**Weights**

* Weights are values that determine the strength of the connections between neurons in the network. During training, weights are adjusted to map input features to the desired output.

**Biases**

* Each neuron has a bias, which is an offset that allows the neuron to activate even when the weighted sum of its inputs is zero. Biases provide flexibility, enhance representation capabilities, and improve learning efficiency.

**Learning Rate**

* The learning rate controls how much the model's parameters (weights and biases) are adjusted during each iteration of the training process. Choosing the right learning rate is critical for successful training.

**Forward Propagation**

* Forward propagation is the process of passing the input data through the neural network to get the output. The output of one layer becomes the input to the next layer.

**Sigmoid Function**

* The sigmoid function is a mathematical function with an "S"-shaped curve, used as an activation function in neural networks to introduce non-linearity. The output of the sigmoid function is always between 0 and 1, making it useful for representing probabilities.

**Backpropagation**

* Backpropagation is the algorithm used to train neural networks. It calculates how much each weight and bias contributes to the overall error and updates those parameters to improve the network's accuracy.

**Sigmoid Derivative**

* The sigmoid derivative plays a crucial role in the backpropagation algorithm. It tells us how much the output of the sigmoid function changes with respect to a small change in its input.

**Gradient Descent Update Formula**

* The gradient descent update formula represents the gradient descent update rule. It describes how the parameters (weights and biases) are adjusted based on the gradient of the error function.

**Input Data (x)**

* The input data (x) contains the features that the neural network will use to learn and make predictions. Each row in x represents a different sample or data point, and each column represents a different feature.

**Target Output (y)**

* The target output (y) contains the corresponding target output or labels for each sample in x. These labels represent the desired outcome or prediction that the neural network should learn to produce.

**Training the Neural Network**

* The purpose of x and y is to train the neural network to learn a mapping between the input features and the target output.

**Prediction**

* After training, the neural network can be used to predict the output for new input data.

**CPUs, T4 GPUs, and TPU v2-8s**

* These are different types of processors with varying strengths and weaknesses. CPUs are general-purpose processors, T4 GPUs are parallel processors well-suited for deep learning, and TPU v2-8s are custom-designed processors specifically for machine learning and AI workloads.