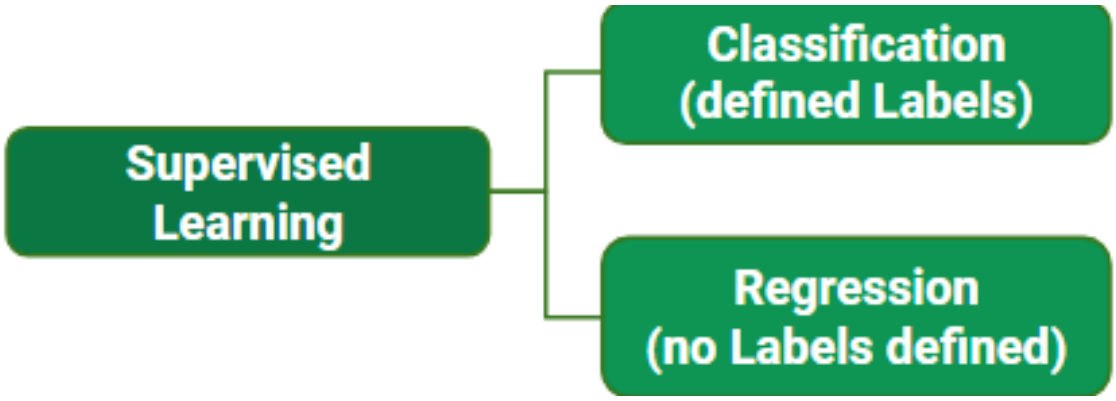
Cost function formula:

$$\text{Cost Function (J)} = \frac{1}{n}\sum_{i=0}^{n}(h_\theta(x^i) - y^i)^2$$



1. Regression: Regression focuses on predicting continuous numeric values.

2. Classification: Classification is used when the goal is to predict categorical labels or classes.

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terminology

Training set: The dataset used to teach a machine learning algorithm or model. It contains both input features and their corresponding target labels.

Machine learning
"Field of study that gives computers the ability to learn without being explicitly programmed."

Machine learning algorithms:
-Supervised learning
-Unsupervised learning

Supervised learning

Learns from being given "right answers"

Regression
Predict a number
infinitely many possible outputs

Classification
predict categories
small number of possible outputs

Unsupervised learning

Data only comes with inputs x, but not output labels y.
Algorithm has to find structure in the data.

Clustering
Group similar data points together.

Dimensionality reduction
Compress data using fewer numbers.

Anomaly detection
Find unusual data points.

Linear regression model

$$f_{w,b}(x) = wx + b$$

Cost function

$$J(w,b) = \frac{1}{2m}\sum_{i=1}^{m}(f_{w,b}(x^{(i)}) - y^{(i)})^2$$

Gradient descent algorithm

repeat until convergence {

$$w = w - \alpha\frac{\partial}{\partial w}J(w,b) \rightarrow \frac{1}{m}\sum_{i=1}^{m}(f_{w,b}(x^{(i)}) - y^{(i)})x^{(i)}$$

$$b = b - \alpha\frac{\partial}{\partial b}J(w,b) \rightarrow \frac{1}{m}\sum_{i=1}^{m}(f_{w,b}(x^{(i)}) - y^{(i)})$$

}