Machine Learning For Kids :: Teachers' notes

Worksheet	Top Trumps
Activity	Train a computer to be able to play the Top Trumps card game in Scratch.
Objective	**Teach a computer to play a game** • Collecting training is easier than manually labelling training data. • Computers can learn to play games where the correct answer cannot be known, by predicting the likelihood of each outcome.
Difficulty level	Advanced The Scratch script is long and complex. Most of it is provided in a starter project file, but finding the right places to make changes needs care.
Time estimate	1 – 2 hours
Summary	Students will train the computer to play Top Trumps by playing the game in Scratch. The machine learning model will be trained based on the choices that they make while playing.
Topics	decision tree learning, reinforcement learning, categorical data

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.
Files	top-trumps.sbx (download from https://machinelearningforkids.co.uk/worksheets)
Access	Username and password for machinelearningforkids.co.uk

Class account will need:

API keys	None

Help

Potential issues	• The most common bug in student Scratch scripts is to make the wrong choice in orange drop-down blocks (e.g. choosing "you" instead of "computer"). Encourage students to copy carefully. Working in pairs can help avoid mistakes. • The computer is trained using the decisions made by the student when they play. This is inverted when used by the computer to make decisions. (e.g. the computer chooses a move that will result in "lose" because the best move for the computer is one that results in the player "losing"). • It is important to close and re-open the Scratch browser window after each time a machine learning model is trained, otherwise Scratch will keep using previous moves. General troubleshooting and help at https://machinelearningforkids.co.uk/help