

# INTRODUCTION TO MACHINE LEARNING

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# DEFINITION OF MACHINE LEARNING

- EXPLANATION OF MACHINE LEARNING AND ITS SIGNIFICANCE IN TODAY'S TECH LANDSCAPE.
- DIFFERENTIATING BETWEEN TRADITIONAL PROGRAMMING AND MACHINE LEARNING APPROACHES.

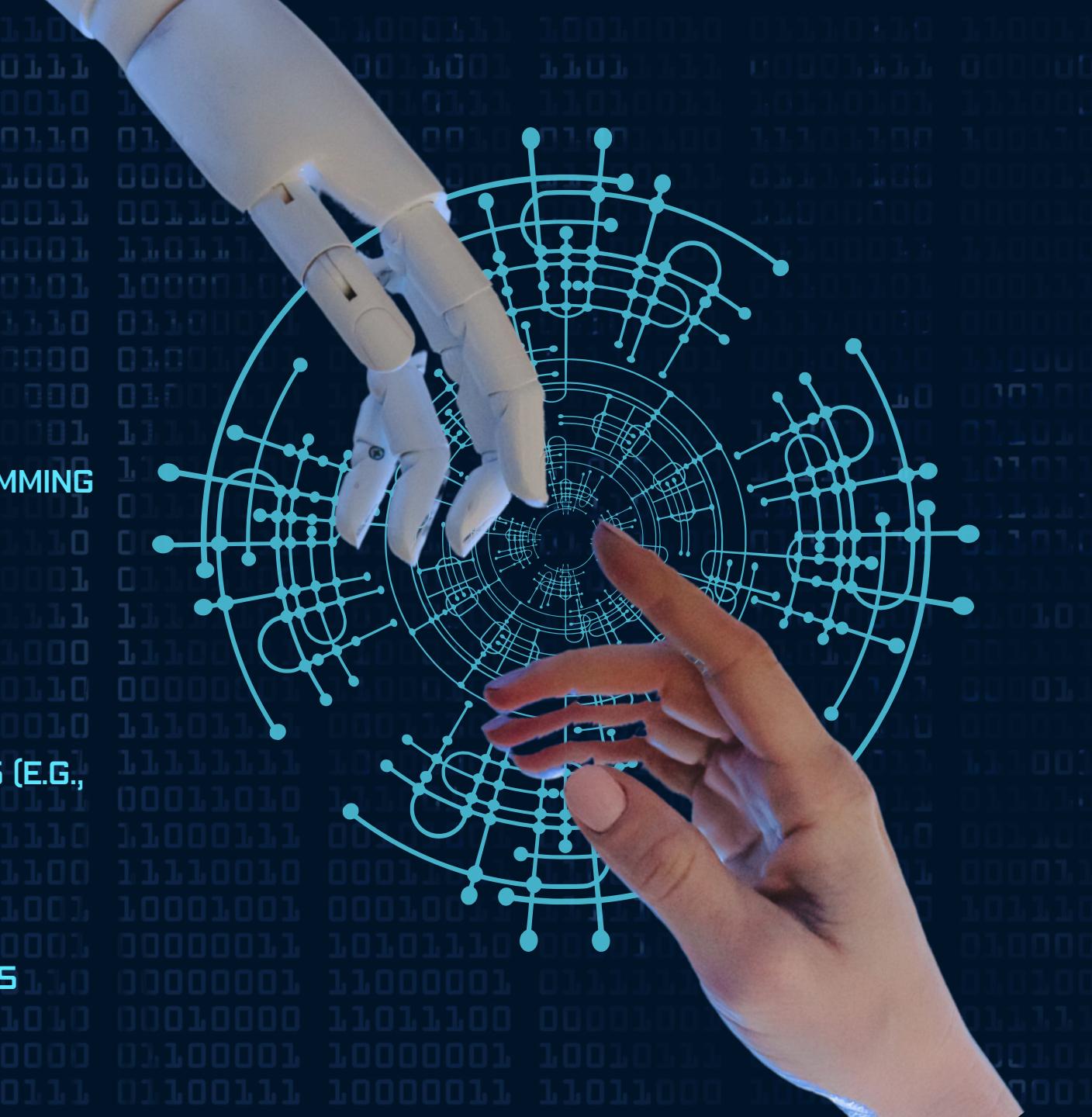
## TYPES

### TYPES AND APPLICATIONS

- OVERVIEW OF SUPERVISED, UNSUPERVISED, AND REINFORCEMENT LEARNING.
- REAL-WORLD APPLICATIONS ACROSS INDUSTRIES (E.G., HEALTHCARE, FINANCE, MARKETING).

### MAIN TASKS

- INTRODUCTION TO CLASSIFICATION, REGRESSION, CLUSTERING, AND REINFORCEMENT LEARNING.
- UNDERSTANDING THE GOALS AND METHODOLOGIES BEHIND EACH TASK.



# BASIC MACHINE LEARNING ALGORITHMS

Linear Regression

Logistic Regression

Decision Trees

K-Nearest Neighbors  
(KNN)

Clustering



# Practical Application of Machine Learning

## Implementation with Python and Libraries

- Setting up Python environment for machine learning.
- Hands-on coding using scikit-learn, TensorFlow, and PyTorch.
- Walkthroughs of example datasets and projects.

## Interactive Exercises

- Coding challenges to reinforce understanding.
- Collaborative projects to encourage engagement and teamwork.

# Evaluation and Interpretation of Results

## Model Evaluation Metrics

- Accuracy, precision, recall, F1 score, ROC curve, and AUC.
- Choosing appropriate metrics based on the problem domain.

## Interpreting Results

- Visualizing model performance and errors.
- Identifying biases and limitations of machine learning models.

## Practical Benefits

- Discussing the real-world impact of machine learning applications.
- Ethical considerations and responsible AI practices.

# *Application of Modern Teaching Methods:*

- Implement active learning strategies such as problem-based learning or flipped classroom approaches.
- Incorporate peer assessment and self-assessment activities to promote reflection and critical thinking.
- Utilize adaptive learning technologies to personalize the learning experience based on each learner's progress and preferences.

