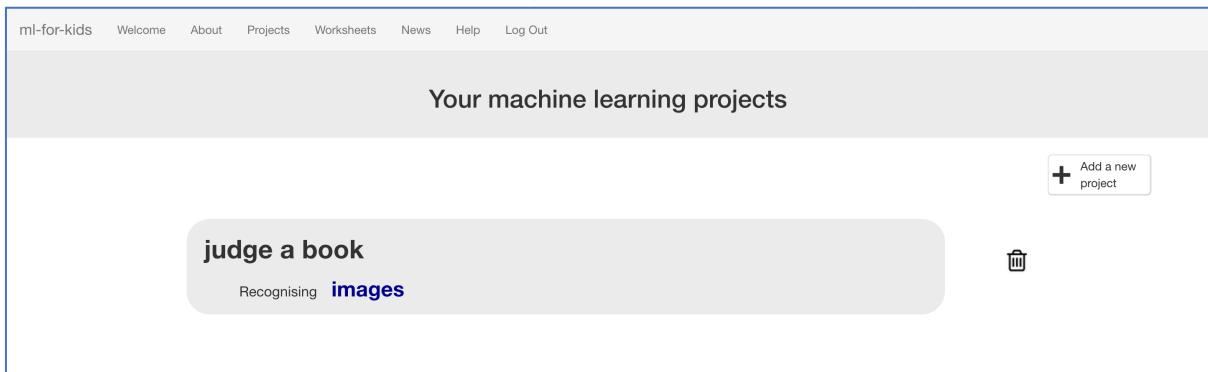
7. You should now see “judge a book” in your projects list. Click on it.

ml-for-kids Welcome About Projects Worksheets News Help Log Out

Your machine learning projects

judge a book
Recognising **images**

+ Add a new project



8. Click the “Train” button

The screenshot shows a web-based machine learning tool for children. At the top, there's a navigation bar with links: ml-for-kids, Welcome, About, Projects, Worksheets, News, Help, and Log Out. Below this, the title "judge a book" is displayed. There are three main interactive buttons arranged horizontally:

- Train**: A grey button with a blue background and white text. Description: "Collect examples of what you want the computer to recognise." Below it is a blue "Train" button.
- Learn & Test**: A grey button with a blue background and white text. Description: "Use the examples to train the computer to recognise images." Below it is a blue "Learn & Test" button.
- Scratch**: A grey button with a blue background and white text. Description: "Use the machine learning model you've trained to make a game in Scratch." Below it is a blue "Scratch" 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”.

The project will be easier if you use these as well. But if you’re feeling adventurous, try choosing between 3 and 5 of your own instead!

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

The screenshot shows the 'ml-for-kids' website interface for a specific project. At the top, there's a navigation bar with links: ml-for-kids, Welcome, About, Projects, Worksheets, News, Help, and Log Out. The main title is "Recognising images as childrens, sci_fi or 2 other classes". Below the title, there are four categories listed in green: "childrens", "sci_fi", "romance", and "thriller". Each category has a corresponding box below it with a "Add example" button at the bottom left. In the top right corner of the main area, there is a button labeled "+ Add new label".

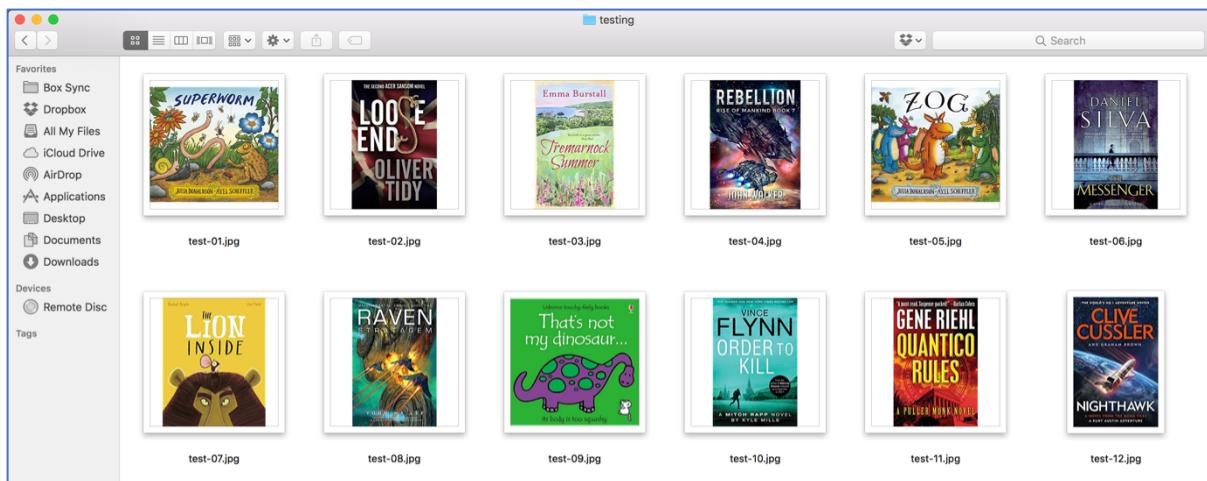
11. In another web browser window, find pictures of book covers. You need to find a website of pictures of book covers. This could be a library website, or a site that sells books like Amazon. Find a site that groups books by genre already to make it easier for you. Arrange the windows so your training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

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.

13. Save some different pictures of book covers to a folder.

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. 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.

ml-for-kids Welcome About Projects Worksheets News Help Log Out

Machine learning models

< Back to project

What have you done?

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

You've collected:

- 22 examples of childrens,
- 22 examples of romance,
- 22 examples of sci_fi,
- 22 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've 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. Wait for the training to complete. This might take a few minutes.

Machine learning models

< Back to project

What have you done?

You've started training a machine learning model using the examples of images that you collected.

It's been training since Saturday, July 29, 2017 9:22 PM.

This normally takes a few minutes, but can take a little longer if the training computer is very busy.

What's next?

You could wait for the machine learning model to finish being trained. Or, you could try the machine learning quiz below, to check what you've learned.

Info from training computer:

Model started training at: Saturday, July 29, 2017 9:22 PM
Current model status: Training
Model will automatically be deleted after: Saturday, July 29, 2017 10:22 PM

[Cancel training](#)

17. Click the “< Back to project link”. Then click “Scratch”.

Using machine learning in Scratch

< Back to project

Your project will add these blocks to the **More Blocks** tab in Scripts.

recognise images (label)
Put images in the input for this, and it will return the label that your machine learning model recognises it as.

recognise images (confidence)
This will return how confident your machine learning model is that it recognises the type of images. (As a number from 0 - 100).

childrens sci-fi romance thriller
These blocks represent the labels you've created in your project, so you can use their names in your scripts.

This means you can do something like this:

It will look something like this - except with the name of your project.

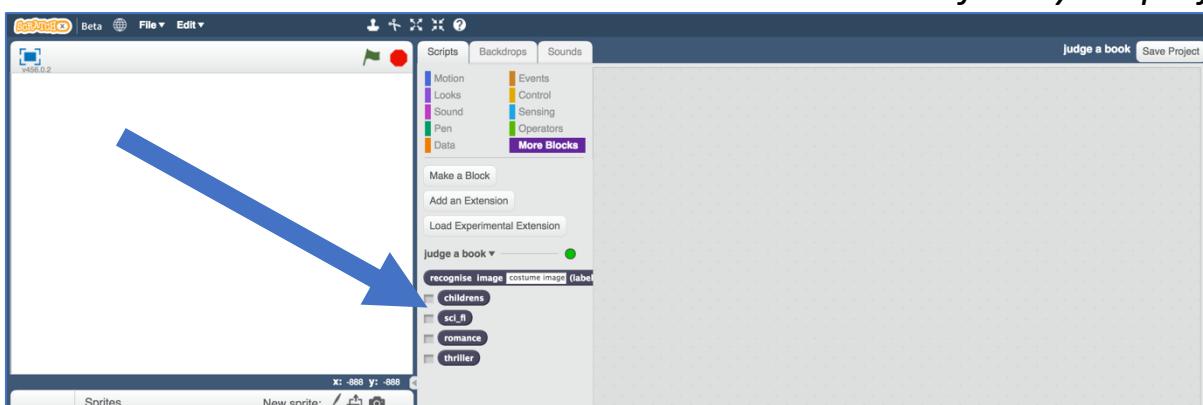


The coloured circle next to your project name tells you if your machine learning model is okay.

- means your model is trained and ready to go
- means your model hasn't finished training yet
- means something went wrong. Go back to the [Learn & Test](#) page to see what went wrong with training.

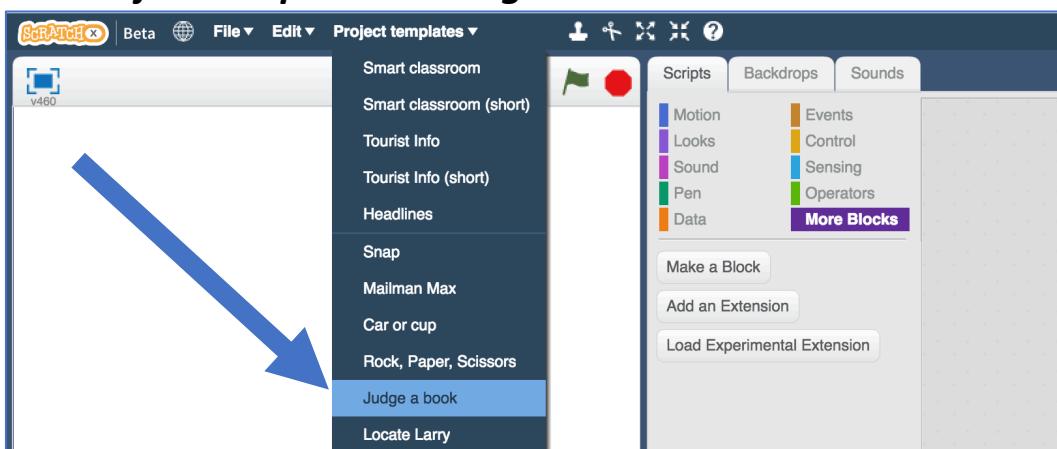
18. Click the “Open in Scratch” button to start making the game.

You should see new blocks in the “More blocks” section from your project.



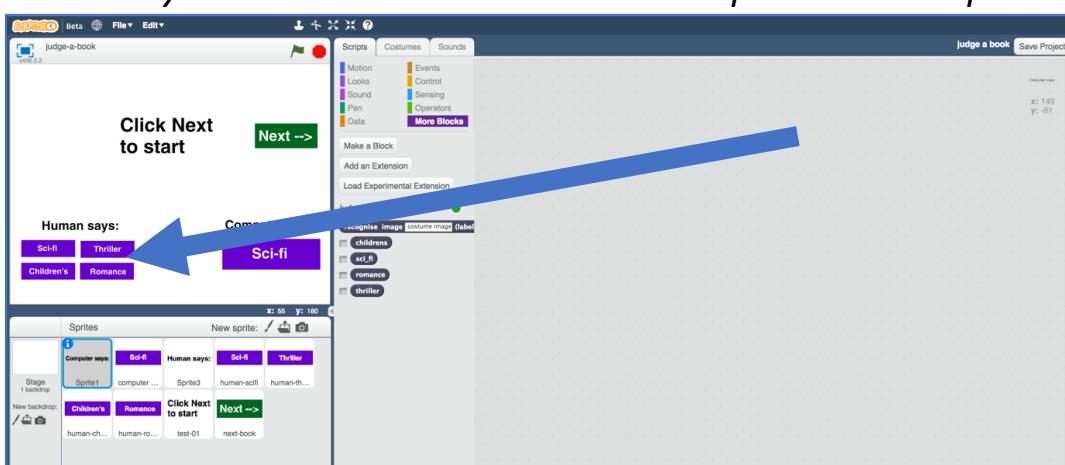
19. Open the Judge a Book project template.

Use Project templates -> Judge a book



20. If you used different book genres to me, update the “Human says” buttons. Use the costume editor to update them so the labels match.

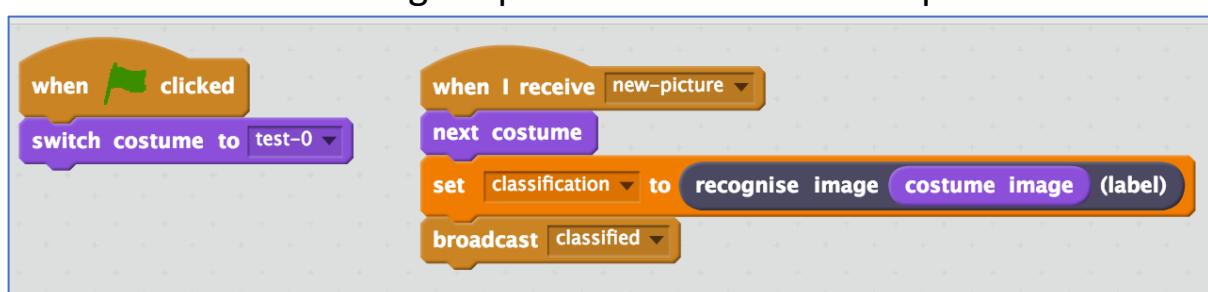
There are a few scripts in these buttons that make them look different when they are clicked. You don’t need to update the scripts.



21. Click on the “**test**” sprite

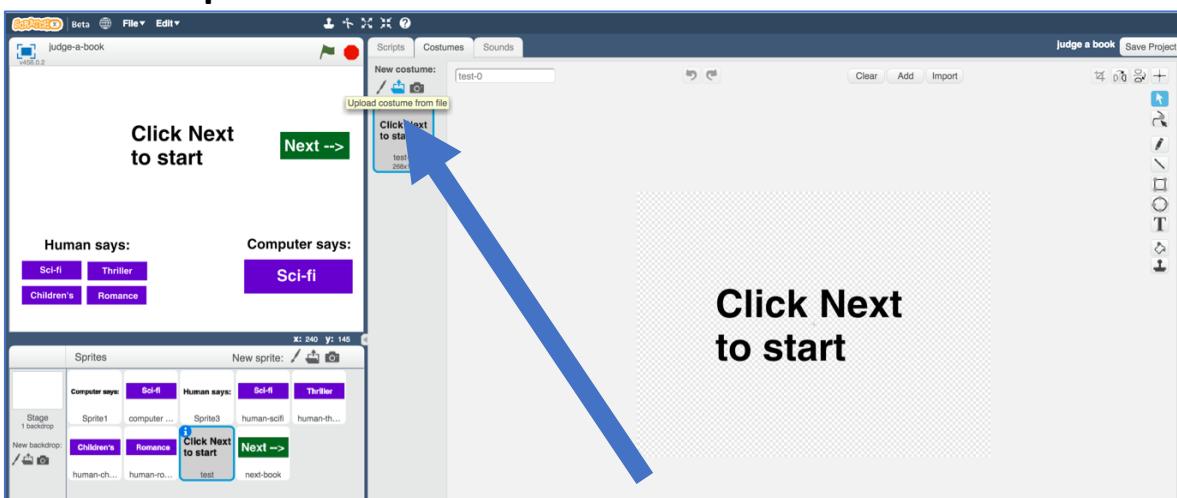
It’s the one that has the “Click Next to start” message.

22. Enter the following script blocks for the “**test**” sprite

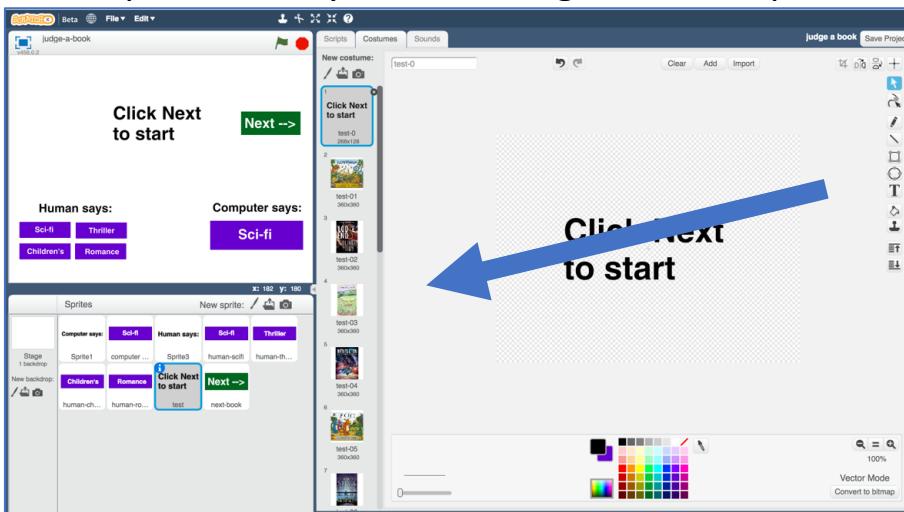


23. Click the “Costumes” tab.

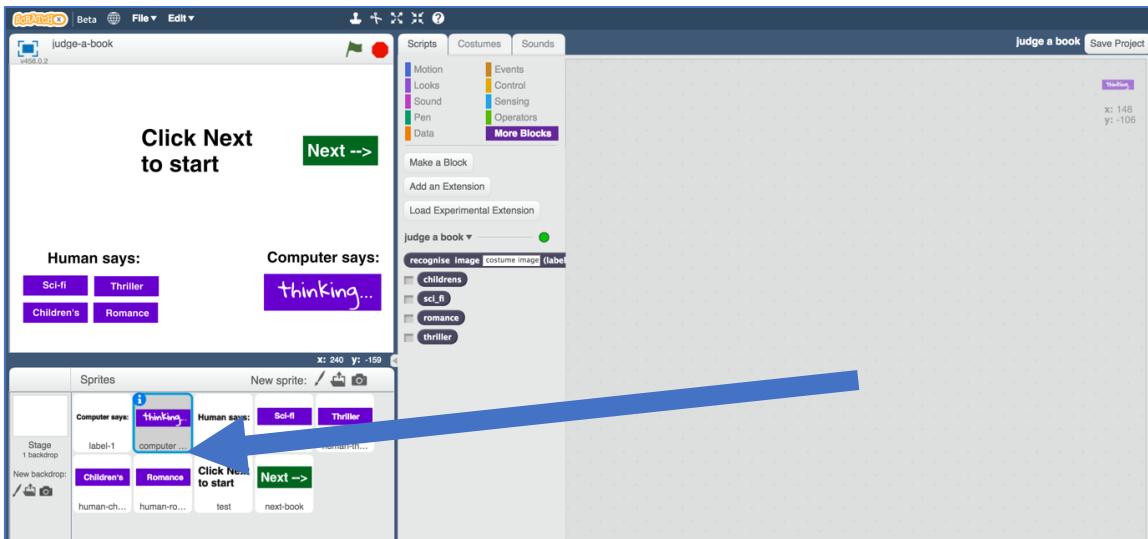
Click the “Upload costume from file” button with the folder icon.



24. Upload all of your test images from step 13.



25. Click on the “computer guess” sprite



26. Enter the following script blocks for the “computer guess” sprite
This is how the computer will display its guess for each book cover you will test it with. If you’re using different book genres, update it to match.



27. It’s time to test!

To make this fair, you haven’t shown the test images to the machine learning computer.

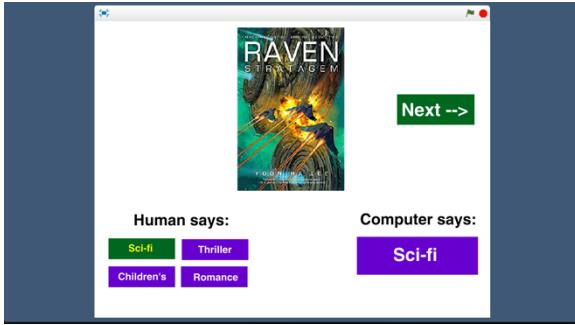
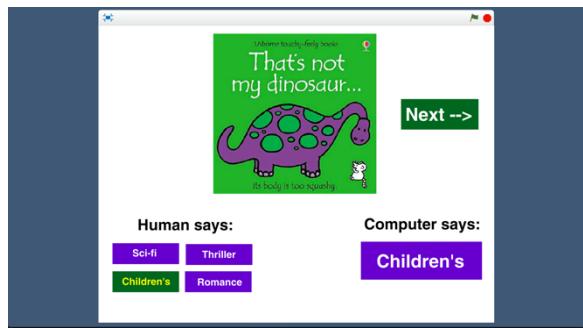
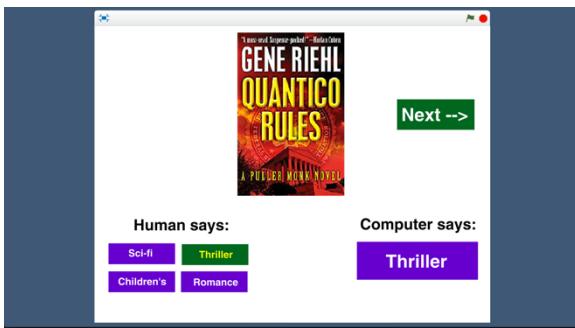
To be equal, find a friend to test this that hasn’t seen your test images.
Click the fullscreen icon, and then click green flag.

They should click the “Next” button and they’ll see a book cover.

Ask them to guess what genre book it is from the cover, and click one of the “Human says” buttons on the left to confirm their choice. (It doesn’t do anything other than look different).

The computer will try and decide what genre it looks like, and display its answer under “Computer says” on the right.

If they click “Next” they will move to the next book – ask them to keep going through all your test images.



What have you done?

You've created a game that tests whether people and computers can judge a book by its cover.

Specifically, 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 photos.

You've also learned about a key way that we measure how good a machine learning system is: by comparing its performance against a person. This is a common approach for tasks where the right answer isn't already known.

A good example is the task of recognising the words someone is saying : “speech recognition”. Humans miss one to two words out of every 20 we hear. So computer systems trained to recognise speech are compared against this.

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?

Keeping score

Can you update the Scratch game so that it keeps score?

Is the computer as good at recognising book genres as the people that you can get to test it?