Assignment 3

November 14, 2018

1 Assignment 3

1.1 Printed copy due in class on November 14, 2018

You may work in pairs on this assignment. You are not permitted to discuss this assignment with anyone other than your partner or the instructors.

1.1.1 Student 1: Dmitriy Timokhin

1.1.2 Student 2: Hanson Egbert

2 Question 1: Neural Networks by Hand

2.1 Part A

Suppose we train a neural network using the ReLU activation function:

$$g(a) = \max(a, 0).$$

1. Draw the graph of $g(a)$. (Matplotlib plots are acceptable.)
2. What is the derivative $h = g'(a)$ in terms of the input a?
3. What is the derivative $h = g'(a)$ in terms of the output h?

```
In [1]: import numpy as np
        import pandas as pd
        import matplotlib.pyplot as plt

        %matplotlib inline
```

2.2 1)

```
In [2]: def ReLU(a):
            return np.max([a, 0])

        def ReLUderiv(a):
            if a <= 0:
                return 0
            else:
```