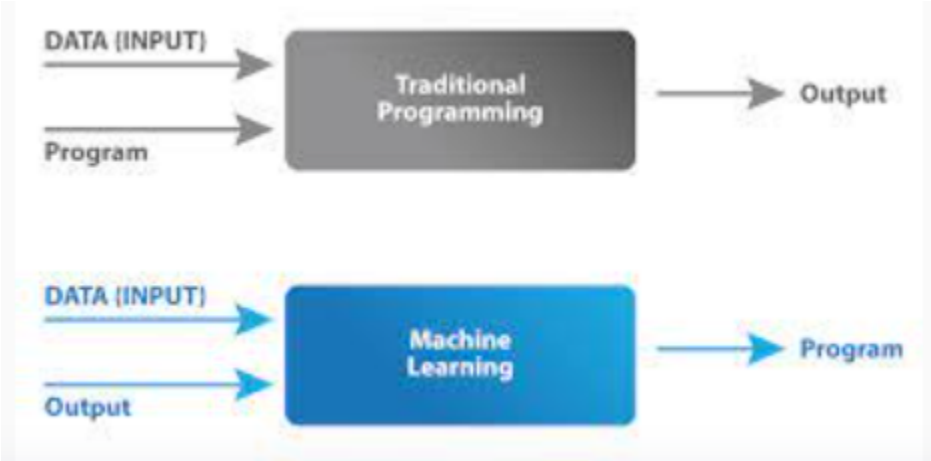
MACHINE LEARNING:

A subset of artificial intelligence where the machines can programme by their own with less human intervention.They are trained to behave and think like humans.



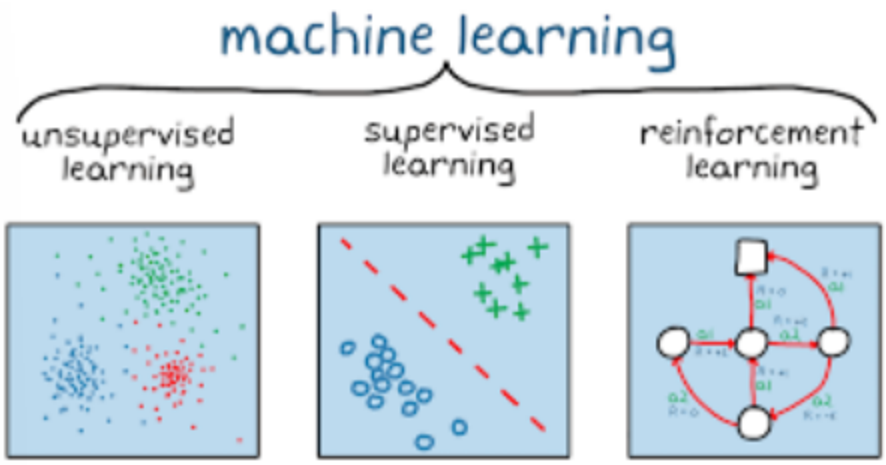
<u>TYPES OF MACHINE LEARNING</u>

SUPERVISED LEARNING:
Deals with the labelled datas - - >matches the correct input to the correct output
Used in classification , sentiment analysis

UNSUPERVISED LEARNING:
Deals with the unlabelled datas - -> find hidden patterns or groupings.

REINFORCEMENT LEARNING:
Deals with the goals based data,automatically determine the ideal behaviour using the feedback signal called reinforcement signal

Agent: The decision-maker (e.g., a robot).
Environment: The external system the agent interacts with.
Action (A): Choices the agent can make.
State (S): The agent's current situation.
Reward (R): Feedback for an action (positive or negative).
Policy (π): The strategy for choosing actions.



QUIZ 1

1 **What is the primary goal of machine learning?**

The primary goal of machine learning is to create machines that can perform only a single task.

The primary goal of machine learning is to enable computers to learn from data and improve their performance on specific tasks over time.

The primary goal of machine learning is to replace human decision-making entirely.

SubmittedCorrect!

2 **What is the difference between supervised and unsupervised learning?**

Supervised learning and unsupervised learning are interchangeable terms with no distinct differences.

Unsupervised learning analyzes unlabeled data to discover patterns or relationships without explicit output labels.

Supervised learning only uses unlabeled data and does not require any correct answers during training.

Supervised learning involves training models on labeled data, where the correct answers are provided, and the model learns to map input data to output labels.

SubmittedCorrect!

3 **Select two examples of applications for machine learning in real-world scenarios.**

Machine learning is applied in healthcare for disease prediction and diagnosis, using patient data to identify potential health issues.

Machine learning is only used in theoretical research and does not have practical applications in real-world scenarios.

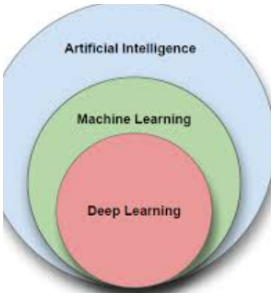
In marketing, machine learning is utilized for customer segmentation, allowing businesses to target specific groups with personalized advertisements.

Machine learning is exclusively used in robotics

SubmittedCorrect!

ARTIFICIAL INTELLIGENCE

A computer controlling another computer to do tasks that are actually done by the humans. It has 2 subclass namely machine learning and neural networks



What's the connection between AI and ML?

Although AI and ML aren't synonymous, they share a close relationship. To simplify their correlation:

- AI encompasses the broader idea of enabling machines to emulate human-like abilities, such as sensing, reasoning, acting, or adapting.
- ML operates within the realm of AI, focusing on using data to autonomously extract knowledge and learn.

Quiz

1

Artificial Intelligence is _____

a branch of computer science that constitutes underlying technology that enables computers to simulate human intelligence

SubmittedCorrect!

Report issue

2

Which of the following statements about machine learning is TRUE?

Machine learning is the intelligence technology that provides computers with advanced abilities to execute processes without being specifically programmed to do so

SubmittedCorrect!

Report issue

3

True or False: The late 1980s marked a resurgence in the development of artificial intelligence (AI), driven by advancements in areas like chess and computer vision.

True

SubmittedCorrect!

PIPELINES OF MACHINE LEARNING:

Data preprocessing is converting the raw data to usable data

Data errors are of three types : missing data , noisy data and inconsistent data

Machine learning workflow:

Gathering data

Data preprocessing

Choosing the model as per the obtained data set

Training the model

Evaluation - a crucial step which checks whether the model satisfies the required needs

QUIZ

1 Why is data gathering a critical first step in the machine learning workflow?

Data gathering is an optional step in the machine learning workflow and doesn't significantly impact the model's performance.

Models can learn effectively without a representative dataset.

Data gathering provides the foundation for testing models only, ensuring they are representative of real-world scenarios.

Data gathering provides the foundation for training and testing models, ensuring they are representative of real-world scenarios.

2 **What is the purpose of the training and testing phases in the workflow?**

The purpose of the training and testing phases in the workflow is to ensure that the model can learn patterns from the data and memorize the learned patterns.

The training and testing phases in the workflow are irrelevant and can be skipped since models inherently understand all types of data without any need for learning or evaluation.

The purpose of the training and testing phases in the workflow is to ensure that the model can learn patterns from the data and generalize its knowledge to make accurate predictions on new, unseen data.

SubmittedCorrect!

Report issue

3 **Why is model evaluation crucial in the machine learning workflow?**

Model evaluation measures the performance of the model and ensures its effectiveness on new, unseen data.

Model evaluation is unnecessary as machine learning models always perform perfectly.

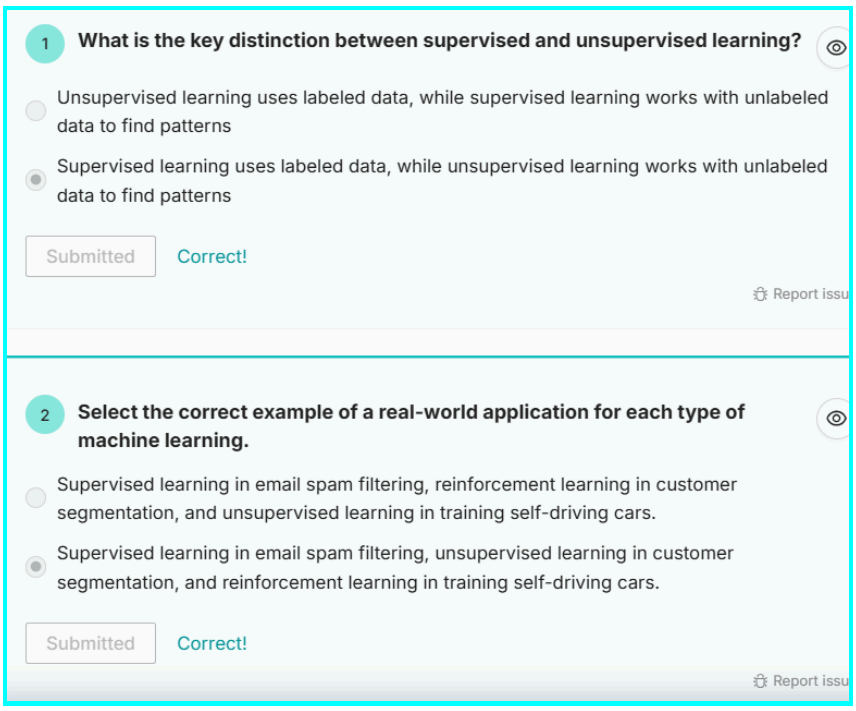
Model evaluation provides a way to quickly complete the machine learning project.

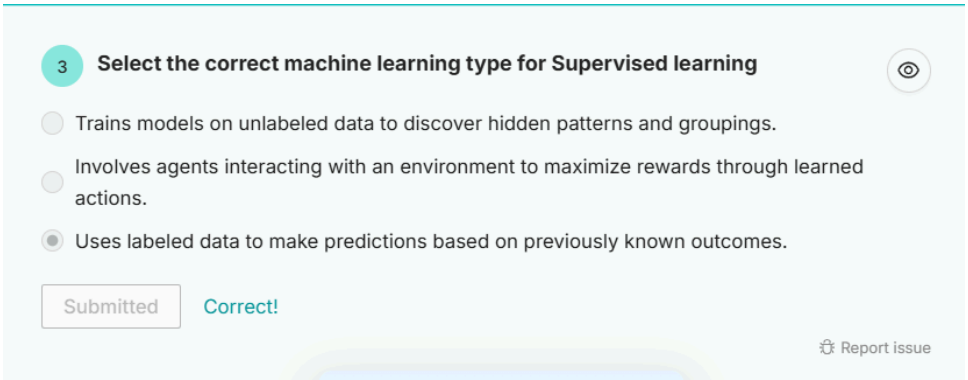
SubmittedCorrect!

Report issue

TYPES OF MACHINE LEARNING

	Supervised Learning	Unsupervised Learning	Reinforcement Learning
Definition	Makes predictions from data	Segments and groups data	Reward-punishment system and interactive environment
Types of Data	Labeled data	Unlabeled data	Acts according to a policy with a final goal to reach (No or predefined data)
Commercial Value	High commercial and business value	Medium commercial and business value	Little commercial use yet
Types of Problems	Regression and classification	Association and Clustering	Exploitation or Exploration
Supervision	Extra supervision	No	No supervision
Algorithms	Linear Regression, Logistic Regression, SVM, KNN, and so forth	K – Means clustering, C – Means, Apriori	Q – Learning, SARSA
Aim	Calculate outcomes	Discover underlying patterns	Learn a series of actions
Application	Risk Evaluation, Forecast Sales	Recommendation System, Anomaly Detection	Self-Driving Cars, Gaming, Healthcare



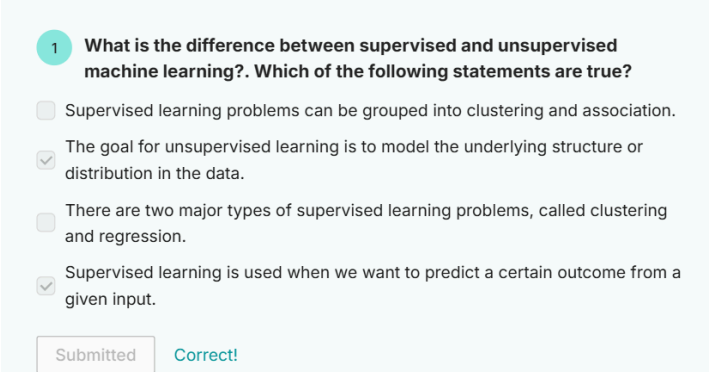


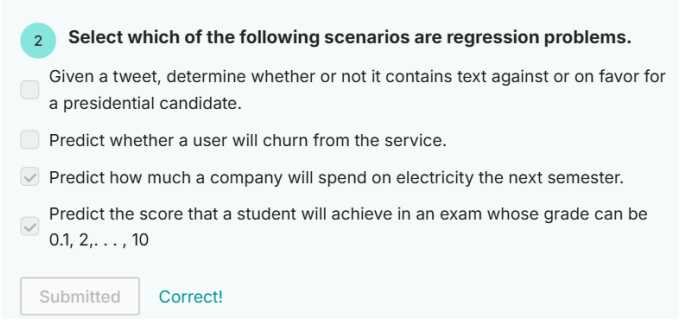
Types of Supervised Learning

Supervised learning can be further classified into two problems which are:

- Classification is a process in which new observations are recognized and separated to categorize them.
- Regression is used to understand the relationship between dependable and independent variables.

QUIZES





3 **Select which of the following scenarios are classification problems.**

- [ ] Impact of blood alcohol content on coordination
- [x] Determine whether a customer is likely to purchase more items or not
- [ ] Predict the prices of a house in Boston based on zipcode, neighbourhood, the per capita crime rate by town, etc
- [x] An algorithm is trained to recognize spam email by learning the characteristics of what constitutes spam vs non-spam email.

Submitted Correct!

4 **Suppose you want to develop a supervised machine learning model to predict whether a superhero will fly or not. Which of the following statements are true?**

- ( ) A regression model is the best way to predict the probability to fly.
- ( ) This is not a machine learning problem
- (•) A classification model provide the best approach.
- ( ) We'll use unlabeled examples to train the model.

Submitted Correct!