

Artificial Intelligence Internship Module (6 Weeks)

Week 1: Introduction to AI & Python for AI (Beginner)

Objective: Understand AI fundamentals and basic Python programming for AI applications.

Tasks:

- Write a note (300 words) explaining **What is AI?**, types of AI, and its real-world applications.
- Install Python, Jupyter Notebook, and essential libraries (NumPy, Pandas, Matplotlib, Seaborn).
- Create a program to input student details and display results using if-else and loops.
- Create a simple chatbot using if-else conditions (rule-based bot).
- Write a Python program to perform basic math operations using functions.

Week 2: Search Algorithms in AI (Basic to Intermediate)

Objective: Learn and implement AI search techniques.

Tasks:

- Implement **Linear Search** and **Binary Search** in Python.
- Implement **Depth-First Search (DFS)** using a graph represented by an adjacency list.
- Implement **Breadth-First Search (BFS)** for the same graph structure.
- Solve the **8-puzzle problem** using DFS or BFS (concept only).
- Research and write a report explaining *A*, *Greedy Best-First Search**, and their real-life applications.

Week 3: Problem Solving & AI Concepts (Intermediate)

Objective: Work on AI problem-solving strategies.

Tasks:

- Solve the **Towers of Hanoi** problem using recursion in Python.
- Create a Python program to implement a simple **Tic-Tac-Toe** game (player vs player).
- Create a program for **N-Queens Problem** using backtracking.
- Write a Python program to generate **random mazes** and display them.
- Write a research note (200-300 words) on **Intelligent Agents** and their types

Week 4: Machine Learning Basics for AI (Intermediate to Advanced)

Objective: Learn basics of Machine Learning, a core AI branch.

Tasks:

- Install Scikit-Learn and load a dataset (e.g., Iris dataset).
- Perform data preprocessing: handling missing values and encoding categorical data.
- Implement **Linear Regression** on a dataset and visualize the result.
- Implement **K-Nearest Neighbors (KNN)** on the Iris dataset and evaluate accuracy.

- Implement **Decision Tree Classifier** and visualize it using Graphviz or Matplotlib.

Week 5: Neural Networks & Deep Learning (Advanced)

Objective: Get hands-on with neural networks using TensorFlow/Keras.

Tasks:

- Install TensorFlow and Keras. Build your first **Perceptron model** for binary classification.
- Implement a **Multi-Layer Perceptron (MLP)** for the MNIST handwritten digit dataset.
- Visualize model accuracy and loss graphs using Matplotlib.
- Perform hyperparameter tuning (change epochs, batch size, activation functions)
- Write a short blog/note explaining **how neural networks learn**.

Week 6: AI Project – Complete AI Application (Advanced)

Objective: Apply AI techniques in a real-world mini project.

Tasks:

- Select a problem: **Spam Email Detection / Face Mask Detection / Chatbot / Image Classification**.
- Collect dataset (Kaggle/Google Datasets/UCI Repository).
- Preprocess data and perform EDA.
- Build, train, and evaluate an AI/ML model using appropriate algorithms.
- Prepare a final report covering introduction, methodology, results, and conclusion. Submit code + report.



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