Backpropagation:

> It is an effective Algorithm used to train ANN, especially in feed-forward neural networks.

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static backpropagation:

> It is a network designed to map static I/P for static O/P.

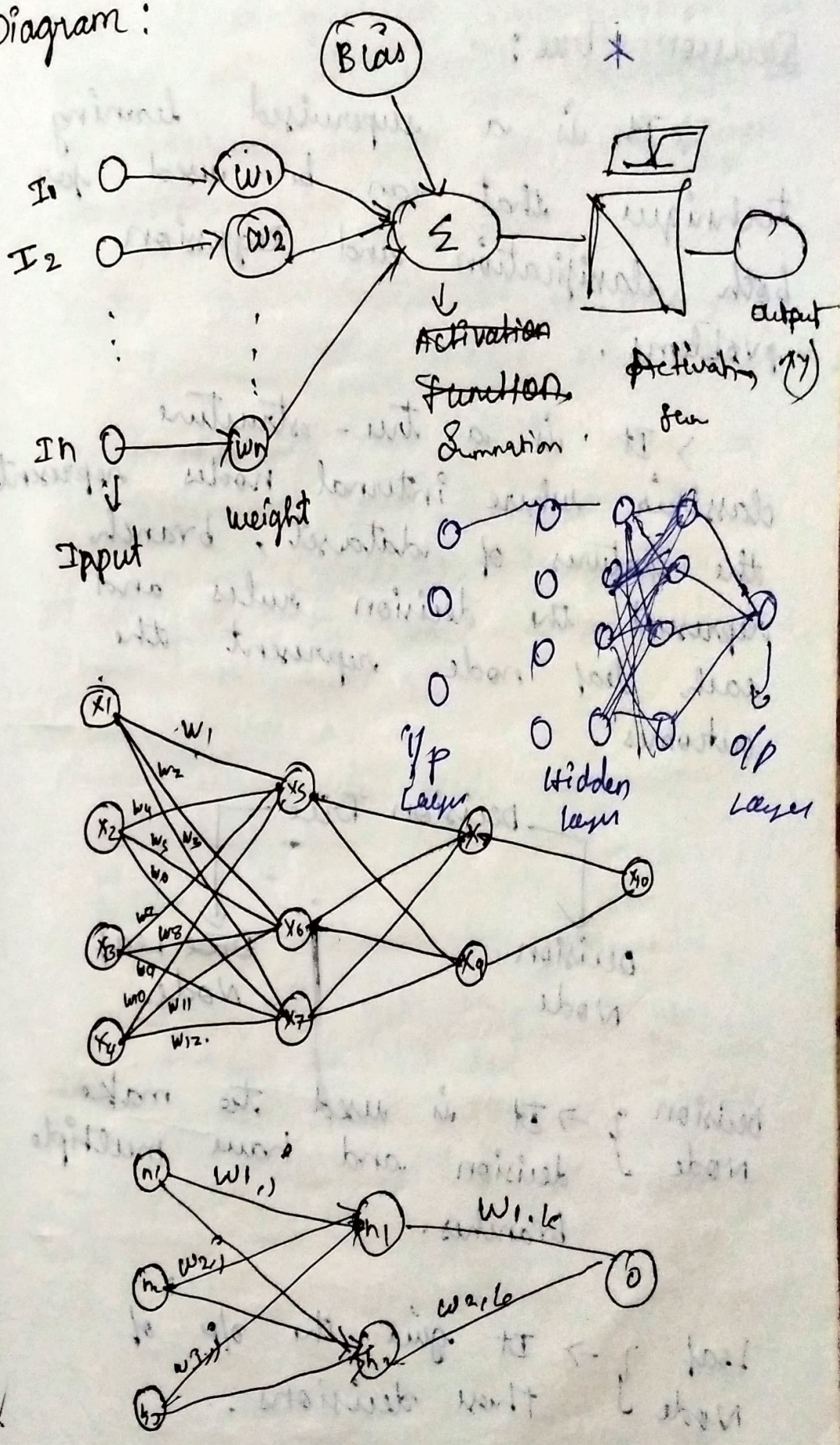
> These types of network are capable of solving static classification problem such as OCR (Optical Characters Recognition).

Recurrent back-propagation:

> It is a training Algorithm used for Recurrent Neural Networks. (RNN).

> It is good at handling sequential data, such as time series or Natural Language.

Diagram:


Bias
I1
I2
In
W1
W2
Wn
Σ
Activation Function
Summation
Activation fun
output (y)
Input
weight
I/p Layer
Hidden layer
O/p Layer

Algorithm:

1. Input x, arrive through the preconnected path.

2. Then, weights W are randomly selected, then the i/p is modeled using the weight.

3. Calculate the o/p of each neuron from the i/p layer to the hidden layer to the o/p layer.

4. Calculate the error in o/p.

$$\text{Error}_B = \text{Actual o/p} - \text{Desired o/p}.$$

5. The errors are sent back to the hidden layer from the o/p layer for adjusting the weights to less the error.

6. Repeat the process until the desired o/p is achieved.

Advantage:

* Efficient Learning
* Accuracy.
* Flexibility

Disadvantage:

* computational cost
* Local minima
* Requires large Dataset
* slow convergence.