

Assignment No.: 01

Write a Python program to plot a few activation functions that are being used in neural networks.

CODE:

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

def sigmoid(x):
    return 1 / (1 + np.exp(-x))

def tanh(x):
    return np.tanh(x)

def relu(x):
    return np.maximum(0, x)

def linear(x):
    return x

# Generate x values
x = np.linspace(-5, 5, 100)

# Compute y values for each activation function
y_sigmoid = sigmoid(x)
y_tanh = tanh(x)
y_relu = relu(x)
y_softmax = linear(x)
```

```
# Plotting
```

```
plt.figure(figsize=(12, 8))
```

```
plt.subplot(2, 2, 1)
```

```
plt.plot(x, y_sigmoid, label='Sigmoid')
```

```
plt.title('Sigmoid Activation Function')
```

```
plt.legend()
```

```
plt.subplot(2, 2, 2)
```

```
plt.plot(x, y_tanh, label='Tanh')
```

```
plt.title('Hyperbolic Tangent (tanh) Activation Function')
```

```
plt.legend()
```

```
plt.subplot(2, 2, 3)
```

```
plt.plot(x, y_relu, label='ReLU')
```

```
plt.title('Rectified Linear Unit (ReLU) Activation Function')
```

```
plt.legend()
```

```
plt.subplot(2, 2, 4)
```

```
plt.plot(x, y_softmax, label='Linear')
```

```
plt.title('Linear Activation Function')
```

```
plt.legend()
```

```
plt.tight_layout()
```

```
plt.show()
```

OUTPUT:

