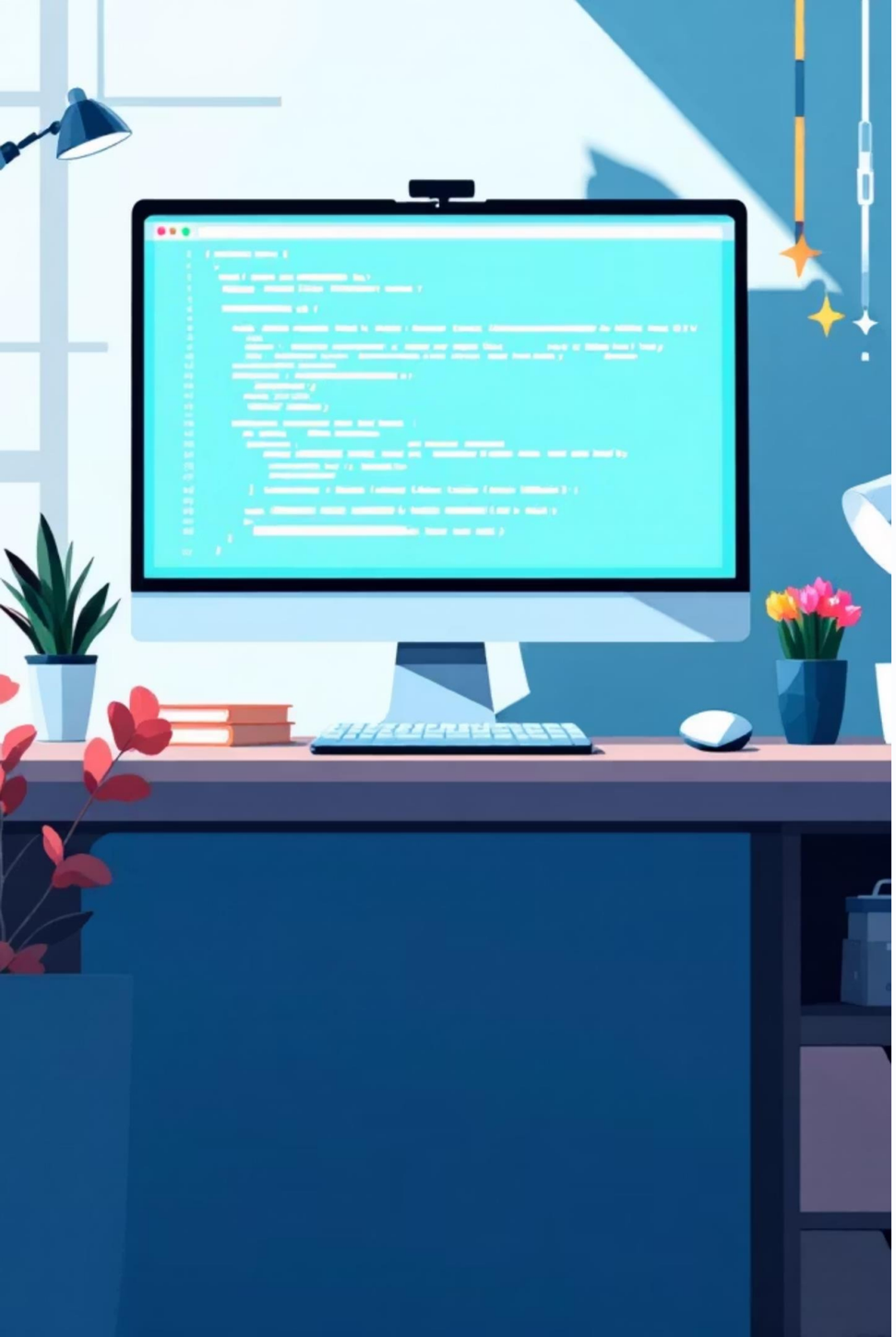
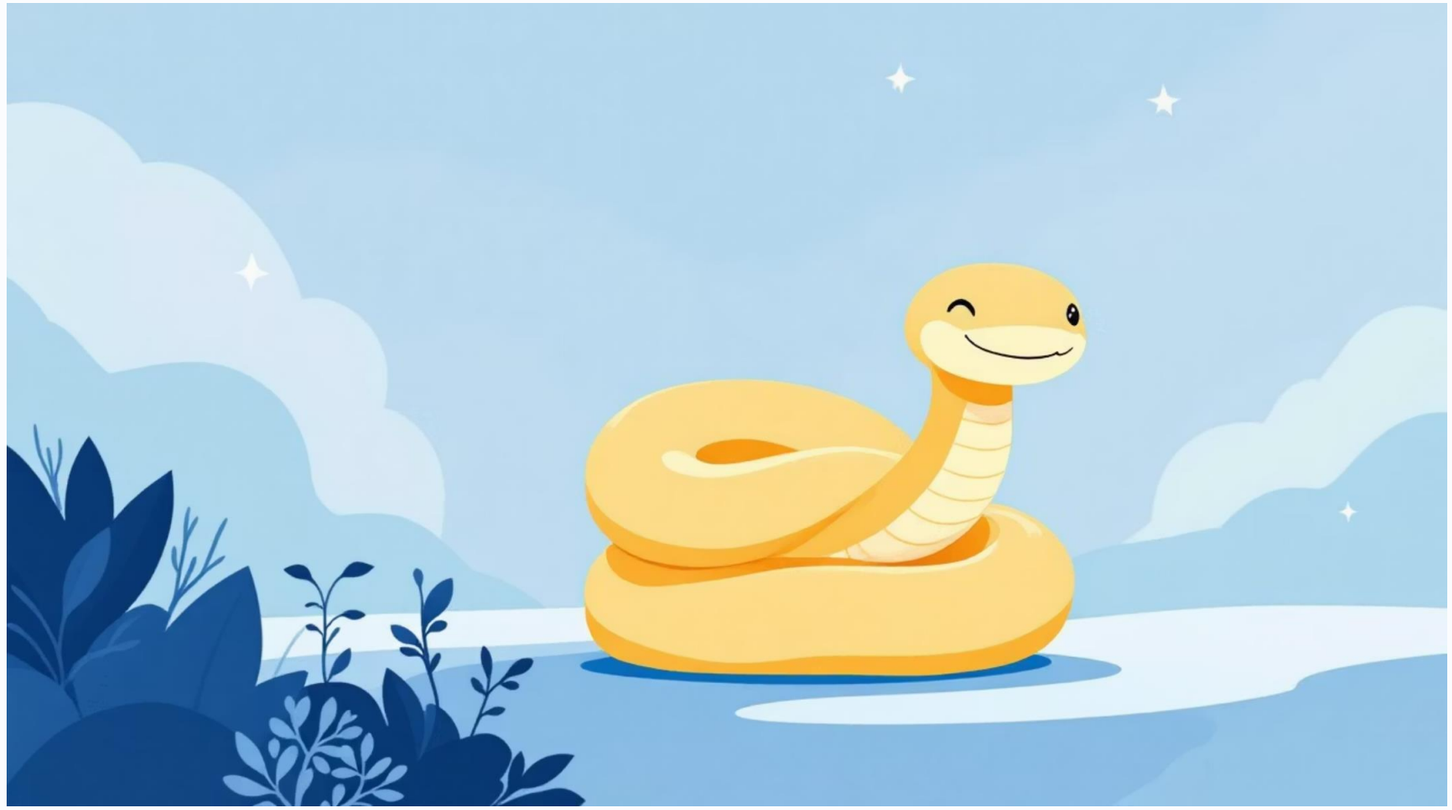


One Month Python & AI-Ml Internship Report

A comprehensive journey through Python programming, machine learning fundamentals, and practical model implementation

Python Foundation: Week 1



Core Language Skills

Mastered Python from foundational concepts to advanced programming paradigms, building a solid technical foundation for data science applications.

Basic Concepts

Variables, data types, operators, control flow, and functions

Data Structures

Lists, tuples, dictionaries, sets, and comprehensions

Advanced Topics

Object-oriented programming, error handling, and file operations

Essential Libraries: Week 2

Explored the core Python ecosystem for machine learning and deep learning applications

Pandas

Data manipulation and analysis with powerful DataFrame operations

NumPy

Numerical computing with efficient array operations and mathematical functions

Matplotlib

Creating static, animated, and interactive visualizations

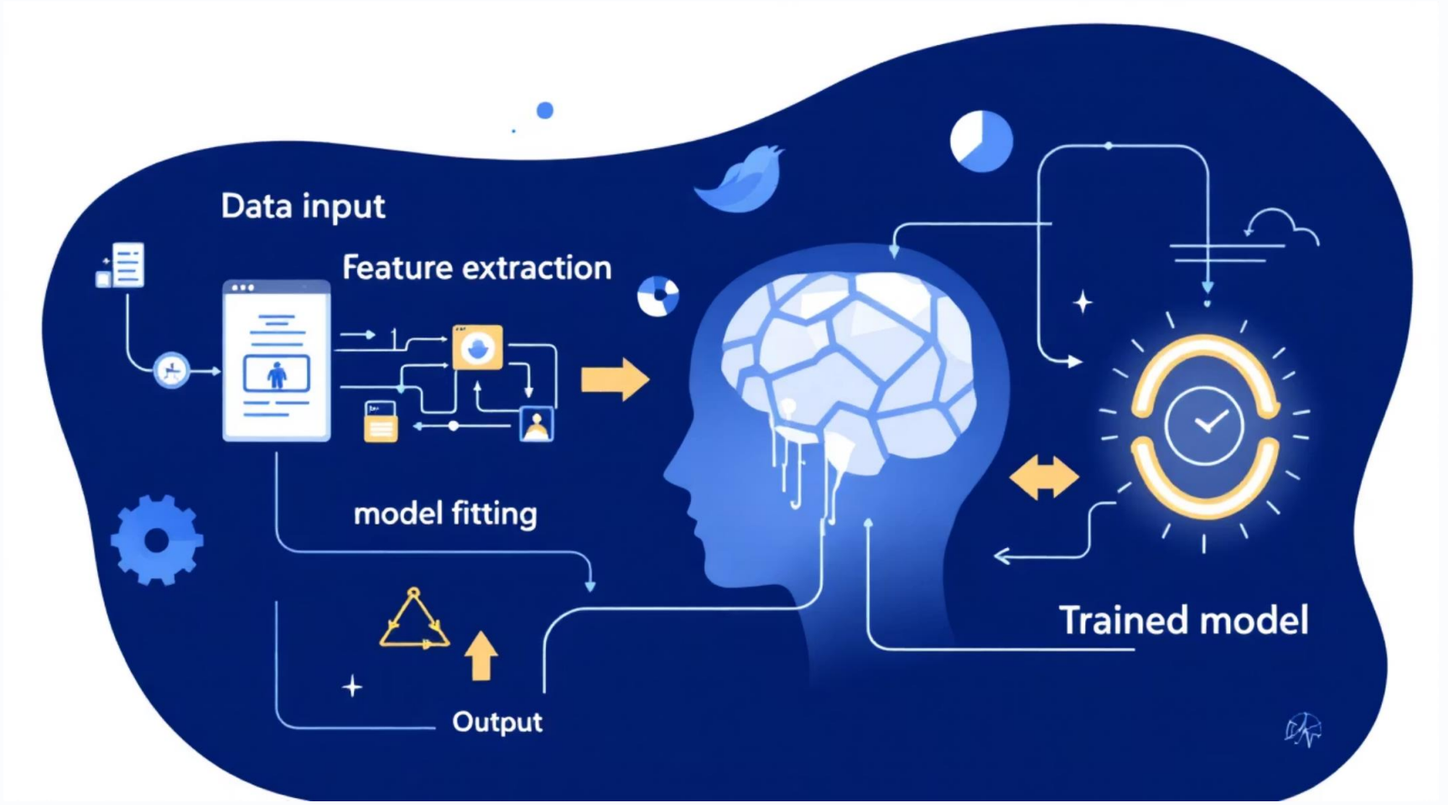
Seaborn

Statistical graphics with beautiful, informative visualizations

Machine Learning Fundamentals: Week 3

Core Concepts Mastered

- Supervised, unsupervised, and reinforcement learning
- Training, validation, and test dataset splits
- Bias-variance tradeoff and model complexity
- Cross-validation techniques



Model Evaluation

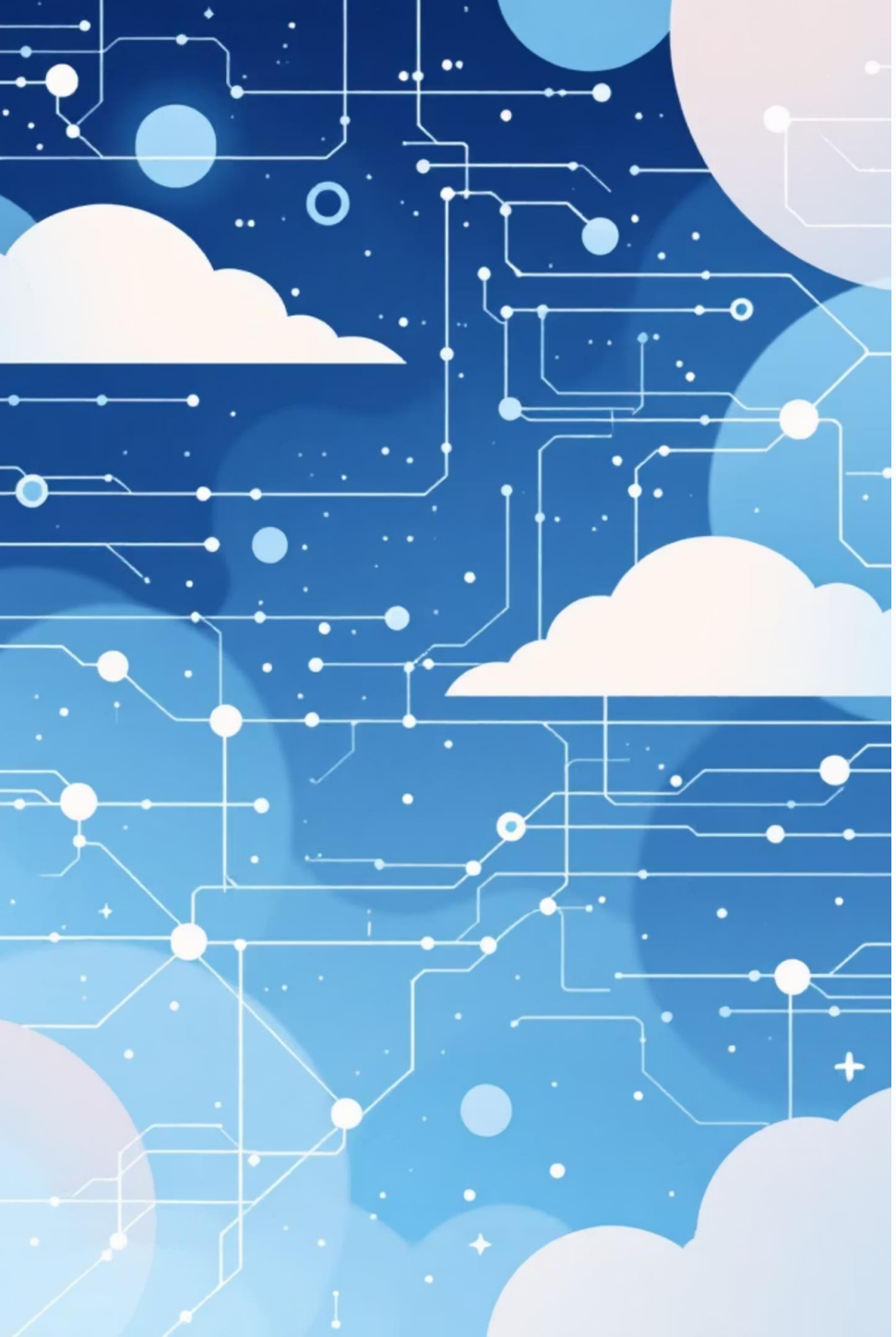
Accuracy, precision, recall, F1-score, and ROC-AUC metrics

Problem Types

Classification and regression fundamentals

Overfitting Analysis

Visualizations and manual train-test split implementation



Classification & Regression: Week 4

Classification

Logistic Regression, KNN, SVM, Naive Bayes, and tree-based ensemble methods

Regression

Linear, Polynomial, Ridge, Lasso, and boosting models

Applications

Spam detection, disease prediction, churn analysis, MNIST classification

Hands-On Projects

Classification Projects

- Spam detection system
- Disease prediction model
- Customer churn prediction
- MNIST image classification

Regression Projects

- House price prediction
- Salary forecasting
- Feature engineering
- Model comparison

Key Skills: Imbalanced data handling, confusion matrix analysis, outlier detection, and comprehensive model evaluation