Neural Network

Multi-layer perceptron:

Types: Based on Complexity of the Task

Type of MLP	Characteristics	Typical Use Cases
Basic MLPs	Simpler tasks, fewer layers and neurons	Straightforward applications like basic classification, entry-level neural network projects
Complex MLPs	Designed for complex tasks, many layers and neurons or specialized architectures	Advanced applications in AI like high-dimensional data analysis, complex pattern recognition, large scale deep learning

Neural Network

Multi-layer perceptron:

Types:

Based on Adaptation Mechanism

Type of MLP	Characteristics	Typical Use Cases
Static MLPs	Constant architecture and neuron parameters after training	Tasks with consistent data patterns where adaptability is less crucial
Dynamic MLPs	Can adapt structure and neuron parameters based on input data or learning task	Environments with changing data patterns or tasks requiring ongoing learning

Neural Network

Multi-layer perceptron:

Types:

Based on Output Layer Function

Type of MLP	Characteristics	Typical Use Cases
Softmax MLPs	Softmax function in the output layer for categorical probability distributions	Multi-class classification problems such as digit recognition, text classification
Linear Output MLPs	Linear activation function in the output layer	Regression tasks where the output is continuous

Neural Network

Multi-layer perceptron:

Types:

Based on Network Topology

Type of MLP	Characteristics	Typical Use Cases
Feedforward MLPs	Standard form, no cycles in connections	Most common use cases of neural networks, including both classification and regression
Recurrent Neural Networks	Loops in connections, allowing information persistence	Time series analysis, sequential data processing, language modeling, speech recognition

Neural Network

Multi-layer perceptron:

Types:

Based on Activation Functions

Type of MLP	Characteristics	Typical Use Cases
Sigmoid MLPs	Use sigmoid functions in hidden layers	Early neural network applications, binary classification tasks (less common now due to vanishing gradient issues)
ReLU MLPs	Utilize Rectified Linear Unit (ReLU) activation function	Modern deep learning tasks, including complex neural networks used in various fields

Neural Network

Multi-layer perceptron:

Types:

Based on Task

Type of MLP	Characteristics	Typical Use Cases
Classification MLPs	Output a discrete label or class	Image classification, text categorization, medical diagnosis
Regression MLPs	Predict a continuous output	Real estate pricing, stock market forecasting, temperature prediction

Neural Network

Multi-layer perceptron:

Types:

Based on Number of Hidden Layers

Type of MLP	Characteristics	Typical Use Cases
Shallow Neural Networks	One hidden layer	Basic pattern recognition, simple classification and regression tasks
Deep Neural Networks	Multiple hidden layers	Complex pattern recognition, image and speech recognition, natural language processing