Lesson Plan

Lesson 1.1: Neural Networks
Lesson 1.2: Image Recognition Training
Lesson 2.1: Programming Fundamentals
Lesson 2.2: Conditional Programming
Lesson 2.3: Loops
Lesson 2.4: Functional Programming
Lesson 3.1: Basic and Advance Training
Lesson 3.2: AI Interfacing
Lesson 3.3: Autonomous Systems
Lesson 4 : Debugging your code

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Lesson 3.1 Basic and Advanced Training

Warm-up (10 mins)
Main Activity (20 mins)
Wrap up (10 mins)
Extras (10 mins)

Prerequisites: In our previous chapters we discussed about AI and Neural Networks along with some important programming concepts. If you haven't already read, please refer pages 3 to 15.

Lesson Overview: Students will understand how to train an AI model. We'll play game levels 1.1 and 1.2 and thus teach AI model training.

Lesson objective:

1. To make students understand training an AI model.
2. Also to make students familiar with image recognition and how AI is trained to achieve it.

Requirements:

1. Images of famous personalities used in Chapter 1.2 - Image Recognition of this book.

Getting started:

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1. We'll be playing Section 1.1 and 1.2 from our rule book on Basic and Advanced Training. The aim should be to teach students more about AI model training.
2. Remind students about how they learned about basics of AI and Image recognition in Chapter 1.1 and 1.2. Ask few questions to refresh their concepts.
3. After the rule book is explained, arrange the cards and the board.

AI training:

AI models are trained by feeding large amounts of data to a neural network which alters the parameters of itself to 'fit' the data into it. In simple words, the neural networks adjusts itself to the data provided to it by adjusting and fine tuning the hyper-parameters. So, the main output of a trained AI model is a collection of these parameters most of the time. However, these parameters are not enough to understand the output of a model as we need to recreate the functions from them that will process the new data given to it to infer (classify/predict).

You can always train your model on an existing model. This is called transfer learning, where you use an existing model/framework and provide your data to be trained on top of that. There are several libraries and frameworks out there for model training. Some of them are listed below for your reference:

1. Tensorflow (by Google) and Google AI
2. Scikit Learn (SkLearn)
3. Caffe
4. Keras
5. Theano
6. Torch

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You can choose the framework for your application depending upon your requirements and framework features that best suits all your needs.

Board Activity:

1. Explain the rules for Basic Training (Section 1.1) where we use simple commands and loops to go through the board.
2. Explain the rules for Advanced Training (Section 1.2) where we use advanced functions to train the model.
3. For image recognition training, the player has to collect each piece of image on the board before reaching the end. The game cannot end until all the pieces are acquired.
4. Let each player reviews their code cards and write the sequence of our programming code. The player who reaches the destination first wins the game.

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