

## **Pepsi Co. Training Syllabus**

### **1. Day 1 - Demystifying Artificial Intelligence - Lecture**

- a. AI in our everyday lives
    - i. Recommendation systems (netflix, youtube, etc)
    - ii. computer vision (self driving, object detection, segmentation analysis)
    - iii. natural language understanding (siri, alexa, GPS, google translate, email spam detection, etc)
    - iv. Job/college/loan/credit applications
    - v. Fraud detection
    - vi. Optimizing store inventory/shelving/staffing
  - b. What is AI?
    - i. Computers + Math + Data
    - ii. How does it work?
  - c. Data
    - i. What is data
    - ii. Data sources
    - iii. Data storage
  - d. Subsets of AI
    - i. Supervised vs Unsupervised vs Reinforcement Learning
    - ii. Machine learning
    - iii. Deep learning
    - iv. Reinforcement learning
  - e. Introduction to ML algorithms
    - i. What tasks are associated with what algorithms
    - ii. Flavors of ML algorithms
    - iii. Examples of ML algorithms
  - f. Identifying & Productizing ML use-cases
    - i. Consistent data
    - ii. Large volume
    - iii. Interactive vs Non-Interactive
    - iv. Single Record vs Batch
  - g. Conclusion - Day 1 - Quiz
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### **2. Day 2 - Machine Learning Algorithm Foundations - Lecture**

- a. Establish Term Glossary
- b. The Artificial Neuron
- c. Open-source software

- i. Layers of auto-ml (code a network/keras & torch/auto-ml)
  - d. The components of ML algorithms (rudimentary concepts)
  - e. Walkthrough an example with real data
  - f. Conclusion - Day 2 - Quiz
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### **3. Day 3 - Functions, Data Structures & EDA - Jupyter Notebook**

- a. Data Structures
  - b. Basic Functions
  - c. Intermediate Functions
  - d. Working with Datasets
    - i. Reading in different data
    - ii. Examining features
    - iii. Visualizations
  - e. Conclusion - Day 3 - Quiz
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### **4. Day 4 - Basic ML Algorithms (Regression) - Jupyter Notebook**

- a. Regression
    - i. Different types
    - ii. How it works
    - iii. Examples
  - b. Interpreting model results
    - i. Accuracy
    - ii. ROC/AUROC/F1/recall/precision/etc
  - c. Conclusion - Day 4 - Quiz
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### **5. Day 5 - Feature Selection & Feature Engineering - Jupyter Notebook**

- a. Feature Selection
  - i. Choosing relevant features for your ML model
- b. Feature Engineering
  - i. Process of cleaning data for a ML model
- c. Data Pipeline
  - i. Putting it all together
  - ii. Preparing data to train a ML model
- d. Conclusion - Day 5 - Quiz

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## **6. Day 6 - Intermediate ML Algorithms - Trees/Ensemble Methods (RFs) - Jupyter Notebook**

- a. Classification
    - i. Decision Trees
    - ii. Random Forest
  - b. Regression
    - i. Decision Trees
    - ii. Random Forest
  - c. Conclusion - Day 6 - Quiz
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## **7. Day 7 - Deep Learning Algorithms - Neural Networks (ANNs) - Jupyter Notebook**

- a. Deep learning overview
  - b. Feature Engineering (w/ OOP)
  - c. The basic, feed-forward ANN
    - i. Model 1 - tabular data
    - ii. Model 2 - image data
  - d. Open-source models
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## **8. Day 8 - E2E Build - Putting It All Together - Jupyter Notebook**

- a. Given a dataset, experiment with different methods & models.
  - b. Develop the end-to-end process from scratch and choose the optimal solution
    - i. Feature Selection / Eng
    - ii. Define the task and experiment with different algorithms
    - iii. Tune the model
  - c. Create interpretable visualizations
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## **9. Day 9 - Productization - Infrastructure - Lecture + VSCode**

- a. Different types of deployment
  - i. Interactive vs non-interactive (client facing or not)
- b. The client facing API
- c. The internal system

- d. Things to consider
    - i. Model drift
    - ii. Model re-training
    - iii. Throughput & latency
  - e. Cloud infra
    - i. azure/aws/gcp/redis/etc
    - ii. Worker jobs
  - f. Local machine setup for next lesson
  - g. Conclusion - Day 9 - Quiz
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## **10. Day 10 - Productization - Deployment - VSCode**

- a. Develop API in VSCode using flask
- b. Send data to model & get results
- c. Deployment & hosting of the API
- d. Conclusion - Day 10 - Quiz