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ACTIVATION FUNCTION

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import numpy as np
import matplotlib.pyplot as plt

def step_function(x):
    return np.where(x >= 0, 1, 0)

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

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

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

def leaky_relu_function(x, alpha=0.01):
    return np.where(x > 0, x, alpha * x)

x = np.linspace(-10, 10, 400)

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

plt.subplot(2, 3, 1)
plt.plot(x, step_function(x), label='Step Function', color='blue')
plt.title('Step Function')
plt.grid(True)

plt.subplot(2, 3, 2)
plt.plot(x, sigmoid_function(x), label='Sigmoid Function', color='red')
plt.title('Sigmoid Function')
plt.grid(True)

plt.subplot(2, 3, 3)
plt.plot(x, tanh_function(x), label='Tanh Function', color='green')
plt.title('Tanh Function')
plt.grid(True)

plt.subplot(2, 3, 4)
plt.plot(x, relu_function(x), label='ReLU Function', color='orange')
plt.title('ReLU Function')
plt.grid(True)

plt.subplot(2, 3, 5)
plt.plot(x, leaky_relu_function(x), label='Leaky ReLU Function', color='purple')
plt.title('Leaky ReLU Function')
plt.grid(True)
```

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