import matplotlib.pyplot as plt

import numpy as np

def tanh(x):

t=(np.exp(x)-np.exp(-x))/(np.exp(x)+np.exp(-x))

dt=1-t\*\*2

return t,dt

z=np.arange(-4,4,0.01)

tanh(z)[0].size,tanh(z)[1].size

fig, ax = plt.subplots(figsize=(9, 5))

ax.spines['left'].set\_position('center')

ax.spines['bottom'].set\_position('center')

ax.spines['right'].set\_color('none')

ax.spines['top'].set\_color('none')

ax.xaxis.set\_ticks\_position('bottom')

ax.yaxis.set\_ticks\_position('left')

ax.plot(z,tanh(z)[0], color="#307EC7", linewidth=3, label="tanh")

ax.plot(z,tanh(z)[1], color="#9621E2", linewidth=3, label="derivative")

ax.legend(loc="upper right", frameon=False)

fig.show()

'''

Observations:

Its output is zero-centered because its range is between -1 to 1. i.e. -1 < output < 1.

Optimization is easier in this method hence in practice it is always preferred over the Sigmoid function.

'''