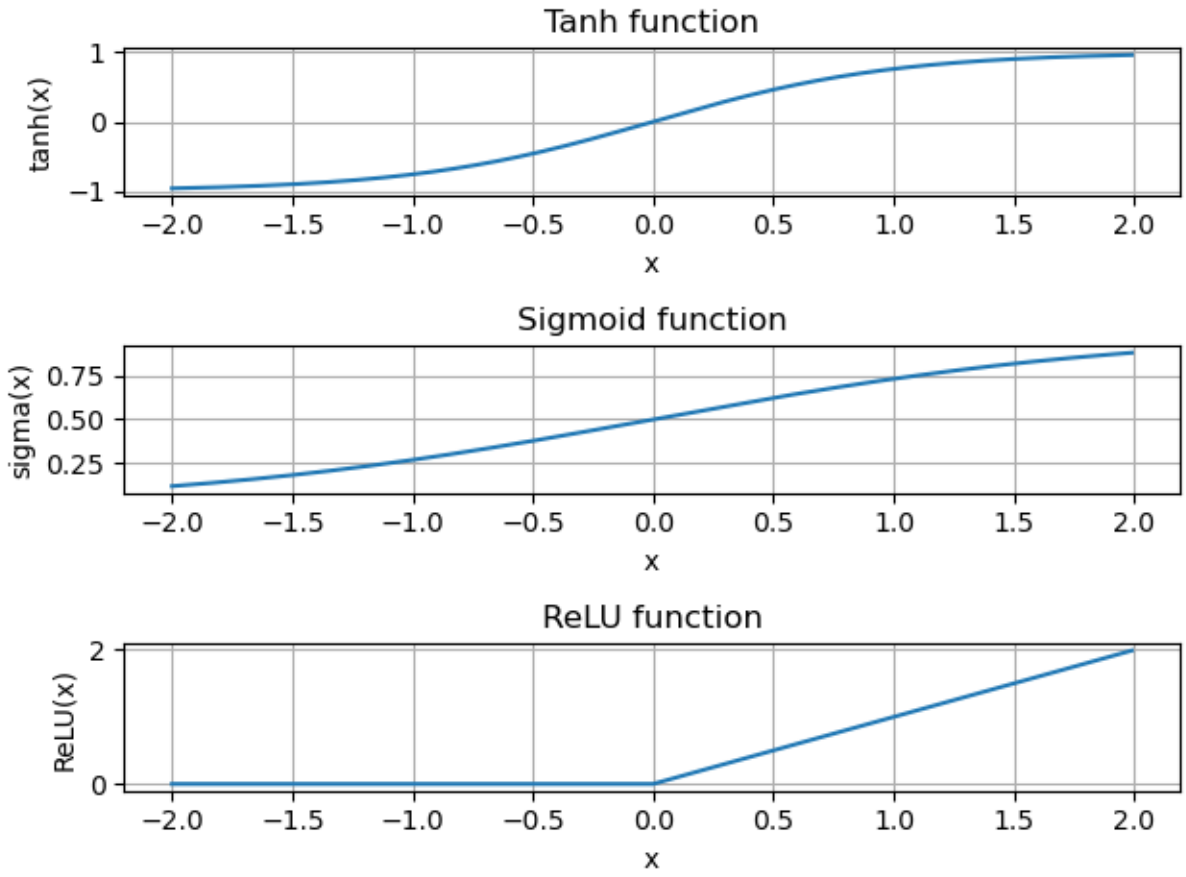

Figure 1: Activation functions plot.

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April 3, 2024

HOMEWORK 1 — Report

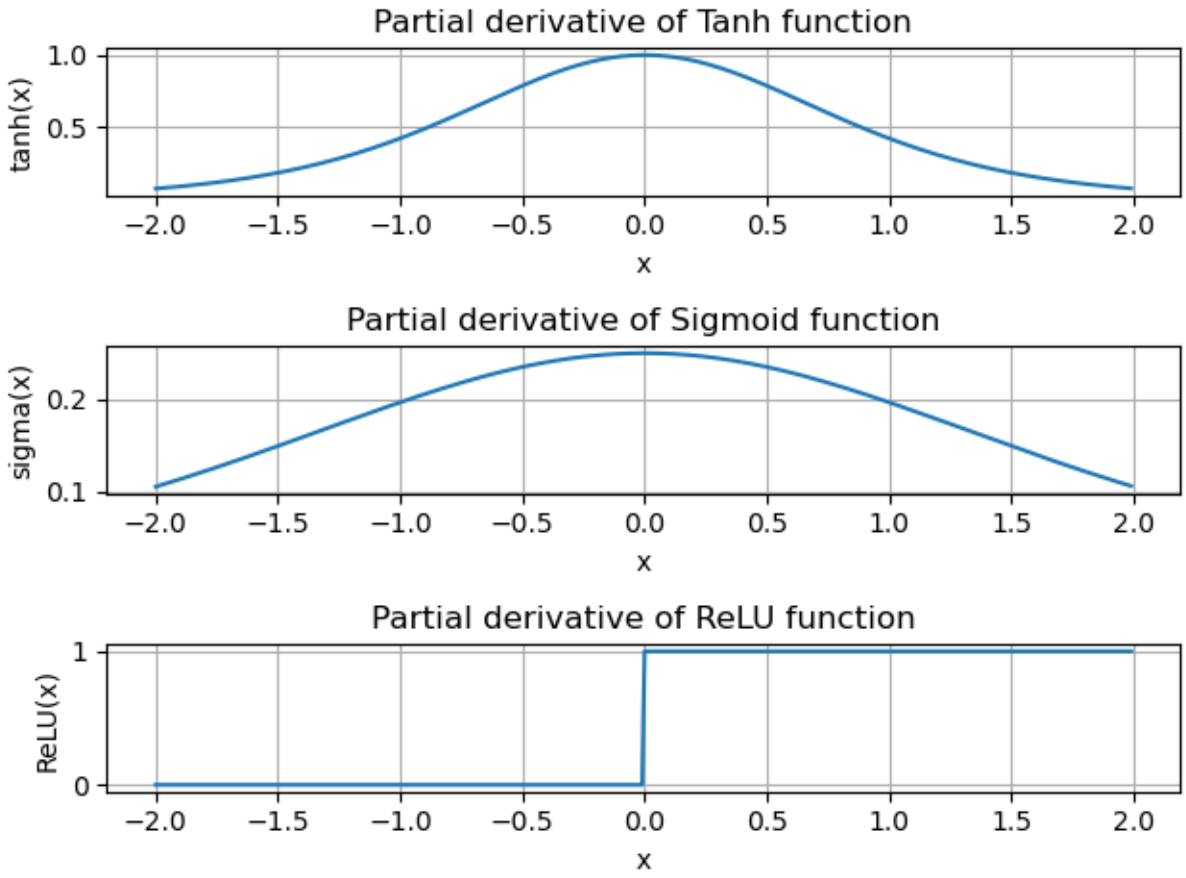

Figure 2: Gradients of the activation functions plot.

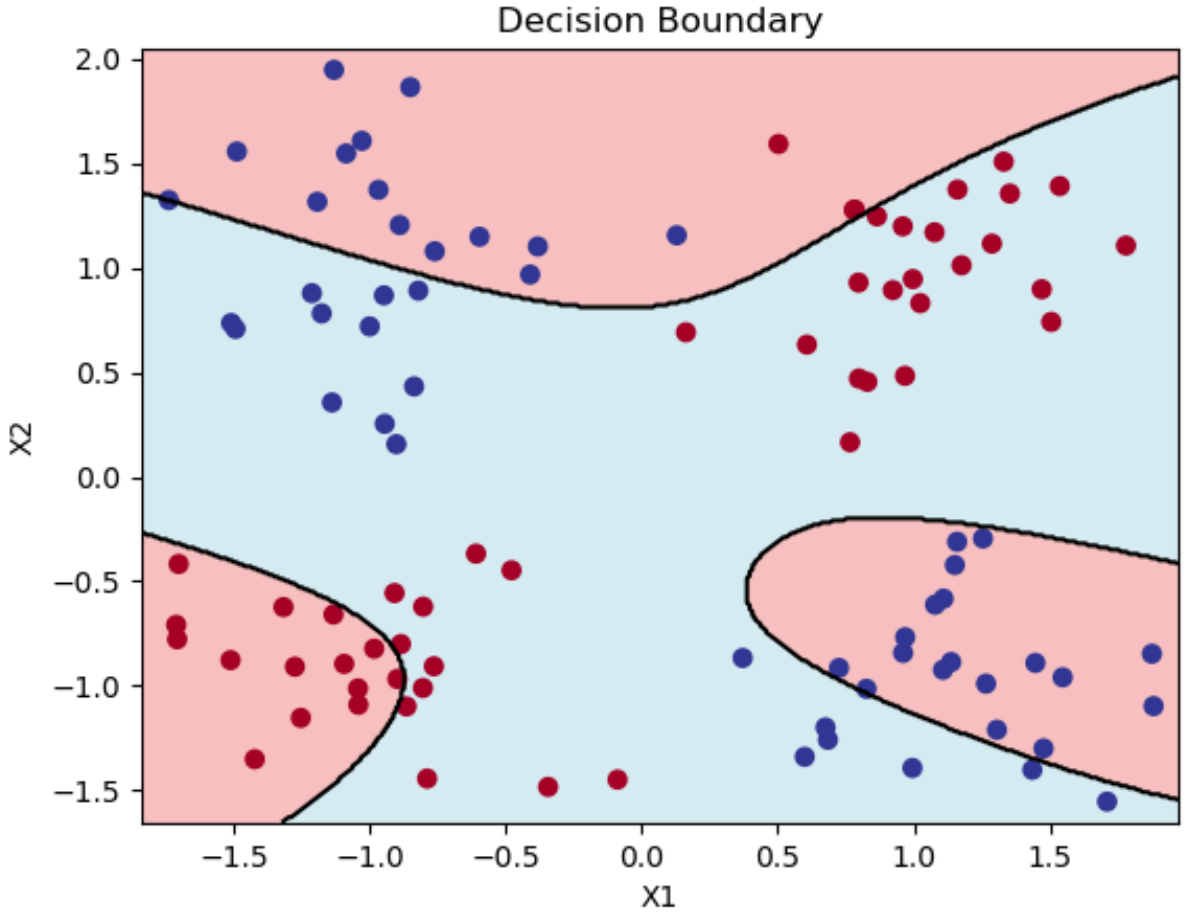

Figure 3: Sigmoid activated XOR problem output.

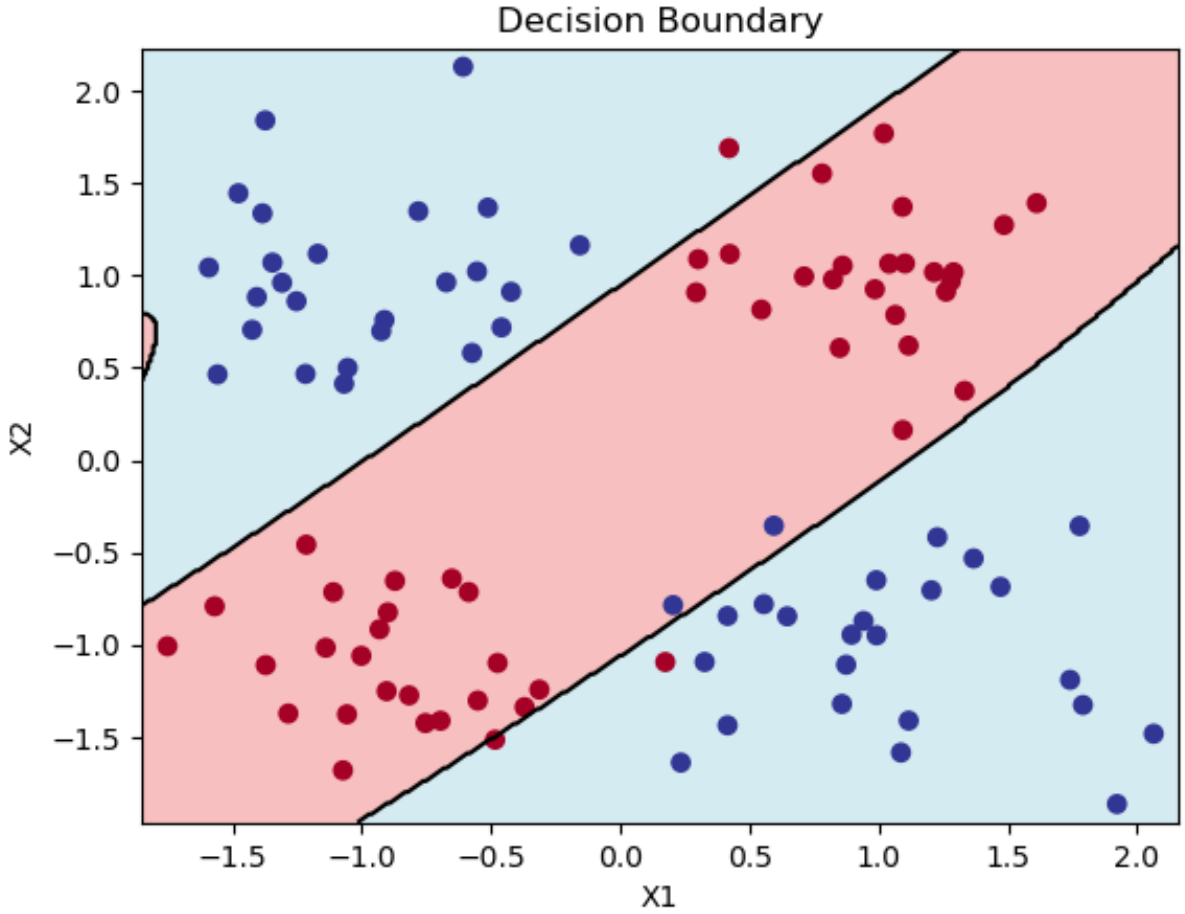

Figure 4: Tanh activated XOR problem output.

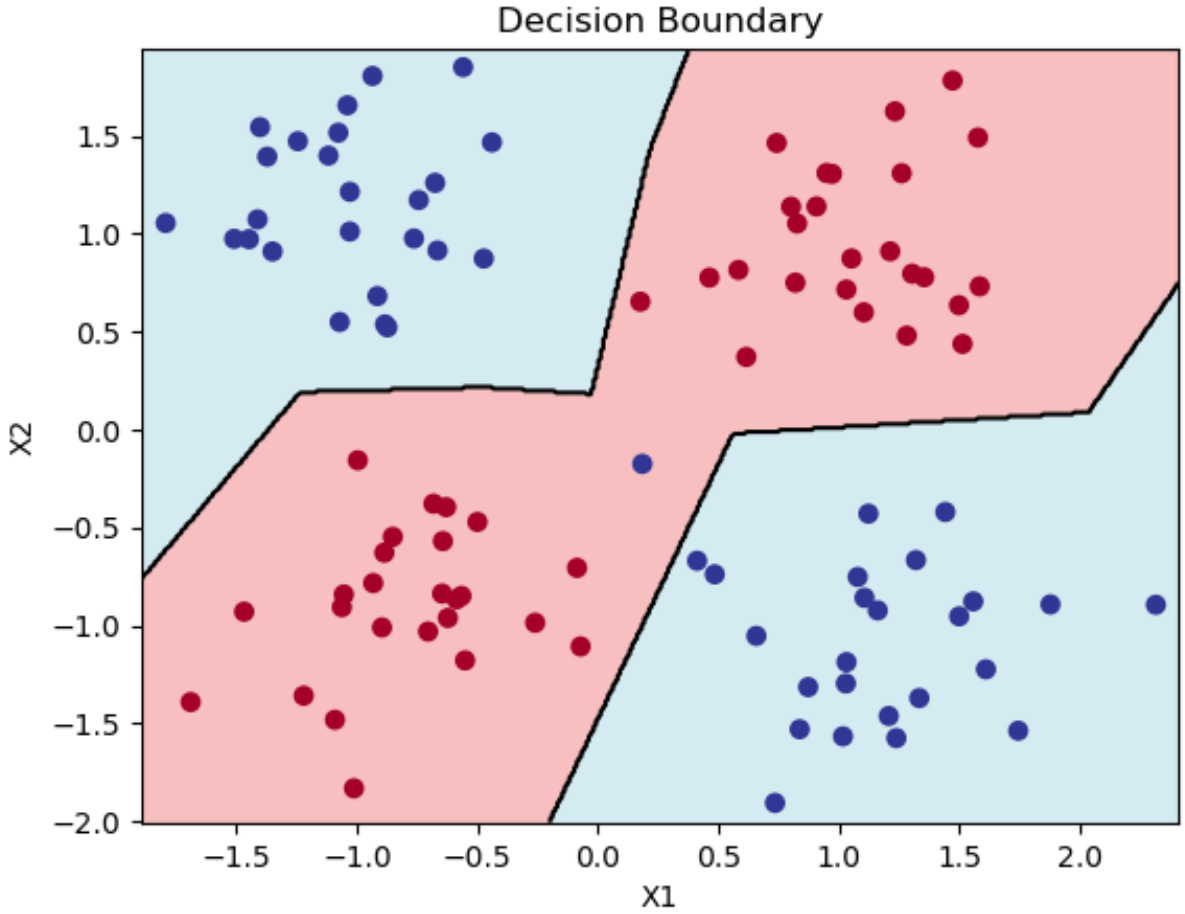

Figure 5: ReLU activated XOR problem output.

1 Question 1

1.1 Question 1.1

1.2 Question 1.2

2 Question 2

3 Question 3

4 Question 4

5 Question 5

6 References

References

[1] M. Stimberg, R. Brette, and D. F. Goodman, "Brian 2, an intuitive and efficient neural simulator," *eLife*, vol. 8, p. e47314, Aug. 2019.

[2] R. Brette, M. Rudolph-Lilith, N. T. Carnevale, M. L. Hines, D. Beeman, J. M. Bower, M. Diesmann, A. Morrison, P. H. Goodman, F. C. Harris, M. Zirpe, T. Natschläger, D. Pecevski, B. Ermentrout, M. Djurfeldt, A. Lansner, O. Rochel, T. Viéville, E. B. Müller, A. P. Davison, S. E. Boustani, and A. Destexhe, "Simulation of networks of spiking neurons: A review of tools and strategies," *Journal of Computational Neuroscience*, vol. 23, pp. 349–398, 2006.

Submitted by Ahmet Akman 2442366 on April 3, 2024.