AI Bootcamp Syllabus

Part 1: Introduction to Machine Learning

Title	Topic	Time	Week
Introduction to AI	◆ Intro to AI ◆ Why Python ◆ Virtual Environments ◆ Bootcamp Roadmap	1-1.5 hrs	1
Linear Algebra for ML	◆ Numpy Package ◆ Linear Algebra	2 hrs	
Statistics for ML	◆ Pandas ◆ Basic Statistics ◆ Spam email detection using Naive Bayes	2-3 hrs	
Data Preprocessing	◆ Exploratory Data analysis ◆ Data Manipulation	2 hrs	
Traditional ML	◆ Traditional ML algorithms ◆ Get best Classifier for Titanic Dataset	2-3 hrs	2
Unsupervised learning	◆ Apply K-Means ◆ Anomaly Detection	2 hrs	

Part 2: Artificial Neural Networks

Title	Topic	Time	Week
Logistic Regression	◆ Regression ◆ Loss function ◆ Gradient descent	2 hrs	2
Neural Networks	◆ Neural Networks ◆ Activation ◆ Back propagation	2 hrs	

Clothes Classifier	◆ Introduction to TensorFlow ◆ Build a neural network to classify different types of clothes	2 hrs	3
Advices for neural networks training	◆ Train/dev/test sets ◆ Bias/Variance ◆ Regularization ◆ Normalization ◆ Optimizers ◆ Batch normalization	2 hrs	

Part 3: Computer Vision

Title	Topic	Time	Week
Convolution Neural Networks	◆ Convolution Layers ◆ Fashion MNIST classifier using CNN ◆ Types of CNNs	2 hrs	3
Transfer Learning	◆ Transfer Learning ◆ Fine-tuning MobileNet on some image dataset	2 hrs	
Face recognition (Depending on time)	◆ Triplet loss ◆ Build a face recognition system	2 hrs	4
Image segmentation	◆ Train an image segmentation model	4 hrs	

Part 4: Sequence Models

Title	Topic	Time	Week
Recurrent Neural Network	◆ Recurrent Neural networks ◆ LSTM ◆ GRU ◆ Types of RNNs	2 hrs	4
Word embeddings	◆ Word embeddings	3 hrs	5

	◆ Emojify: Sentiment Analysis through emojis		
Music Generator	◆ Build a music generator using a recurrent neural network	2-3 hrs	5

Final Project (week 6): Building YOLO algorithm