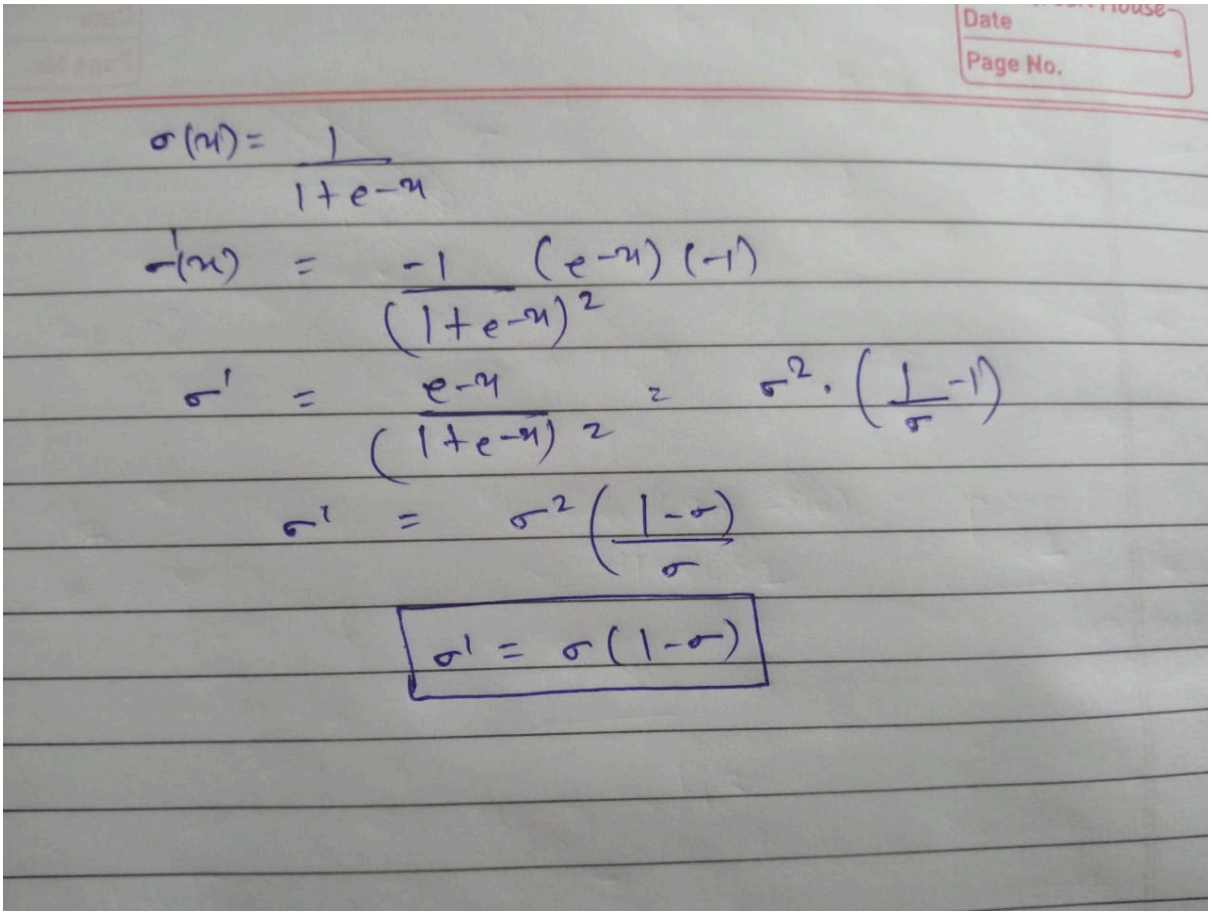
Assignment 03 (EE655)

Ques1. Find the Derivative of Sigmoid function ?



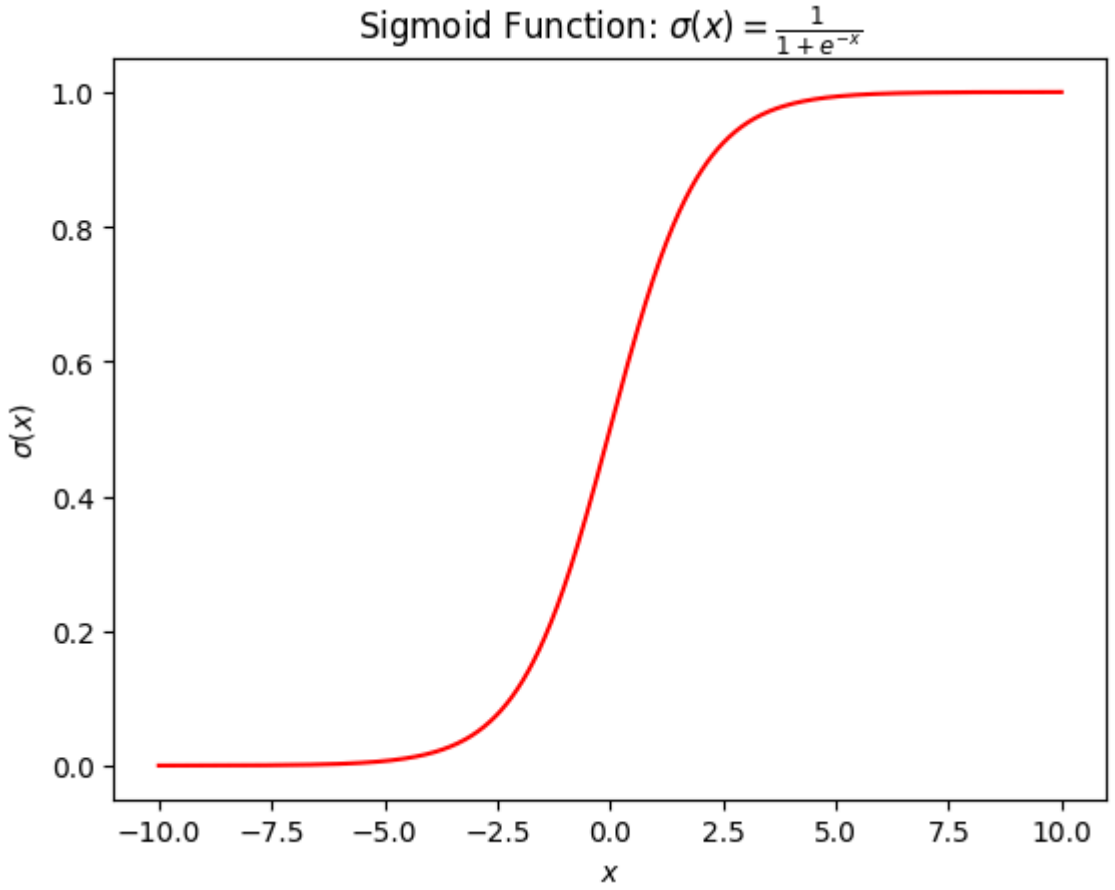
Ques2. Code for plotting the graph of Sigmoid function.

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

```
x = np.linspace(-10,10,1000)
y = np.exp(-x)
```

```
sigmoid = 1/(1+y)
```

```
plt.plot(x,sigmoid,label=r'$\sigma(x) = \frac{1}{1 + e^{-x}}$',color='r')
plt.xlabel(r"$x$")
plt.ylabel(r"$\sigma(x)$")
plt.title(r"Sigmoid Function: $\sigma(x) = \frac{1}{1 + e^{-x}}$")
```

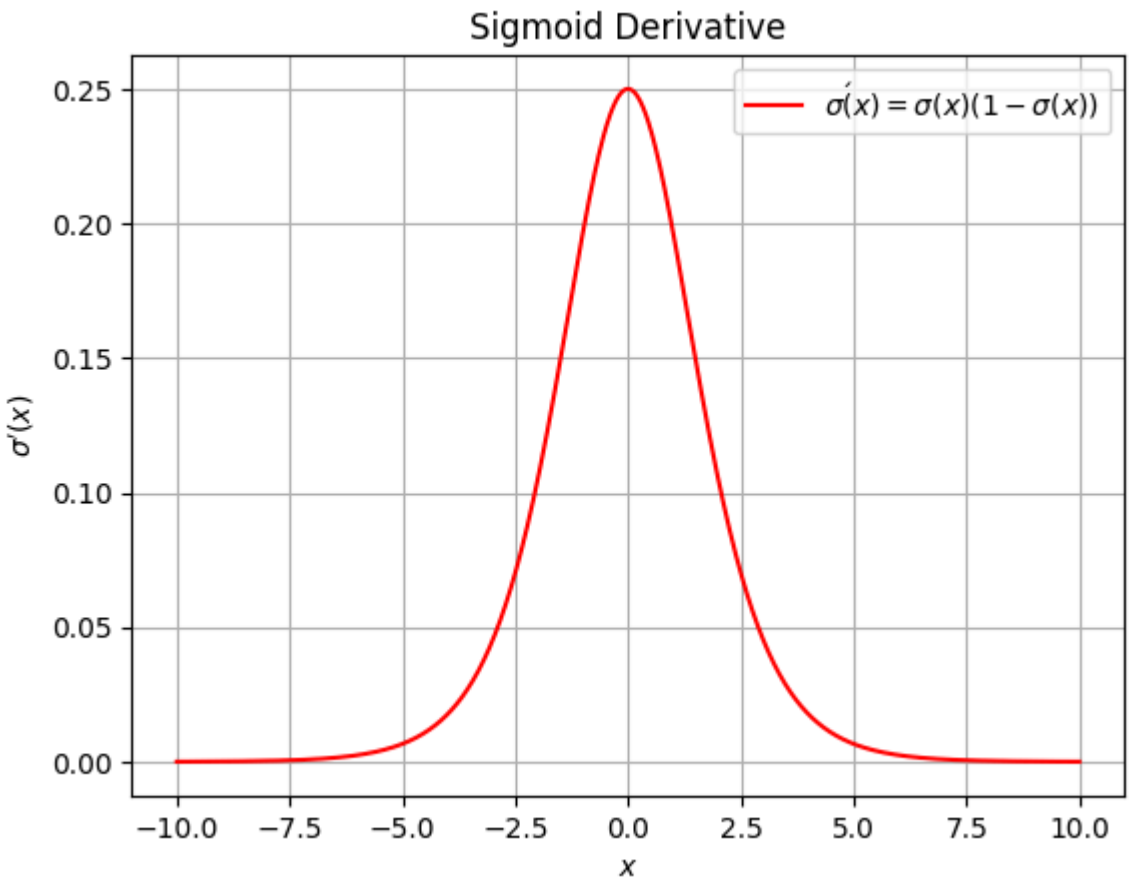


Ques3. Code for Plotting the graph of the Derivative of Sigmoid function ?

```
Derivative = sigmoid*(1-sigmoid)
```

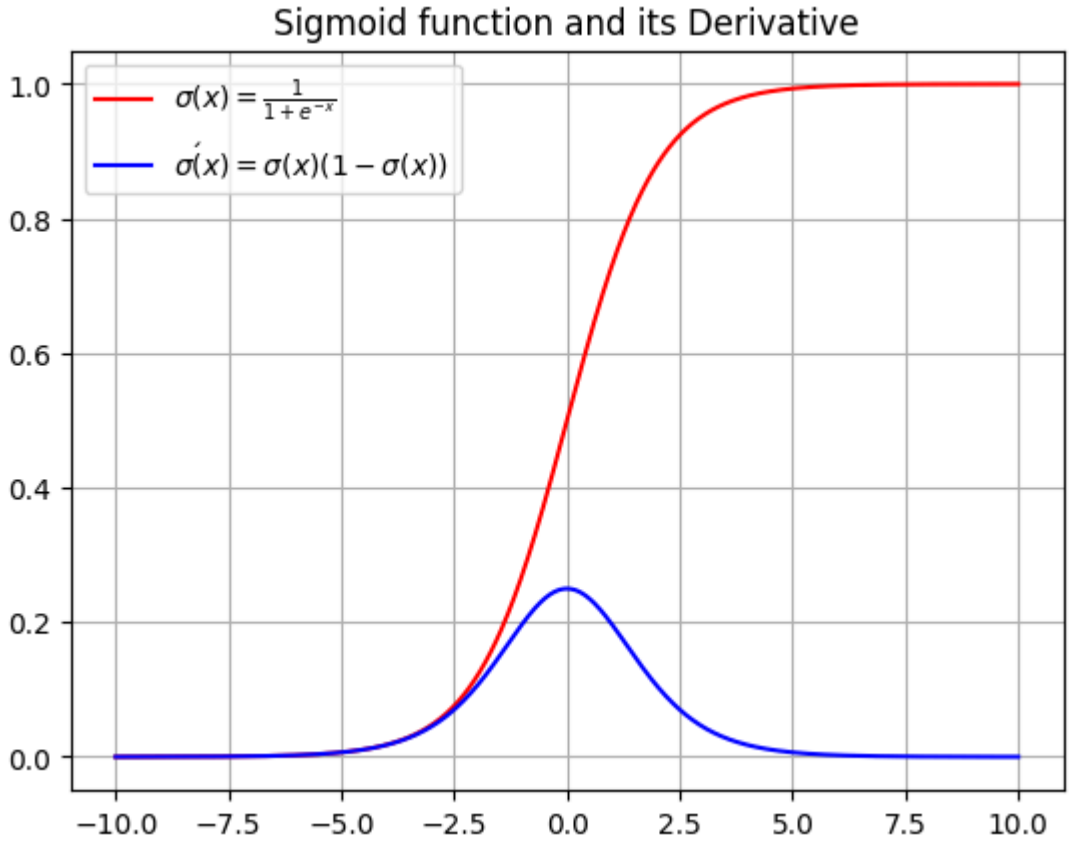
```
plt.plot(x, Derivative,color='r')
plt.xlabel(r"$x$")
plt.ylabel(r"$\sigma'(x)$")
plt.title(r"Sigmoid Derivative")
plt.grid(True)
plt.legend()
```

```
plt.show()
```



Code for Plotting both functions on the same graph.

```
plt.plot(x,sigmoid,label=r'$\sigma(x) = \frac{1}{1 + e^{-x}}$',color='r')
plt.plot(x, Derivative,label=r'$\sigma\'(x) = \sigma(x)(1 - \sigma(x))$',color='b')
plt.grid(True)
plt.title(r"Sigmoid function and its Derivative")
plt.legend()
plt.show()
```


Sigmoid function and its Derivative
$\sigma(x) = \frac{1}{1+e^{-x}}$
$\sigma'(x) = \sigma(x)(1-\sigma(x))$
1.0
0.8
0.6
0.4
0.2
0.0
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0