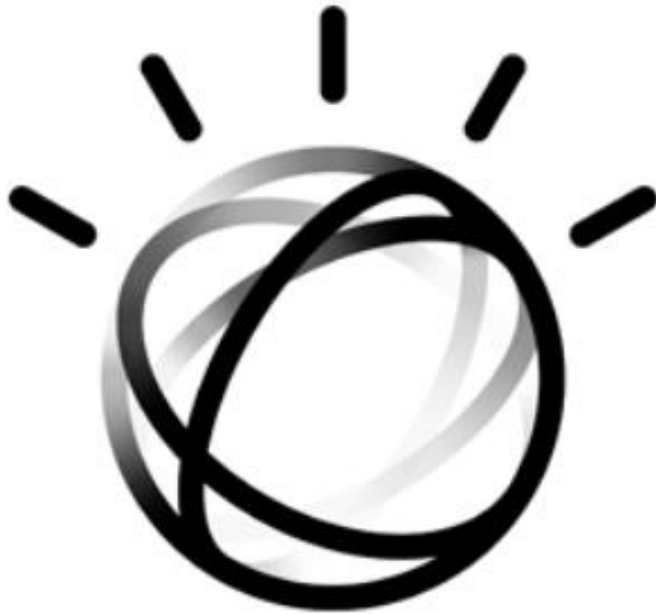


# TRAIN YOUR COMPUTER WITH MACHINE LEARNING

## JUDGE A BOOK BY ITS COVER

AN IBM VOLUNTEERS ACTIVITY



DEE

@STEMDEEP

DEEPSTEM.WORDPRESS.COM

MAY 28 2019

MARSHALL MIDDLE SCHOOL

LET'S GET TO  
KNOW EACH  
OTHER!

Your  
Name



Your  
Grade




Coolest  
Technology



# QUICK SURVEY


## Programming

- Who has attended the previous machine learning session?
  - What computer languages have you coded?
- 



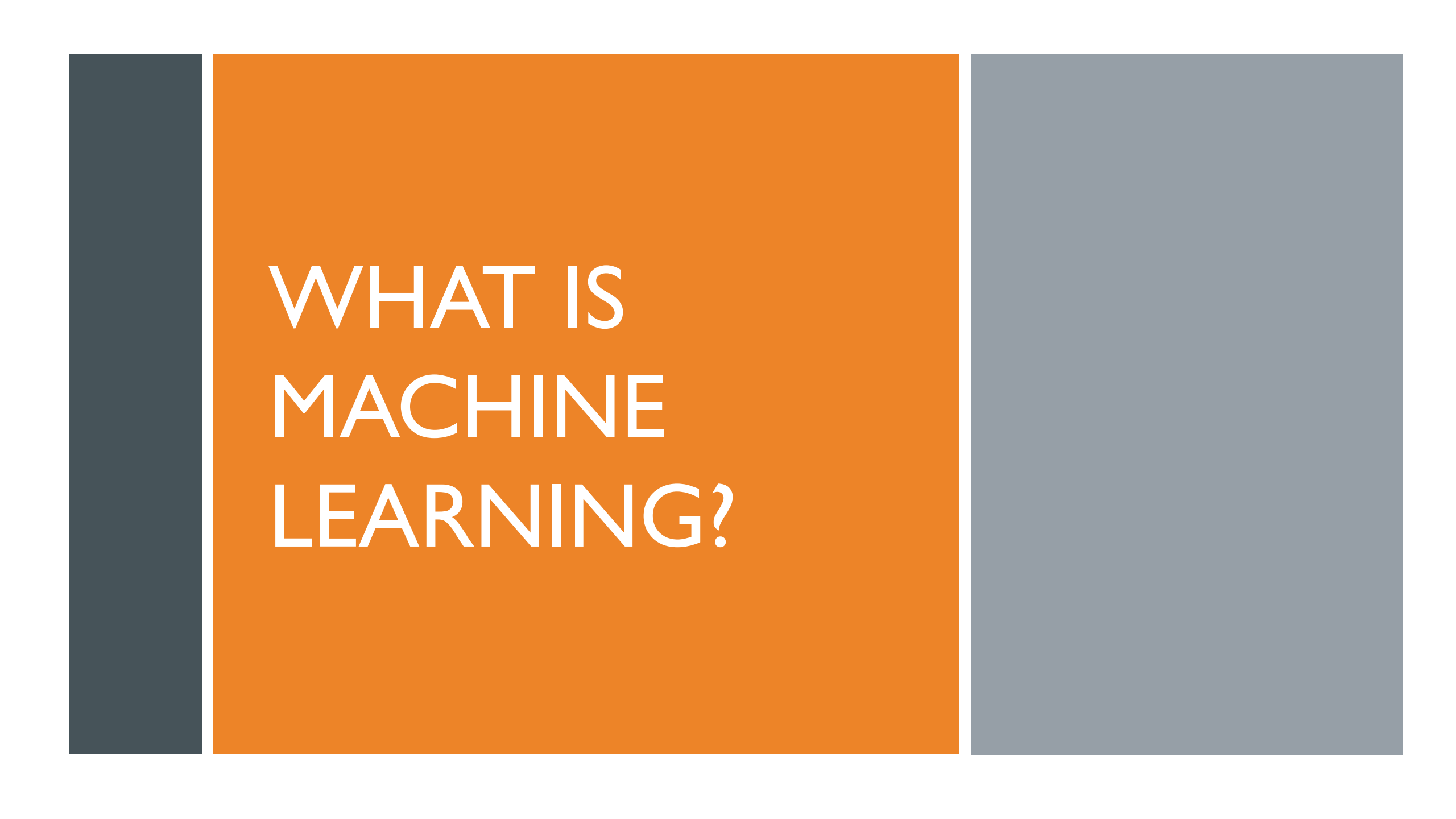
# QUICK SURVEY

## Scratch

- Who has used scratch before?
  - What did you build?
- 



# WHAT IS ARTIFICIAL INTELLIGENCE?



# WHAT IS MACHINE LEARNING?

## PLAN FOR TODAY

- Programming vs. Machine Learning
- Hands-on activity: Train a machine learning model to recognize and classify images of book covers by genre. We will then test the machine learning model against a human using a Scratch Project.

# PROGRAMMING

BREAKING  
DOWN A  
TASK INTO A  
SERIES OF  
STEPS THAT  
CAN BE  
FOLLOWED

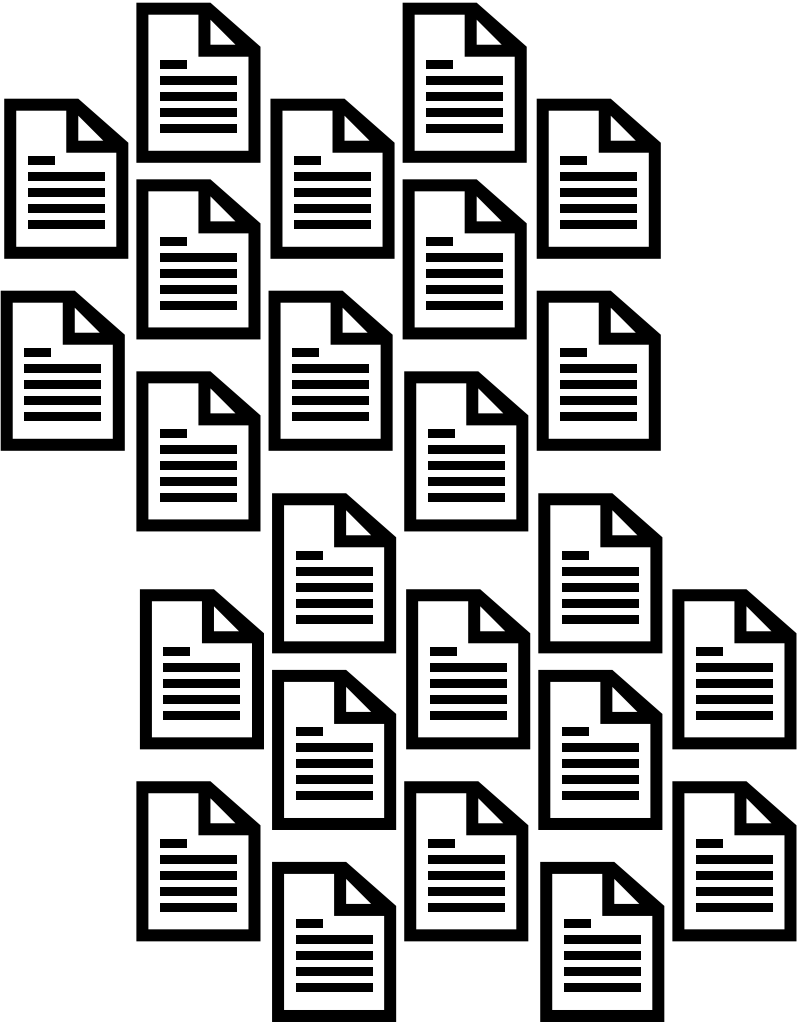


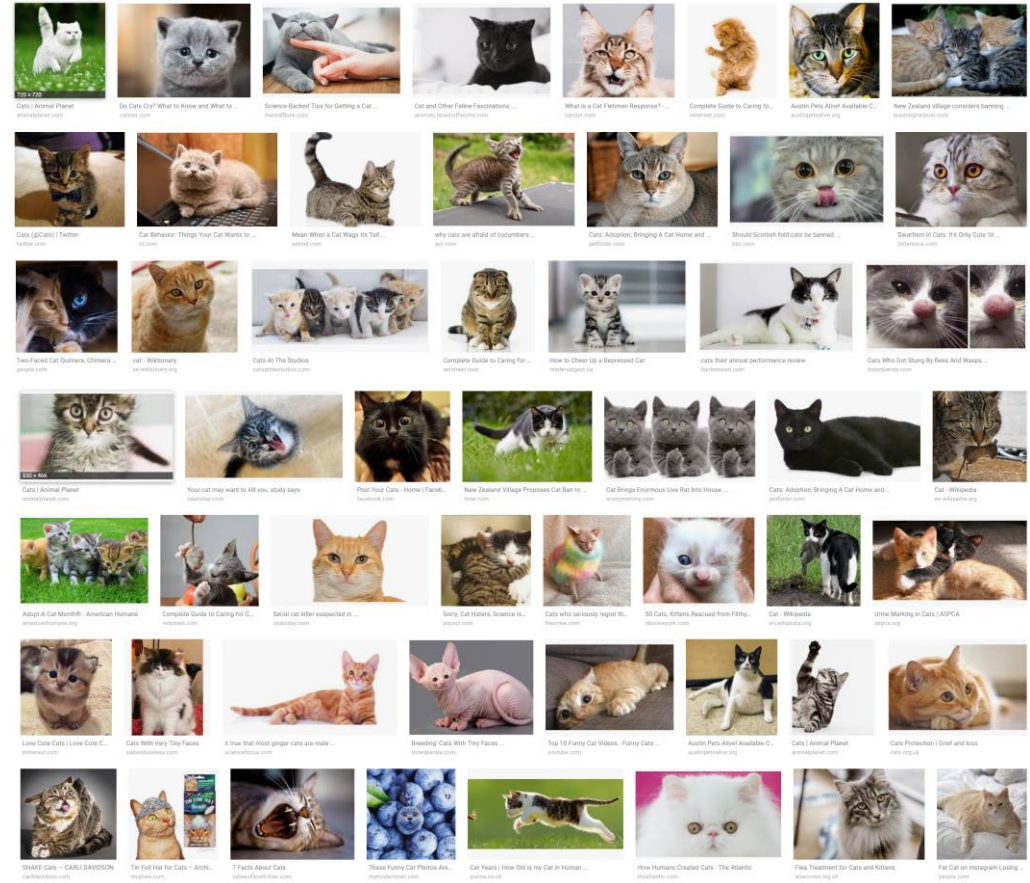
```
when clicked
  go to x: 0 y: 90
  delete all of Players
  delete all of Player ID
  forever
    if screen = title then
      show
    else
      hide
```

```
when clicked
  set frame to 0
  forever
    point in direction 90 + sin of frame * 20
    change frame by 15
```

# MACHINE LEARNING

LEARNING  
HOW TO  
PERFORM A  
TASK FROM A  
COLLECTION  
OF EXAMPLES





Images from Google Search for "cats"

## AI Assistant



Integrate diverse conversation technology into your application.

### [Watson Assistant](#)

Build an AI assistant for a variety of channels, including mobile devices, messaging platforms, and even robots.

## Knowledge



Get insights through accelerated data optimization capabilities.

### [Discovery](#)

Unlock hidden value in data to find answers, monitor trends and surface patterns.

### [Discovery News](#)

Access pre-enriched news content in real-time.

### [Natural Language Understanding](#)

Natural language processing for advanced text analysis.

### [Knowledge Studio](#)

Teach Watson to discover meaningful insights in unstructured text.

## Empathy



Understand tone, personality, and emotional state.

### [Personality Insights](#)

Predict personality characteristics through text.

### [Tone Analyzer](#)

Understand emotions and communication style in text.

## Vision



Identify and tag content then analyze and extract detailed information found in an image.

### [Visual Recognition](#)

Tag and classify visual content using machine learning.

## Speech



Convert text and speech with the ability to customize models.

### [Speech to Text](#)

Easily convert audio and voice into written text.

### [Text to Speech](#)

Convert written text into natural-sounding audio.

## Language




Analyze text and extract meta-data from unstructured content.

### [Language Translator](#)

Translate text from one language to another.

### [Natural Language Classifier](#)

Interpret and classify natural language with confidence.



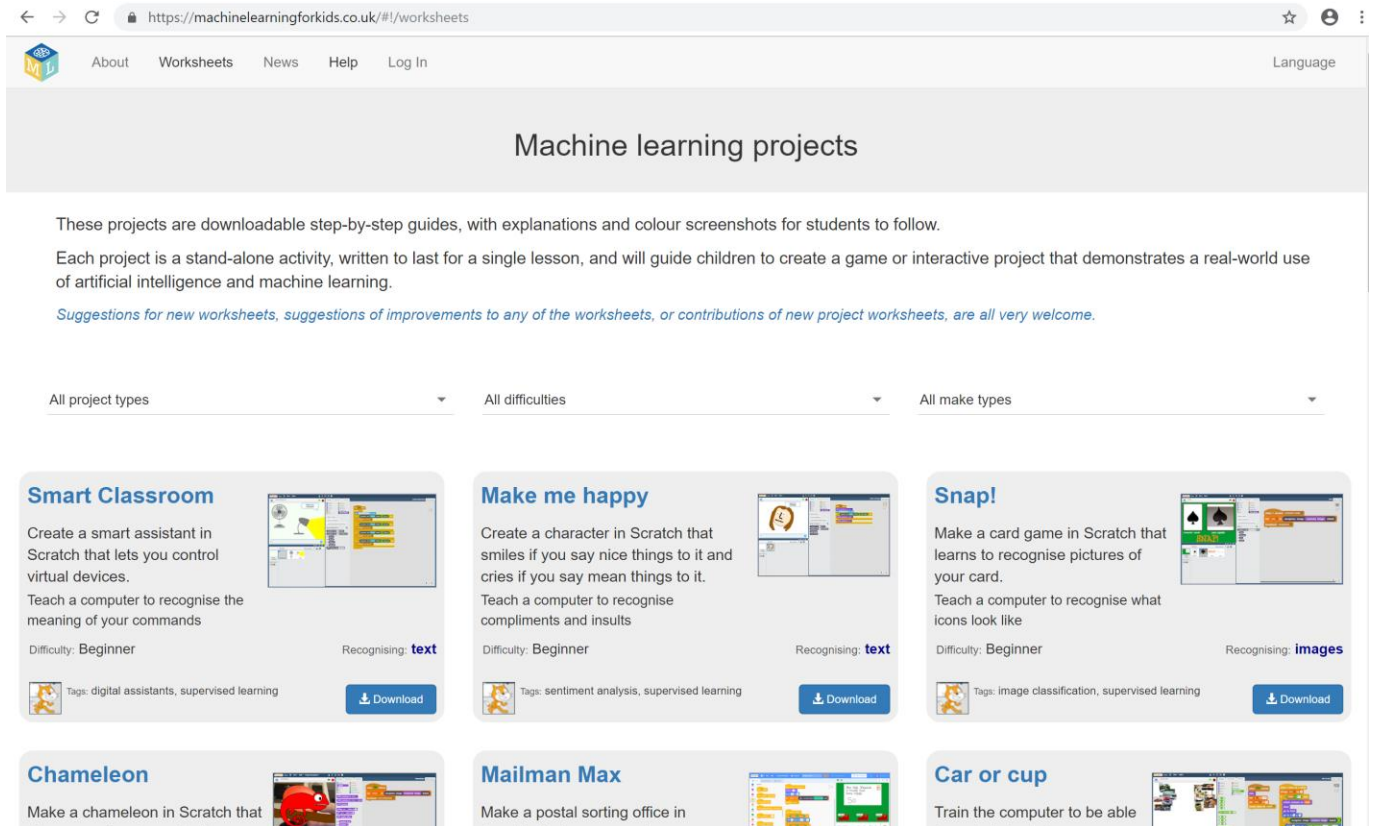
GOAL:  
BUILD A MACHINE  
LEARNING MODEL TO  
GUESS WHETHER A BOOK IS  
A GRAPHIC NOVEL OR A  
MYSTERY BOOK BASED ON  
ITS COVER

# HANDS-ON ACTIVITY

- Create Watson machine learning model with any **two** genres
  - **Mysteries, Graphic Novels**, Fairy Tales, Picture Books, Non-Fiction
- Train the model with images of book covers
  - Find 20 examples of book covers for each of the two genres
  - Copy links to 20 images of each genre from the Carnegie Library Catalog
  - Save 5 images of each genre from the Carnegie Library Catalog
  - Secret tips for choosing images (and winning)
- Open Judge a Book Scratch Project
- Edit the project to reflect the two genres and connect to your model
- Test the Scratch Project
- Compete with a human!

# LET'S GET STARTED!

<https://machinelearningforkids.co.uk>



The screenshot shows a web browser displaying the 'Machine learning projects' page on the website <https://machinelearningforkids.co.uk>. The page features a navigation menu with 'About', 'Worksheets', 'News', 'Help', and 'Log In'. Below the navigation is a header for 'Machine learning projects'. The main content area contains an introductory paragraph, a list of project types, difficulties, and make types, and a grid of project cards. Each card includes a title, a brief description, a difficulty level, a 'Recognising' category, and a 'Download' button.

Machine learning projects

These projects are downloadable step-by-step guides, with explanations and colour screenshots for students to follow.

Each project is a stand-alone activity, written to last for a single lesson, and will guide children to create a game or interactive project that demonstrates a real-world use of artificial intelligence and machine learning.

*Suggestions for new worksheets, suggestions of improvements to any of the worksheets, or contributions of new project worksheets, are all very welcome.*

All project types All difficulties All make types

**Smart Classroom**  
Create a smart assistant in Scratch that lets you control virtual devices.  
Teach a computer to recognise the meaning of your commands  
Difficulty: Beginner  
Recognising: **text**  
Tags: digital assistants, supervised learning  
[Download](#)

**Make me happy**  
Create a character in Scratch that smiles if you say nice things to it and cries if you say mean things to it.  
Teach a computer to recognise compliments and insults  
Difficulty: Beginner  
Recognising: **text**  
Tags: sentiment analysis, supervised learning  
[Download](#)

**Snap!**  
Make a card game in Scratch that learns to recognise pictures of your card.  
Teach a computer to recognise what icons look like  
Difficulty: Beginner  
Recognising: **images**  
Tags: image classification, supervised learning  
[Download](#)

**Chameleon**  
Make a chameleon in Scratch that

**Mailman Max**  
Make a postal sorting office in

**Car or cup**  
Train the computer to be able



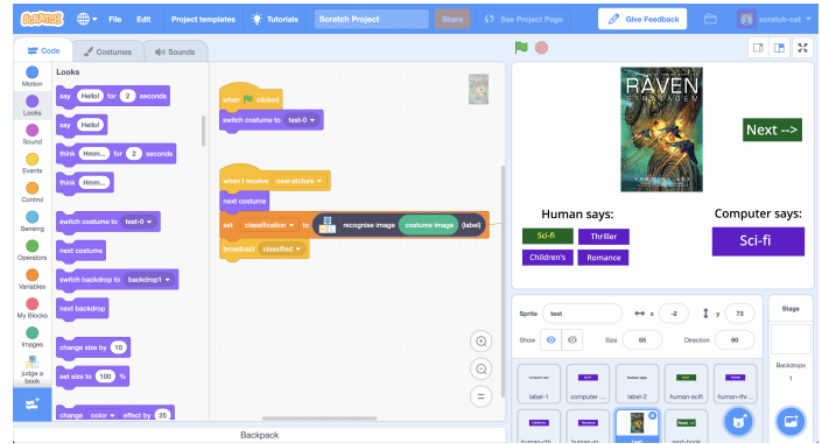
# ML Judge a book


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.

FOLLOW  
ALONG ON  
THE  
WORKSHEET



 This project worksheet is licensed under a Creative Commons Attribution Non-Commercial Share-Alike License  
<http://creativecommons.org/licenses/by-nc-sa/4.0/>

# EXTRA CREDIT

Check out Ideas and Extensions

Pick another project @  
<https://machinelearningforkids.co.uk>

## 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?

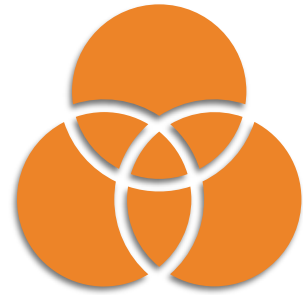
Is the computer as good at recognising book genres as the people that you can get to test it?

### 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?

# CONCEPTS



**Sentiment Analysis**



**Supervised Learning**

**What did  
you learn?**

**Will you  
come back?**

**QUICK SURVEY**