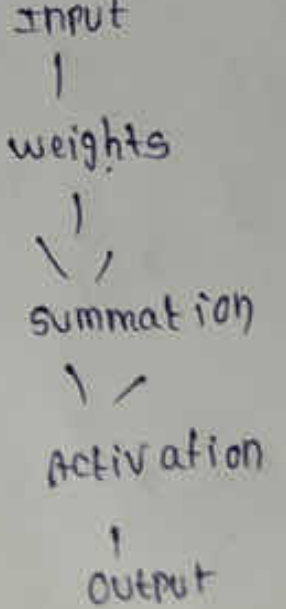
(1) A two layer feed forward neutral network

Let's create a simple two-layer feed forward neural network with a single perceptron in each layer.

→ The architecture will look like this:

Input layer	Hidden layer	output layer
	H_1	O_1
x_1	H_2	O_2
x_2	H_3	O_3
x_3	..	
..		

Here, x_1, x_2, x_3, etc represent the input features. H_1, H_2, H_3 etc. represent the hidden layer neurons, and O_1 represents the output neuron.



Input : $x_1, x_2, x_3, \ldots$ (Input features or output from the previous layer)

weights : $w_1, w_2, w_3 \ldots$ (Weights associated with each input)

summation : $sum = x_1 \cdot w_1 + x_2 \cdot w_2 + x_3 \cdot w_3 + \ldots$

Activation function : output = Activation(sum)

The activation function is typically a non-linear function, such as the sigmoid function or the rectified linear unit (ReLU)

3 (a) percepts for the Agent:

Image and data from instruments : The primary percepts for the mars rovers come from the various instrumental data about the martian environment

(b) characterize the operating environment:

martian surface: The rover needs to navigate and explore this environment, considering factor like slopes, rock and sand dunes.

Climate conditions:- The rover must adapt to the martian climate, which includes temperature variations and the occasional dust storms

(c) Actions the Agent can take:

movement:- Rovers can move around on the martian surface using wheels or tracks.

Instrument operation and communication

(d) Performance Evaluation:

Data collection success: The success of the rover can be evaluated based on its ability to collect and transmit valuable data.

Instrument operation: The efficiency and accuracy of the scientific instruments in Analysing samples.

(e) Agent Architecture:

- Deliberative Architecture.
- Reactive components.
- Learning components.