6-Month AI/ML Foundations Plan (Free Resources)

6-Month AI/ML Foundations Plan with Free Resources

Month 1: Python Programming Basics

Week 1:

- Python syntax, variables, data types, control flow
- Resources:
  Python for Everybody (Coursera, audit for free): https://www.coursera.org/specializations/python
  Automate the Boring Stuff (Free online book): https://automatetheboringstuff.com/

Week 2:

- Functions, loops, conditionals
- Practice coding problems on HackerRank (Python domain)

Week 3:

- Lists, dictionaries, file handling
- Practice coding challenges on LeetCode (easy)

Week 4:

- Classes and OOP basics
- Practice coding problems on LeetCode, Python basics

Month 2: Python for Data Science

Week 5:

- NumPy basics: arrays, math operations
- Resource: NumPy Quickstart Tutorial: https://numpy.org/doc/stable/user/quickstart.html

Week 6:

- Pandas basics: DataFrames, reading CSV files
- Resource: Pandas 10-minute tutorial: https://pandas.pydata.org/pandas-docs/stable/user_guide/10min.html

Week 7:

- Data visualization basics
- Resource: Matplotlib tutorial: https://matplotlib.org/stable/tutorials/index.html

Week 8:

6-Month AI/ML Foundations Plan (Free Resources)

- Practice data manipulation with small project (Titanic or Iris dataset)

Month 3: Math Fundamentals for ML

Week 9:

- Linear algebra basics: vectors, matrices, multiplication
- Resource: 3Blue1Brown Essence of Linear Algebra (first 6 videos): https://www.youtube.com/playlist?list=PLZHQObOWTQDMsr9K-f6V9QcNw4EYOZiaL

Week 10:

- Linear algebra continued: eigenvalues, eigenvectors
- Resource: Khan Academy Linear Algebra: https://www.khanacademy.org/math/linear-algebra

Week 11:

- Calculus basics: derivatives, gradients
- Resource: Khan Academy Calculus 1 (derivatives sections): https://www.khanacademy.org/math/calculus-1

Week 12:

- Probability & statistics basics: distributions, mean, variance
- Resource: Khan Academy Statistics and Probability fundamentals: https://www.khanacademy.org/math/statistics-probability

Month 4: Intro to Machine Learning

Week 13:

- What is ML? Types, workflow
- Resource: Andrew Ng ML Course (Coursera, audit free) Week 1: https://www.coursera.org/learn/machine-learning

Week 14:

- Linear regression, gradient descent
- Resource: Andrew Ng ML Course Week 2

Week 15:

- Logistic regression, classification basics
- Resource: Andrew Ng ML Course Week 3

Week 16:

6-Month AI/ML Foundations Plan (Free Resources)

- Decision trees, overfitting, model evaluation
- Resource: Andrew Ng ML Course Week 4

Month 5: More ML Algorithms & Tools

Week 17:

- Support Vector Machines, KNN
- Resources: Andrew Ng ML Course Week 5 + Google ML Crash Course: https://developers.google.com/machine-learning/crash-course

Week 18:

- Clustering (K-Means) and Unsupervised learning
- Resources: Andrew Ng ML Course Week 6 + Google ML Crash Course

Week 19:

- Model evaluation metrics (accuracy, precision, recall)
- Resources: Andrew Ng ML Course Week 7 + practice with scikit-learn

Week 20:

- Hands-on with Scikit-learn: basic models
- Resources: Scikit-learn tutorials: https://scikit-learn.org/stable/tutorial/index.html + small classification project

Month 6: Mini Projects & Portfolio Building

Week 21:

- Titanic Dataset: Data cleaning, feature engineering
- Resources: Kaggle Titanic tutorial: https://www.kaggle.com/startupsci/titanic-data-science-solutions + practice data manipulation

Week 22:

- Titanic Dataset: Build and evaluate models
- Resources: Train logistic regression, decision trees using Scikit-learn

Week 23:

- MNIST Dataset: Image recognition intro
- Resources: Load dataset, build simple classifier with Scikit-learn: https://scikit-learn.org/stable/auto_examples/classification/plot_digits_classification.html

6-Month AI/ML Foundations Plan (Free Resources)

Week 24:

- Portfolio setup: Document projects on GitHub
- Resources: Create GitHub repos, write README, optional blog posts: https://guides.github.com/

Tips for Success:

- Practice daily (1 hour minimum)
- Keep notes of key concepts
- Join ML communities (Reddit, Kaggle)
- Ask questions frequently