Vikaan Highlight 1:
- Digital Computer → Biological computer
- Switzerland based startup.

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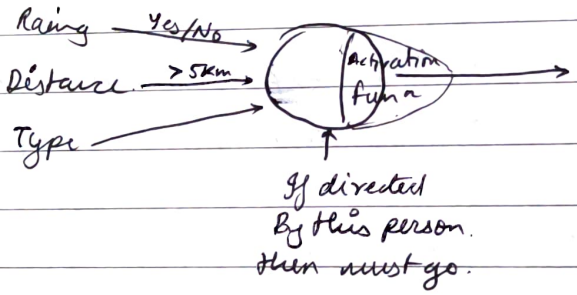
* Artificial Neuron

- Input
- Weights - [Assigned Randomly at start] - Which input has more significance.
- Weighted sum - Multiplication of input & weights & then added up.
- Activation function - Finding pattern [Non Linear] (ADAM)
- Bias - Based on one condition.
  - Movie wala example.



- Feed forward network : Output of one layer is given to next layer

* Back Propogation

- Based on the ~~out~~ test data set, it changes the weights so that the loss is minimized.

Gradient Descent

- Step by step process of reaching the global loss minima

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* Learning Rate

- The rate at which global minima can be reached.
- Rate vs. Loss.
  - Fast Rate may not guarantee to find the global minima.
  - Low Rate : • Might find the ~~local~~ global minima
    • Can get stuck at local minima.

* Adaptive learning Rate : To overcome the limitations of ↑

Slope <<<0 ⟶ The steps taken are larger.
Slope < 0 ⟶ The steps are comparitively smaller
~~Slope~~

Step Size = Slope × Learning Rate.

~~Step Size~~ • SGD
• ADAM
• Alda Delta.

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* Tensorflow

Tensor : Multidimensional vector [> 2 dimention are a tensor]

- tf. one (3) → 1 One matrix
- tf. zero (3) → Zero "
- tf. eye (2). → Identity "
- tf. range (start = 1, limit = 10, delta = 2)

tensor can be made.

- Random values based on mean & std. diviation.

- tf. cast → Type casting.
- tf. add
- tf. subtract
- tf. divide
- tf. multiply

- tf. tensordot → Calculate dot product of 2 vectors.
- tf. matmul → Matrix multipication

MNIST → • Hand written letters as dataset from keras

→ (60,000, 28, 28) ← Shape.

Working on MNIST:

(Normalizing)

• Reshaping the ~~x~~ pixels by dividing 255.

Sequential Model Building:

• Dense (512 , "relu")

No. of Inputs Nodes. ↑ activation function. ↑

Output Layer: • No. of nodes may vary, based on what is wanted

• Binary: 2.

• Regression: 1

⭐ Activation function is not used in regression problems, as it may affect the output

~~Classification~~ Classification → Sigmoid

→ tanh

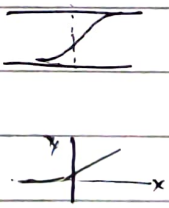
Activation functions: • Sigmoid

• tanh

• RELU.

• Leaky RELU

• Softmax



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Compile : Optimizers : ADAM.

Fit data : • Epochs = Iterations.
• Verbose = let the model know how much information is to be given
- 0 = No info given.

Overfitting : • Use the test-validation graphs to find if the model is ~~not~~ overfitting.

{the model learns too well on the training set that it performs poorly on the testing data}

• Can occur due to small sample size OR the model learns too well on the training data set

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Vigyan Highlight : 2

Google ~~Earth~~ : • Best gen AI for video & Image generation!
→ "VideoFX" tool.
