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DNN

Forward Propagation using tensorflow

AIM- write a program in python for forward propagation using tensorflow

Theory-

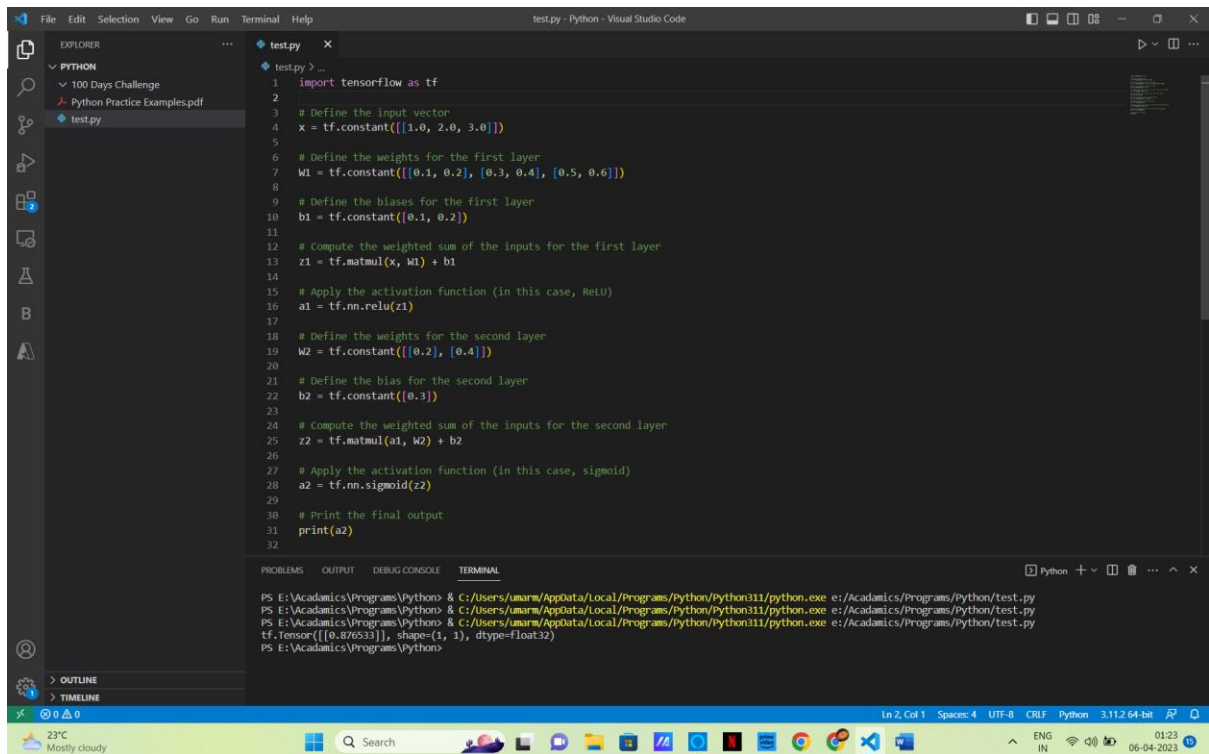
Forward propagation is the process by which an input is fed forward through a neural network, and the output is obtained after passing through the hidden layers. In other words, it involves applying a series of mathematical functions to an input in order to generate an output.

During forward propagation, each neuron in the network receives weighted inputs from the previous layer, applies an activation function to that input, and then passes the output to the next layer. This process continues through all the hidden layers until the final output layer.

The output produced during forward propagation is then compared with the desired output through a process called backpropagation, which updates the weights of the network and adjusts the output until it produces the desired outcome.

Forward propagation is a crucial aspect of neural network training and is used in a wide variety of applications

Program-



```
test.py
1 import tensorflow as tf
2
3 # Define the input vector
4 x = tf.constant([[1.0, 2.0, 3.0]])
5
6 # Define the weights for the first layer
7 w1 = tf.constant([[0.1, 0.2], [0.3, 0.4], [0.5, 0.6]])
8
9 # Define the biases for the first layer
10 b1 = tf.constant([0.1, 0.2])
11
12 # Compute the weighted sum of the inputs for the first layer
13 z1 = tf.matmul(x, w1) + b1
14
15 # Apply the activation function (in this case, ReLU)
16 a1 = tf.nn.relu(z1)
17
18 # Define the weights for the second layer
19 w2 = tf.constant([[0.2], [0.4]])
20
21 # Define the bias for the second layer
22 b2 = tf.constant([0.3])
23
24 # Compute the weighted sum of the inputs for the second layer
25 z2 = tf.matmul(a1, w2) + b2
26
27 # Apply the activation function (in this case, sigmoid)
28 a2 = tf.nn.sigmoid(z2)
29
30 # Print the final output
31 print(a2)
32
```

```
PS E:\Academics\Programs\Python> & C:/Users/umarm/AppData/Local/Programs/Python/Python311/python.exe e:/Academics/Programs/Python/test.py
PS E:\Academics\Programs\Python> & C:/Users/umarm/AppData/Local/Programs/Python/Python311/python.exe e:/Academics/Programs/Python/test.py
tf.Tensor([[0.876533]], shape=(1, 1), dtype=float32)
PS E:\Academics\Programs\Python>
```

```
PS E:\Academics\Programs\Python> & C:/Users/umarm/AppData/Local/Programs/Python/Python311/python.exe e:/Academics/Programs/Python/test.py
PS E:\Academics\Programs\Python> & C:/Users/umarm/AppData/Local/Programs/Python/Python311/python.exe e:/Academics/Programs/Python/test.py
tf.Tensor([[0.876533]], shape=(1, 1), dtype=float32)
PS E:\Academics\Programs\Python>
```

Conclusion – Here in this practical we have performed program for forward propagation using tensorflow