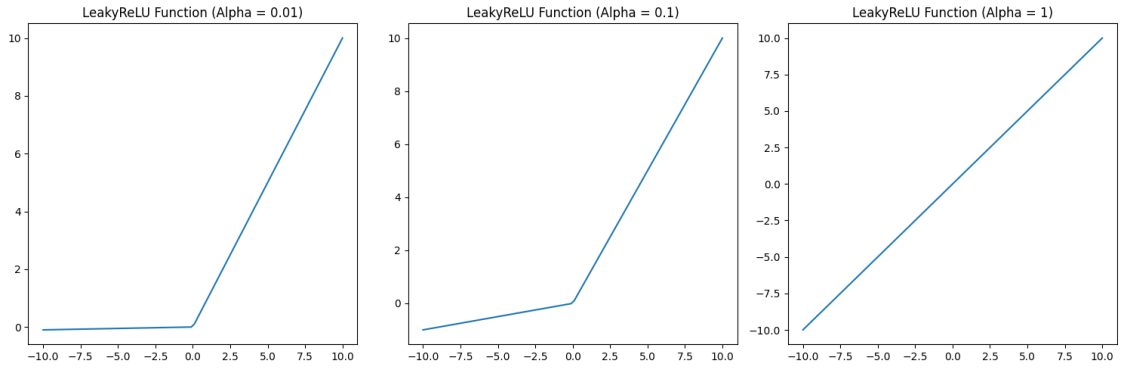
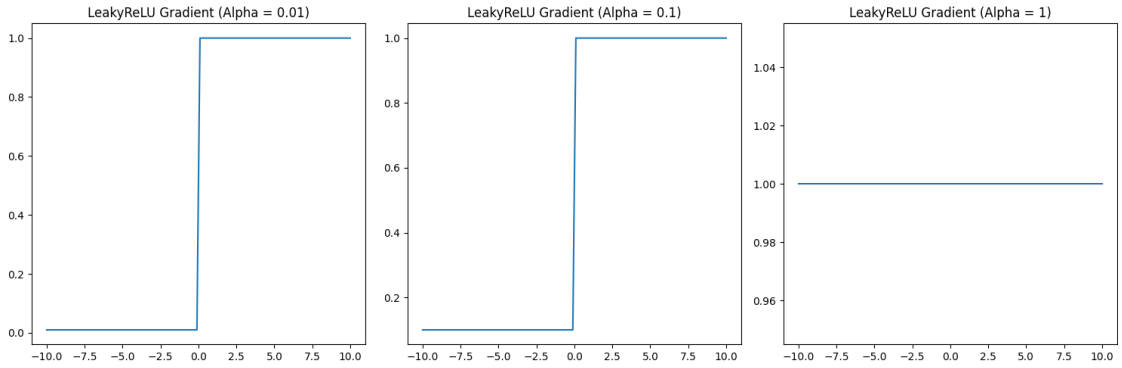
lab6

December 4, 2023

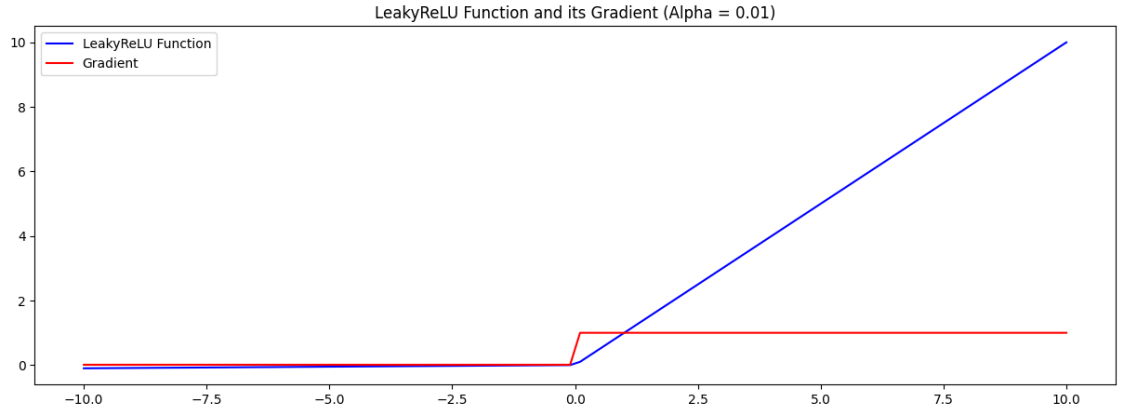
[5]:
```
import numpy as np

def leakyrelu(x, alpha = 0.01):
    return np.maximum(alpha*x, x)

import matplotlib.pyplot as plt

xs = np.linspace(-10,10,100)
y1 = leakyrelu(xs, 0.01)
y2 = leakyrelu(xs, 0.1)
y3 = leakyrelu(xs, 1)

plt.figure(figsize=(15, 5))

plt.subplot(1, 3, 1)
plt.plot(xs, y1)
plt.title('LeakyReLU Function (Alpha = 0.01)')

plt.subplot(1, 3, 2)
plt.plot(xs, y2)
plt.title('LeakyReLU Function (Alpha = 0.1)')

plt.subplot(1, 3, 3)
plt.plot(xs, y3)
plt.title('LeakyReLU Function (Alpha = 1)')

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



[6]:
```
def leakyrelu_gradient(x, alpha = 0.01):
    return np.where(x > 0, 1, alpha)

xs = np.linspace(-10,10,100)
ygradient1 = leakyrelu_gradient(xs, 0.01)
ygradient2 = leakyrelu_gradient(xs, 0.1)
ygradient3 = leakyrelu_gradient(xs, 1)

plt.figure(figsize=(15, 5))

plt.subplot(1, 3, 1)
plt.plot(xs, ygradient1)
plt.title('LeakyReLU Gradient (Alpha = 0.01)')

plt.subplot(1, 3, 2)
plt.plot(xs, ygradient2)
plt.title('LeakyReLU Gradient (Alpha = 0.1)')

plt.subplot(1, 3, 3)
plt.plot(xs, ygradient3)
plt.title('LeakyReLU Gradient (Alpha = 1)')

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



[7]:
```
plt.figure(figsize=(15, 5))

xs = np.linspace(-10,10,100)
y1 = leakyrelu(xs, 0.01)
ygradient1 = leakyrelu_gradient(xs, 0.01)

plt.plot(xs, y1, 'b', label='LeakyReLU Function')
plt.plot(xs, ygradient1, 'r', label='Gradient')
plt.title('LeakyReLU Function and its Gradient (Alpha = 0.01)')
plt.legend(loc='upper left')
plt.show()
```



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