Machine Learning in C

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Basic Example of Machine Learning

To start we will try to train a model that will correctly predict this set.

Code 1: Data Set

```
float train[][2] = {
    {0,0},
    {1,2},
    {2,4},
    {3,6},
    {4,8},
    {5,10},
}
```

If we think of the left value in each row as the input and the right as the output. The astute would notice a pattern.

$$\text{output} = 2 \times \text{ input}$$

We can turn this into a **mathematical equation:**

$$y = wx$$

Where, $w = 2$

Goal:

Our Goal is the create a model, that will train on the data to find w. As a result it will be able to predict future the outputs given an input.

2.0.1 Method

To train the model we it needs a method for the model to produce numbers, then we will create a lost or cost function (1.2) to assess how accurate the model's guess is.

For this simple example we will create a function that makes random guesses

Code 2: Random Function in C

```
// rand_float produces a random number between 0 and 1
float rand_float(void) {
    return (float) rand() / (float) RAND_MAX;
```

```
4 }
5
6 int main(){
7     //srand(time(0));
8     srand(12);
9 }
```

`srand()` is a way to adjust the random see that is used by `rand()`. If the value inside `srand()` is constant the seed will remain constant, and therefore then random number will not change every time it is run. To have a changing random number we can use `time(0)` a function that produces the current time.

`srand(time(0))` will consistently produce random seeds which in turn will produce random numbers in `rand_float()`

In the case of training we will limit the seed to 1 seed so we can provide a constant value within `srand(12)` 12 as an example