Machine Learning For Kids :: Teachers' notes

Worksheet	Shoot the bug
Activity	Train a computer to play a Breakout-style arcade game in Scratch.
Objective	**Teach a computer to play a game** • How machines are taught to play games • Decision tree learning as a way for computers to learn how to play games.
Difficulty level	Beginner
Time estimate	1 hour
Summary	Students train a model by playing a game in Scratch. The machine learning model will be trained based on how they play. They will use this to get Pac-Man to play by itself.
Topics	AI in games, decision tree learning

Setup

Each student will need:

Print-outs	Project worksheet (download from https://machinelearningforkids.co.uk/worksheets) Blocks in Scratch scripts are colour-coded, so printing in colour will make it easier for students.
Access	Username and password for machinelearningforkids.co.uk

Class account will need:

API keys	None

Customizing

If you use **PRIMM** approaches with your class, add a step where students predict how the project template works.
If you want to **increase the amount of coding** involved, delete some of the code from the project template and add steps to the worksheet so students code it themselves.
If you want to **encourage problem solving**, delete some of the detail in the worksheets and provide more general instructions instead.
Project template files & worksheets in MS Word format are available so you can **modify them to suit your class**.

Template	https://github.com/IBM/taxinomitis-docs/tree/master/scratch-templates
Worksheets	https://github.com/IBM/taxinomitis-docs/tree/master/project-worksheets/msword

Help

Potential issues	• "https://machinelearningforkids.co.uk" is a long URL to type for some children. You may find it easier to set up a bookmark that they can click on instead. • You may want to encourage students to modify the game before they start training their model – such as by removing, or moving and resizing, the obstacle. • Collecting training examples can be quite time-consuming, so the template includes almost all of the coding required for this project. If you have time, you may want to remove some of the scripts from the template to give your students a chance to implement it themselves. For example, code blocks like how the ball bounces off obstacles may provide an opportunity to discuss the maths involved. • Creating this as a whole-class project and allowing all students to contribute training examples to a shared pool of training data should train a much more effective machine learning model. General troubleshooting and help at https://machinelearningforkids.co.uk/help