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**Machine Learning with Python-From Linear Models to Deep Learning**[Course](#)[Progress](#)[Dates](#)[Discussion](#)[Resources](#)[Course](#) / [Unit 0. Brief Prerequisite Reviews,...](#) / [Project 0 Setup, Numpy Exercises](#)[< Previous](#)

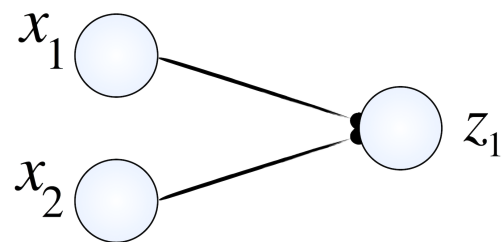
## 5. Exercise

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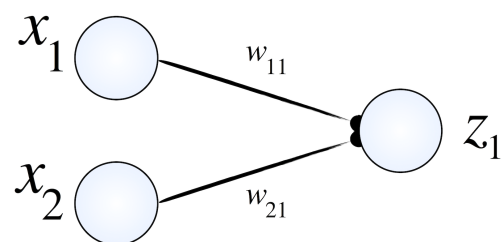
Project0 due Feb 15, 2023 08:59 -03 Completed

As introduced in the previous section, a neural network is a powerful tool often utilized. Because neural networks are, fundamentally, very mathematical, we'll use them to motivate

We review the simplest neural network here:

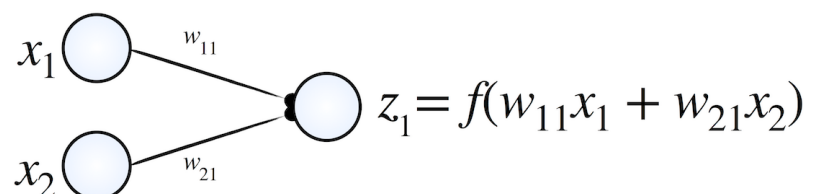


The output of the neural network,  $z_1$ , is dependent on the inputs  $x_1$  and  $x_2$ . The important inputs is given by values called *weights*. There is one weight from each input to each output here:



The inputs are given by  $x$ , and the outputs are given by  $z_1$ . Here,  $w_{11}$  is the weight of input 1 on output 1 (the only output in this case), and  $w_{21}$  is the weight of input 2 on output 1. In general,  $w_{ij}$  represents the weight of input  $i$  on output  $j$ .

The output,  $z_1$ , is given by  $z_1 = f(w_{11}x_1 + w_{21}x_2)$ :



where  $f$  is a specified nonlinear function, and it is usually the hyperbolic tangent function.

If we express our inputs and weights as matrices, as shown here,

$$\rightarrow \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \quad \begin{bmatrix} w_{11} \\ w_{21} \end{bmatrix}$$

**Grader note::** If the grader appears unresponsive and displays "Processing", it means (the grader has) crashed. Please resubmit your answers, and leave a message in the forum and we will work on it as possible.

```
1 def neural_network(inputs, weights):
2     """
3     Takes an input vector and runs it through a 1-layer neural network
4     with a given weight matrix and returns the output.
5
6     Arg:
7         inputs - 2 x 1 NumPy array
8         weights - 2 x 1 NumPy array
9     Returns (in this order):
10        out - a 1 x 1 NumPy array, representing the output of the neural network
11    """
12    out = np.tanh(np.dot(weights.T, inputs))
13    return out
14
15    raise NotImplementedError
```

Press ESC then TAB or click outside of the code editor to exit

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Question could be misleading since using tanh as the activation function is not directly mentioned.

hii i am getting error

Traceback (most recent call last): File "submission.py", line 11, in neural\_network z = np.dot((inputs, weights))

? To TAs- I just enrolled in the course can you extend HW0 deadlines for me

Hi, I enrolled today and the deadline for homework 0 is passed. Can you extend that deadline for me please?

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