INGLÉS TÉCNICO IV
2° 2° Cuatrimestre

CENTRO POLITÉCNICO SUPERIOR MALVINAS ARGENTINAS

Neural Networks

Topic

Artificial Neural Networks: What they are, how they work, and why they matter

WebPages

- *Artificial Neural Network: What they are & why they matter*
- *Importance of Artificial Neural Networks in Artificial Intelligence*

Objective

Read both texts and complete the activities to understand:

- what neural networks are
- how they work
- where they are used
- why they are important in AI

Artificial Neural Network: What they are & why they matter

Activity 1 – Multiple Choice

Choose the correct answer.

1. Neural networks are systems with interconnected
   a) screens
   b) nodes
   c) files
2. Neural networks can recognize hidden
   a) patterns

LIVEWORKSHEETS

b) chairs
c) walls

3. The first neural network was conceived in
   a) 1975
   b) 1943
   c) 2022
4. Deep learning systems are neural networks with
   a) many layers
   b) no data
   c) no output
5. CNNs are commonly used for
   a) image classification
   b) cooking
   c) cleaning
6. RNNs are useful for
   a) image colors only
   b) sequential information
   c) maps only
7. One area where neural networks help is
   a) fraud detection
   b) bicycle repair only
   c) sleeping
8. Feedforward neural networks have
   a) many feedback loops
   b) no feedback loops
   c) no hidden layers

Activity 2 – Match the Term with the Definition

Match the concepts.

Terms

1. CNN
2. RNN
3. Autoencoder
4. Hidden layer
5. Output layer

LIVEWORKSHEETS

6. Feedforward neural network

Definitions

a. A layer where the final result appears

b. A type of network used for sequential data

c. A type of network often used for image tasks

d. A network that models the inputs themselves

e. A network with no feedback loops

f. A layer where processing happens between input and output

Activity 3 – Fill in the Blanks

Complete the sentences with these words:

Words: brain, data, input, output, patterns, layers

1. Neural networks work in a way similar to the human _____.
2. They can recognize hidden _____ in raw data.
3. Deep learning systems have many _____.
4. The _____ layer receives the information first.
5. The final answer appears in the _____ layer.
6. Neural networks process large amounts of _____.

Activity 4 – Put the Information in Order

Number the events from **1 to 4** in the correct chronological order.

LIVEWORKSHEETS

___ Deep learning systems became more important with big data.

___ Warren McCulloch and Walter Pitts conceived the first neural network.

___ Neural networks began to support tasks like speech recognition and medical diagnosis.

___ Kunihiko Fukushima developed the first multilayered neural network.

Activity 5 – Short Answer

Answer in 1–2 complete sentences.

1. Why are neural networks important in real-life situations?

   _____

   _____

2. What is one difference between CNNs and RNNs?

   _____

   _____

3. Mention two industries that use neural networks.

   _____

   _____

4. What happens when neural networks have many hidden layers?

   _____

   _____

LIVEWORKSHEETS

Importance of Artificial Neural Networks in Artificial Intelligence

Activity 6 – True or False

Write **True** or **False**.

1. Artificial neural networks are part of artificial intelligence.
2. ANNs try to replicate the way humans learn.
3. The hidden layers keep all redundant information.
4. Facial recognition can improve company security.
5. Neural networks can improve over time based on user behavior.
6. Weights are important because they help neural networks learn.
7. Feed-forward networks pass data in one direction.
8. CNNs are mainly used for image data.
9. ANN decisions are always easy to explain.
10. Neural networks may require strong processors.

Activity 7 – Label the System

Match each part to its function.

Parts

1. Input layer
2. Hidden layer
3. Output layer
4. Weights
5. Activation function
6. Threshold

LIVEWORKSHEETS

Functions

a. helps decide if the neuron activates

b. shows the final result

c. receives raw data

d. helps measure the importance of a signal

e. transforms the value before passing it on

f. extracts the most important information

Activity 8 – Sort the Ideas

Put the items into the correct category.

- fault tolerance
- black box
- needs powerful processors
- can work with inadequate data
- stores information across the network
- difficult to explain results

Advantages of ANN	Disadvantages of ANN

LIVEWORKSHEETS

Activity 9 – Complete the Process

Put these steps in the correct order from **1 to 5**.

___ Hidden layers process the information.

___ The output layer gives the final result.

___ The activation function decides if the neuron fires.

___ Raw data enters the input layer.

___ Weighted sums and bias are calculated.

Activity 10 – Choose the Correct Option

Choose the correct option.

1. In the text, neural networks can be used for **fraud detection / baking bread**.
2. In the music example, the system learns from **user behavior / random guessing**.
3. RNNs are useful for **sequential data / wall painting**.
4. CNNs extract features from **images / shoes**.
5. A major disadvantage of ANN is that it is a **black box / simple calculator**.
6. ANN may need **parallel processing power / no electricity**.

LIVEWORKSHEETS