

Neural Network

The concept is simple, think about how to make a computer to take a decision, some kind of smart people proposed: $z = x_1 * w_1 + x_2 * w_2 + b$

Where:

- x_1 and x_2 mean: How much i want to do this activity?
- w_1 and w_2 mean: What benefits am i going to get for doing these activities?
- b means: What is my mood right now?
- If the output is over 1 i will do it, otherwise i don't

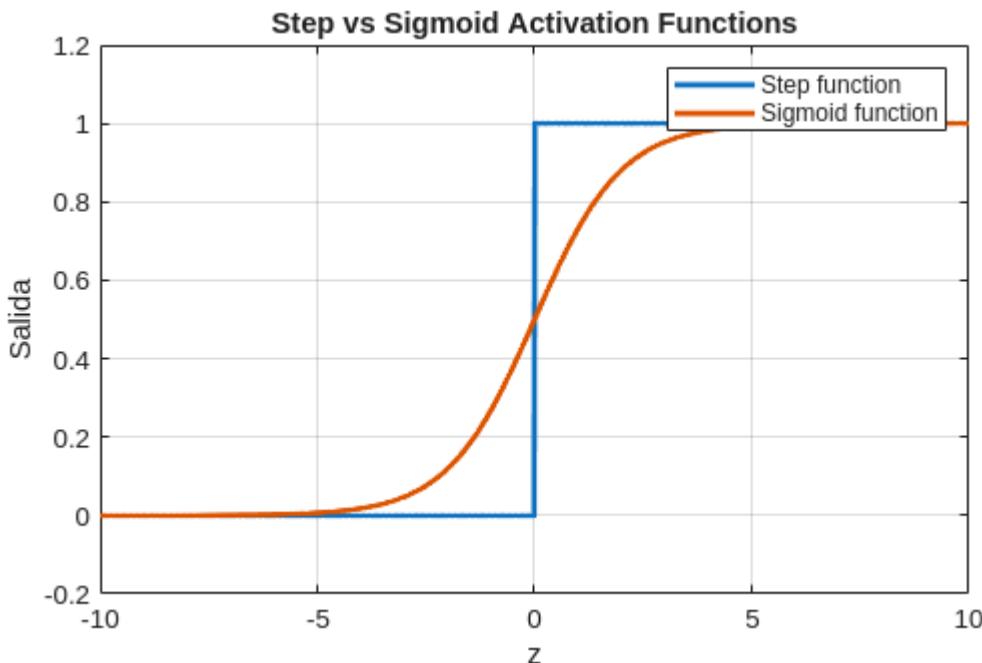
Obviously /'ɒb.vi.əs.li/, you can add as many variables as you want. Suppose you fell in love with a girl and she got pregnant, now i am going to help you to decide if stay or leave the country. Let's define the situation:

- x_1 : How much do i want to have a baby right now? I mean, I am not really excited, so "0.3"
- x_2 : Do I love this girl? Yes and i don't want her to carry a baby alone so "0.9"
- w_1 : How good is having a baby? the stress and money point out to a fair "-0.15"
- w_2 : She loves me? all womans are crazy, but this one is my entire world so 1 (I suppose you love her)
- b : Today i had a really beautiful day, i am doing well in my job so a fair 0.7

$$z = 0.3 * -0.15 + 0.9 * 1 + 0.7 = 1.555$$

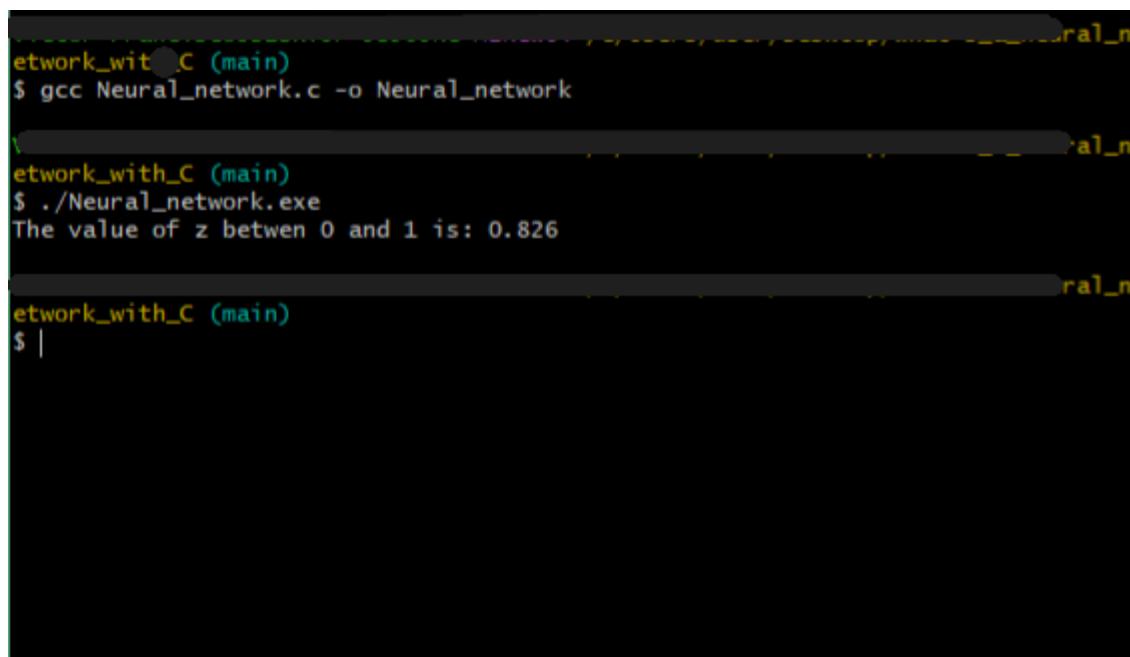
It seems like you are gonna be a father. If you weren't in love, probably the baby will be like one of the many children in Latin America (I am a Latino). We know 1.555 is our number, then we can use the step function to decide rapidly /'ræpɪdli/ what we're gonna do (take care of them) or just use the sigmoid function to give a porcentage of how willing i am.

$$\text{step}(z) = \begin{cases} 0 & , \text{if } z < 0 \\ 1 & , \text{if } z \geq 0 \end{cases}; \sigma(z) = \frac{1}{1 + e^{-z}}$$



Sigmoid Function in C

```
#include <stdio.h>
#include <math.h>
/*
It's no more than defining a new function
*/
void sigmoid_function(float* z_value){ //A function which doesn't return anything and have one pointer
parameter
    *z_value = 1.0 / (1.0 + expf(-1.0 * *z_value) );//*z_value means the value which z_value means is
pointing out
}
//inside expf the first one "*" operator is an operator for multiplying two numbers and the second one
is working with the pointer
int main(void){
    float z = 1.555;
    float* pointer_z = &z;
    sigmoid_function(pointer_z);
    printf("The value of z between 0 and 1 is: %.3f\n",*pointer_z);
}
```



The terminal window shows the following sequence of commands and output:

```
etwork_with_C (main)
$ gcc Neural_network.c -o Neural_network
\ 
etwork_with_C (main)
$ ./Neural_network.exe
The value of z between 0 and 1 is: 0.826

etwork_with_C (main)
$ |
```