# **Aimix Manifestos﻿ (Our Guiding Principles)**

* Explain like I am 10
* Simple > complex
* Jupyter notebook > Powerpoint
* Drawings > words
* Clear code > efficient code
* No shame in asking the same question a billion times
* No stupid questions
* Impactful solution > fancy AI
* Understanding > length of lecture time
* Syntax is everything
* Multiple contributors > one contributor

# **Aimix Syllabus**

# **Part 1**

**Bits of python**

* Pandas data structure
* Numpy
* A brief tour of Jupyter notebook hidden gems
* Object-Oriented Programming
* A Gentle Introduction to Deep Learning Frameworks
  + Pytorch and Tensorflow

**Mathematics of DL for everyone with Live Demo in Jupyter Notebook**

* Deep Learning on a Page
* Introduction to vectors, Matrices, and Tensors from ML perspective
* Introduction to Vector calculus from ML perspective
* The Rosenblatt Perceptron
  + A Walkthrough of the Perceptron Algorithm
  + Python Implementation of the Perceptron Algorithm
* Common Activation Functions and their Derivatives for the mortals
* How does a machine learn?
  + Forward and Backward Propagation
  + A Deep Dive into Backpropagation using Simple Additions and Subtractions
  + The Nature of the Error Functions
  + Gradient Descent
* How Do Linear and Logistics Regressions Work?
  + Python implementation of key concepts from scratch

# **Part 2**

**The building blocks of Neural Network with Live Demo in Jupyter Notebook**

* Fundamentals of Machine Learning with Live Demo in Jupyter Notebook
  + Defining Generalization
  + Tour of various approaches to improve Generalization
  + ML Model Evaluation
* Overview of other machine learning algorithms

# **Part 3**

**Live Demos: Shallow and Deep Neural Network**

* + Fully Connected Network Applied to Multi-class Regression
  + Fully Connected Network Applied to Multi-class Classification
    - Training and Inference

# **Part 4**

**Convolutional Neural Network Applied to Image Classification**

* Fundamentals of Convolutional Neural Network
  + Live Demo: The Convolution operations for the mortal
  + Live Demo: The Max-Pooling Operation for the mortal
* Applications
  + Convolutional neural Network Applied to Image Classification
  + An Image Segmentation Example
* CNN Architectural Patterns

# **Part 5**

**Live Demos: Deeper CNNs and Pretrained Models**

* VGGNet
* GoogLeNet
* ResNet
* BERT

# **Part 6**

**Best Practices from Deloitte**

**Time series forecast**

* Clients Project to Showcase above concepts
* Ethical AI and Data Ethics
* Trustworthy AI
* ReadyAI
* CortexAI
* Age of With
* Deloitte Center for AI Computing