Beihang University
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Data Management and Artificial Intelligence Homework 14

Task 1 *Please implement a single perceptron in Python that is able to give an output with specific input values. The algorithm should start with randomly generated weights* $\boldsymbol{w}$*. It should be able to find the appropriate values for the weights by updating it iteratively with a given supervised learning method. For example, you can start with the following rule,*

$$w_i' = w_i + \alpha \cdot (y - g(x, w)) \cdot x_i$$

which is also shown in the lecture slides.

With the result of the input function, activation functions should also be implemented and again, you can start with the simple step function. Note that this algorithm should work for all linearly separable inputs and you can test your code with the operations "AND" and "OR" as shown in Table 1.

Table 1: "AND", "OR" and "XOR".

x_0	x_1	$x_0\ AND\ x_1$	$x_0\ OR\ x_1$	$x_0\ XOR\ x_1$
0	0	0	0	0
0	1	0	1	1
1	0	0	1	1
1	1	1	1	0