

**Programming Assignment 3**

**Issued:** Friday 25<sup>th</sup> October, 2019

**Due:** Sunday 10<sup>th</sup> November, 2019

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3.1. (BP Neural Network) Suppose we are given a dataset  $\{x^{(i)}, y^{(i)} : i = 1, 2, \dots, m\}$  generated by

$$y^{(i)} = \sin x^{(i)} \quad \forall i \quad (1)$$

Please design a neural network to represent this function using back-propagation. The structure of the network is:

1. Input layer, shape  $N \times 1$ ,  $N$  is batch size
2. Linear layer, shape  $1 \times 80$
3. ReLU activation layer
4. Linear layer, shape  $80 \times 1$

**Notice:**

1. Submit your codes and the results in image or pdf.
2. **DO NOT** change other part of codes apart from the given spaces for you to fill, the parameters are carefully tuned in advance.
3. The final result would be like Fig.1 if your code is right.

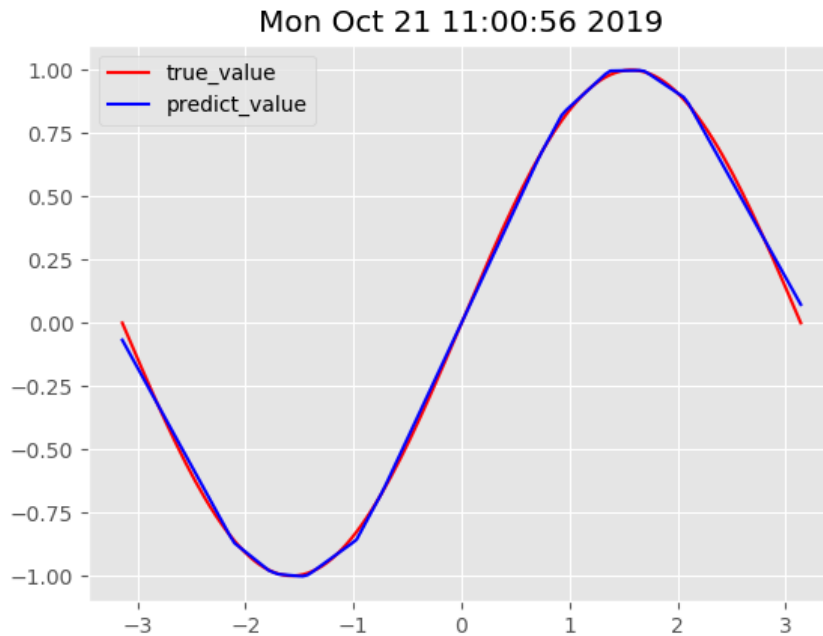


Figure 1: Output result.