EX.NO: 02 **COMPUTING THE SIGMOID AND TANH VALUES**

DATE: 23/02/2024 **USING NUMPY**

AIM:

To compute their sigmoid and tanh (hyperbolic tangent) values using NumPy and plot the values.

INTEGRATED DEVELOPMENT ENVIRONMENT (IDE) REQUIRED:

JUPYTER NOTEBOOK

REQUIRED LIBRARIES FOR PYTHON:

- Numpy
- MatplotLib

PROCEDURE:

STEP 1: Import required libraries

STEP 2: Write code to define the sigmoid function.

STEP 3: Write code to define the tanh function.

STEP 4: Generate a random array of values using numpy

Random_values = np.random.randn(no of values)

STEP 5: Calculate the sigmoid and tanh (hyperbolic tangent) of these random values.

Call sigmoid function return 1/(1+np.exp(-x))

Call tanh function return np.tanh(x)

STEP 6: Plot the values

PROGRAM:

```
import numpy as np
import matplotlib.pyplot as plt

# Generate random values
arr= np.random.random((1,5))
arr=np.sort(arr)
print(arr)
```

```
[[0.12608057 0.25118506 0.37138252 0.69029029 0.95292455]]
```

```
#generating tan values

tan=np.tanh(arr)
print(tan)
```

```
[[0.12541672 0.24603231 0.3552004  0.59816846 0.74110419]]
```

```
#generating sigmoid values

sig=1/(1+np.exp(-arr))
print(sig)
```

```
[[0.53147845 0.56246816 0.591793   0.6660315  0.72170295]]
```

```
#Plotting the values

plt.subplot(1,2,1)

plt.plot(arr[0],sig[0],'ob',linestyle='-',label='Sig(X)')
plt.title("Sigmoid values")
plt.xlabel('X')
plt.ylabel('Y')
plt.grid(True)
plt.legend()
```

```
plt.tight_layout()
plt.show()


plt.subplot(1,2,2)

plt.plot(arr[0],tan[0],'*r',linestyle='-',label='tanh(X)')
plt.title('Tanh values')
plt.xlabel('X')
plt.ylabel('Y')
plt.grid(True)
plt.legend()

plt.tight_layout()
plt.show()
```

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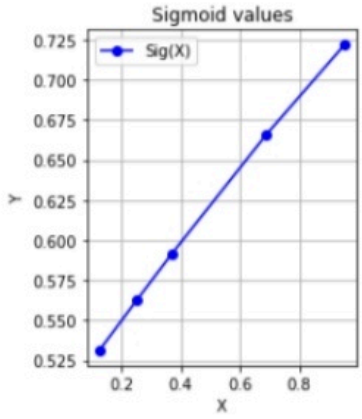
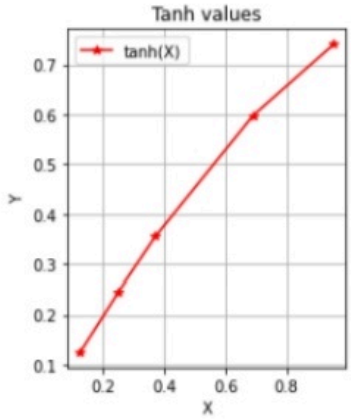
OUTPUT:





RESULT:

The Program was executed successfully