

## **EXPERIMENT 4**

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### **A PYTHON PROGRAM TO IMPLEMENT SINGLE LARGER PERCEPTION**

#### **AIM:**

*TO IMPLEMENT A PYTHON PROGRAM WITH SINGLE LARGER PERCEPTION*

#### **CODE:**

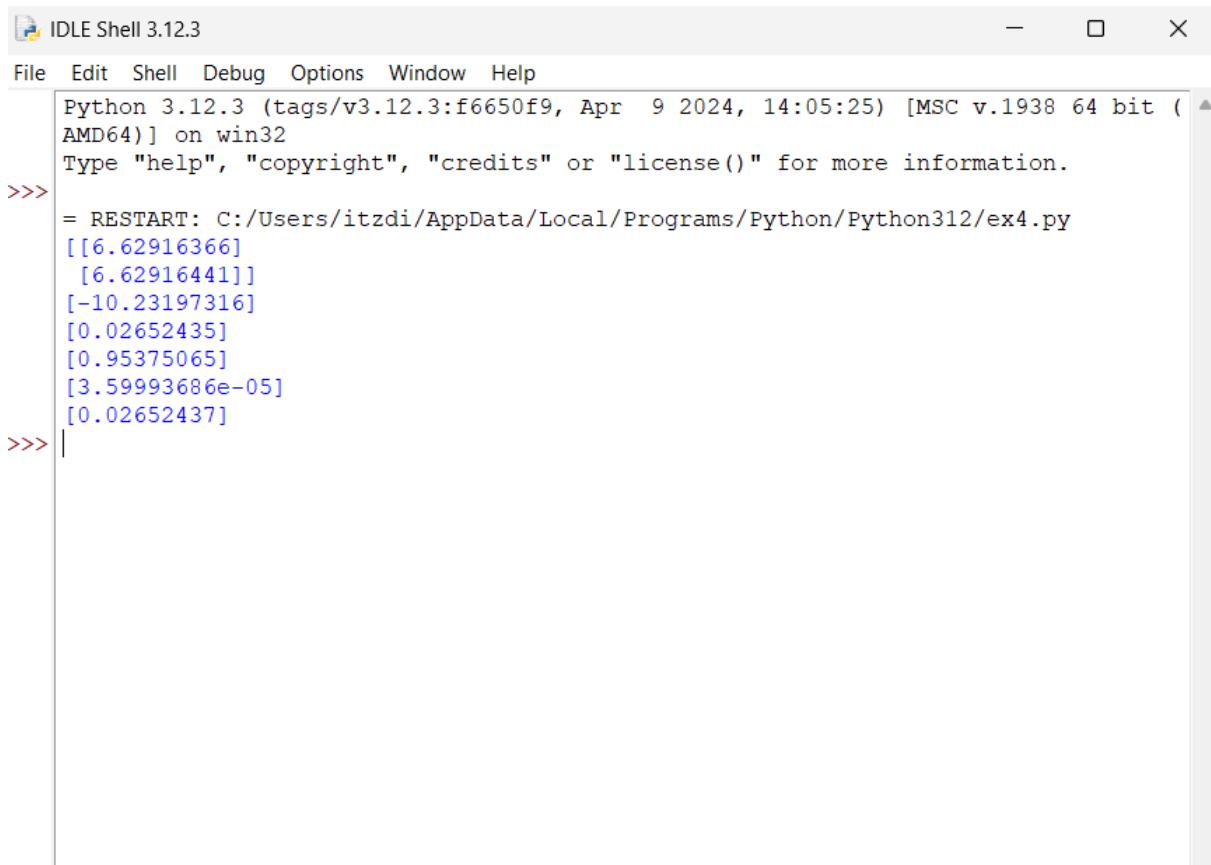
```
import numpy as np
import pandas as pd
input_value=np.array ([[0,0],[0,1],[1,1],[1,0]])
input_value.shape
#(4,2)
output = np.array([0,0,1,0])
output = output.reshape(4,1)
output.shape
#(4,1)
weights=np.array([[0.1],[0.3]])
weights
#array ([[0.1], [0.3]])
bias = 0.2
def sigmoid_func(x):
    return 1/(1+np.exp(-x))
def der(x):
    return sigmoid_func(x)*(1 - sigmoid_func(x))
for epochs in range(15000):
    input_arr = input_value
    weighted_sum=np.dot(input_arr,weights)+bias
    first_output=sigmoid_func(weighted_sum)
    error=first_output - output
    total_error=np.square(np.subtract(first_output,output)).mean()
    first_der=error
    second_der=der(first_output)
    derivative=first_der*second_der
```

```

t_input = input_value.T
final_derivative = np.dot(t_input, derivative)
weights = weights - (0.05 * final_derivative)
for i in derivative:
    bias = bias - (0.05 * i)
print(weights)
print(bias)
#[16.57299223]
#[16.57299223]
#[-25.14783487]
pred = np.array([1, 0])
result = np.dot(pred, weights) + bias
res = sigmoid_func(result)
print(res)
#[0.00018876]
pred = np.array([1, 1])
result = np.dot(pred, weights) + bias
res = sigmoid_func(result)
print(res)
#[0.99966403]
pred = np.array([0, 0])
result = np.dot(pred, weights) + bias
res = sigmoid_func(result)
print(res)
#[1.19793729e-11]
pred = np.array([0, 1])
result = np.dot(pred, weights) + bias
res = sigmoid_func(result)
print(res)
#[0.00063036]

```

## **OUTPUT:**



The screenshot shows the IDLE Shell interface with the title bar "IDLE Shell 3.12.3". The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The main window displays the following Python session:

```
Python 3.12.3 (tags/v3.12.3:f6650f9, Apr  9 2024, 14:05:25) [MSC v.1938 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> = RESTART: C:/Users/itzdi/AppData/Local/Programs/Python/Python312/ex4.py
[[6.62916366]
 [6.62916441]
 [-10.23197316]
 [0.02652435]
 [0.95375065]
 [3.59993686e-05]
 [0.02652437]

>>> |
```

**RESULT:**

*A PYTHON PROGRAM TO IMPLEMENT SINGLE LARGER PERCEPTION AS  
BEEN ANALYSED AND VERIFIED*