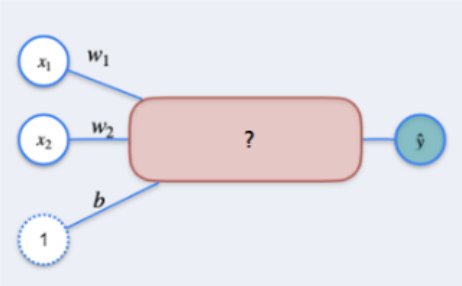
Congratulations! You passed!

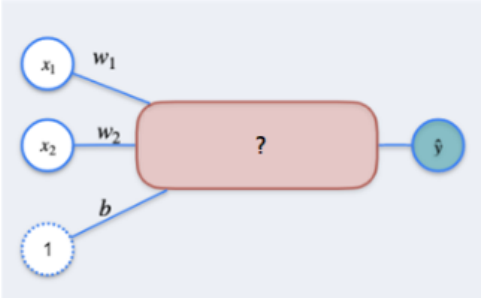
Grade received 100% To pass 80% or higher

Go to next item

1. **Given the Single Layer Perceptron described in the lectures:** 1 / 1 point



1. **Given the Single Layer Perceptron described in the lectures:** 1 / 1 point



What should be replaced in the question mark?

- ○ $w_1w_2 + x_1x_2 + b$
- ○ $w_1x_1 + w_2x_2 + b_1 + b_2$
- ◉ $w_1x_1 + w_2x_2 + b$
- ○ $w_1x_2 + w_2x_1 + b$

Correct

Correct! In a single layer perceptron, we evaluate a (weighted) linear combination of the inputs plus a constant term, which represents the *bias*!

2. **For a Regression using a Single Layer Perceptron, select all that apply:** 1 / 1 point

- [ ] The Loss Function used is $L(y, \hat{y}) = -y \ln(\hat{y}) - (1 - y) \ln(1 - \hat{y})$.
- [x] The Loss Function used is $L(y, \hat{y}) = \frac{1}{2}(y - \hat{y})^2$.

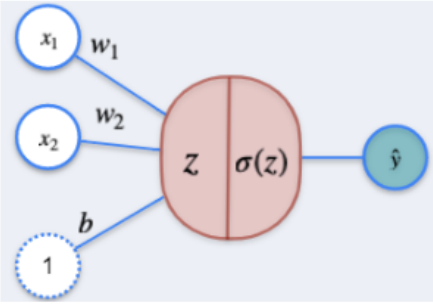
Correct
Correct! This is the mean squared error, usually used as a loss function for regression.

- [x] To minimize the Loss Function, we consider $L(y, \hat{y})$ as a function of w_1, w_2 and b.

Correct
Correct! We see the Loss Function as a function of w_1, w_2 and b so we can perform Gradient Descent to find the optimal parameters that minimize it!

- [ ] To minimize the Loss Function, we consider $L(y, \hat{y})$ as a function of x_1 and x_2.

3. **Consider the problem of Classification using a Single Layer Perceptron as discussed in the lectures.** 1 / 1 point

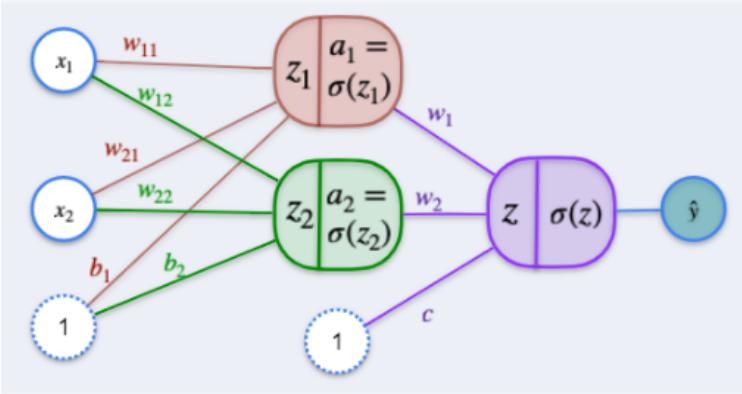


In the figure above, z and $\sigma(z)$ are, respectively:

- ○ $z = w_1x_1 + w_2x_2 + b$ and $\sigma(z) = \frac{1}{2}(z - \hat{z})^2$
- ○ $z = \frac{1}{1+e^{-z}}$ and $\sigma(z) = w_1x_1 + w_2x_2 + b$
- ○ $z = x_1 + x_2 + b$ and $\sigma(z) = \frac{1}{2}(z - \hat{z})^2$
- ◉ $z = w_1x_1 + w_2x_2 + b$ and $\sigma(z) = \frac{1}{1+e^{-z}}$

Correct
Correct! In this case, z is a linear combination of the inputs and $\sigma(z)$ is the sigmoid function, so it maps the result to a value between 0 and 1, thus the output can be interpreted as a probability.

4. **In the 2,2,1 Neural Network described below** 1 / 1 point



How many parameters must be tuned to minimize the Loss Function?

How many parameters must be tuned to minimize the Loss Function?

- ○ 2
- ○ 3
- ○ 6
- ◉ 9

✓ **Correct**

Correct! We have 2 inputs, which will generate 2 constant terms (b_1 and b_2), since the next layer has 2 neurons, each input must have 2 parameters, therefore the first layer has 2 + 2*2 = 6 parameters. The hidden layer, therefore, has three more parameters since there are 2 neurons. We also must add another constant term c. In total there are 9 parameters.

5. **About Backpropagation, check all that apply:** 1 / 1 point

- ☐ **It is a way to obtain the input values for a given output of a neural network.**
- ☑ **It is a method to update the parameters of a neural network.**

✓ **Correct**

Correct! This is the method which a neural network updates its parameters.

- ☐ **It is the same as gradient descent.**
- ☑ **It is a method that starts in the output layer and finishes in the input layer.**

✓ **Correct**

Correct! As the name suggests, the backpropagation method iteratively updates the neural network parameters from backwards.