# **110 DAYS OF MACHINE LEARNING**

Welcome to the 110 Days of Machine Learning Challenge! Now note that this challenge is supposed to be for 22 weeks. That’s giving an allowance of 2 days weekly for rest and unwinding. Please try to observe the rest you need as you take on this challenge. All the best!

## \*\*Week 1-2: Python Programming, NumPy, and Pandas\*\*

* - Day 1: Python Basics, Variables, and Data Types
* - Day 2: Control Flow and Loops in Python
* - Day 3: Functions and OOP in Python
* - Day 4: Introduction to NumPy and Pandas
* - Day 5: NumPy Array Manipulation and Operations
* - Day 6: Pandas DataFrames and Data Cleaning
* - Day 7: Data Visualization with Matplotlib
* - Day 8: Advanced Visualization with Seaborn
* - Day 9: Exploratory Data Analysis (EDA) with Pandas and Visualization
* - Day 10: Project: EDA on a Dataset

## \*\*Week 3-4: Scikit-learn and Model Evaluation\*\*

* - Day 10: Introduction to Scikit-learn and Regression Models
* - Day 11: Classification Models in Scikit-learn
* - Day 12: Clustering and Dimensionality Reduction with Scikit-learn
* - Day 13: Model Evaluation and Cross-Validation
* - Day 14: Hyperparameter Tuning and Model Selection
* - Day 15-17: Project: Building a Supervised Learning Model
* - Day 18-20: Project: Unsupervised Learning and Clustering

## \*\*Week 5-6: Deep Learning Framework (TensorFlow or PyTorch)\*\*

* - Day 21: Introduction to Deep Learning and the Chosen Framework
* - Day 22: Building Neural Networks in TensorFlow or PyTorch
* - Day 23: Training Neural Networks and Overfitting
* - Day 24: Transfer Learning and Pre-trained Models
* - Day 25-27: Project: Image Classification using Deep Learning
* - Day 28-30: Project: NLP with Deep Learning (Text Classification or Language Generation)

## \*\*Week 7-9: Computer Vision and NLP\*\*

* - Day 31: Image Preprocessing and Augmentation
* - Day 32: Object Detection and Image Segmentation
* - Day 33-34: Project: Object Detection Model
* - Day 34-35: Project: Image Segmentation Model
* - Day 35-36: Project: Integrating Computer Vision into Web App
* - Day 37: Text Preprocessing and Tokenization
* - Day 38: Text Classification and Sentiment Analysis
* - Day 39-41: Project: Building an NLP Model for Text Classification
* - Day 41-43: Project: Language Generation with GPT-like Model

## \*\*Week 9-10: Reinforcement Learning\*\*

* - Day 44: Introduction to Reinforcement Learning
* - Day 45: Q-Learning and Deep Q Networks (DQNs)
* - Day 46: Policy Gradient Methods
* - Day 47-48: Project: Implementing a Reinforcement Learning Agent
* - Day 49-50: Project: Solving an RL Environment with OpenAI Gym

## \*\*Week 11: Geospatial Analysis\*\*

* - Day 51: Introduction to Geospatial Data and GeoPandas
* - Day 52: Spatial Data Manipulation and Queries
* - Day 53: Project: Analyzing Geospatial Data for Locations
* - Day 54: Project: Geospatial Visualization on a Map
* - Day 55: Project: Integrating Geospatial Data into Web App

## \*\*Week 12: RESTful API and Model Deployment\*\*

* - Day 56: Creating RESTful APIs with Flask or FastAPI
* - Day 57: Deploying ML Models with Docker
* - Day 58: Project: Building a Web API for ML Model Deployment
* - Day 59: Project: Dockerizing the Web App
* - Day 60: Project: Deploying the Web App on a Cloud Platform

## \*\*Week 13-14: MLflow and Model Versioning\*\*

* - Day 61: Introduction to MLflow and Experiment Tracking
* - Day 62: Managing Model Versions with MLflow
* - Day 63-64: Project: Tracking Experiments with MLflow
* - Day 65-66: Project: Managing Model Versions with MLflow
* - Day 67-70: Project: Building an MLflow Workflow for Model Development

## \*\*Week 15-16: MLOps and Continuous Integration (CI)\*\*

* - Day 71: Introduction to MLOps and CI/CD for ML
* - Day 72-73: Setting Up CI/CD Pipelines for ML Models
* - Day 74-76: Project: Building a CI Pipeline for ML Models
* - Day 77-78: Project: Automating Model Deployment with CI/CD
* - Day 79-80: Project: Monitoring ML Models in Production

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## \*\*Week 17: Docker, Kubernetes, and Cloud Platforms\*\*

* - Day 81: Introduction to Docker and Containerization
* - Day 81-82: Building Docker Images for ML Applications
* - Day 82: Deploying Containers with Docker
* - Day 83: Introduction to Kubernetes and Orchestration
* - Day 83: Deploying ML Models with Kubernetes
* - Day 84: Introduction to Cloud Platforms (AWS, Google Cloud, Azure)
* - Day 85: Deploying ML Models on AWS
* - Day 85: Deploying ML Models on Google Cloud
* - Day 85: Deploying ML Models on Azure

## \*\*Week 18: Data Engineering\*\*

* - Day 86: Introduction to Data Engineering and ETL Process
* - Day 86-87: Building Data Pipelines
* - Day 88-89: Data Processing with Apache Spark
* - Day 89-90: Data Storage and Retrieval with Cloud Databases

## \*\*Week 19: Model Interpretability and Explainability, Time Series Analysis\*\*

* - Day 91: Interpreting ML Models' Decisions with Feature Importance
* - Day 92: Understanding LIME (Local Interpretable Model-Agnostic Explanations)
* - Day 93: SHAP (SHapley Additive exPlanations) for Model Interpretability
* - Day 94: Introduction to Time Series Analysis and Forecasting
* - Day 94: Time Series Data Preprocessing and Visualization
* - Day 95: Time Series Forecasting with ARIMA and SARIMA
* - Day 95: Time Series Forecasting with Prophet

## \*\*Week 20-21: GANs, Automated Machine Learning (AutoML), Bayesian Methods, Quantum Machine Learning (QML)\*\*

* - Day 96: Introduction to GANs and Generative Models
* - Day 96-97: Building GANs for Image Generation
* - Day 98: Introduction to Automated Machine Learning (AutoML)
* - Day 98: Using Auto-sklearn for Automated Model Selection
* - Day 99: Introduction to Bayesian Methods and Probabilistic Modeling
* - Day 100-101: Hyperparameter Tuning with Bayesian Optimization
* - Day 102: Introduction to Quantum Computing and Quantum Machine Learning
* - Day 102: Quantum Algorithms for Machine Learning

## \*\*Week 21-22: Integration and Final Project\*\*

* - Day 102-103: Integrate all components into a cohesive web app for relocation assistance.
* - Day 104-105: Work on improving the user interface, user experience, and recommendation engine.
* - Day 106-107: Gather feedback from users and make iterative improvements to the app.
* - Day 108-109: Deploy the web app on a cloud platform and ensure it can handle concurrent users.
* - Day 110: Finalize the web app, perform thorough testing, and prepare for public release.