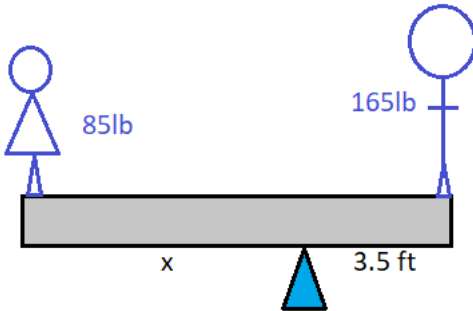Simple ML example

The teeter totter shown is in equilibrium. What is the distance, x? Neglect the weight of the beam.

Moment

Consider a body on which a force is applied, the moment on the body is determined as the product of the force applied, and the position where the force is applied. The moment is also known as torque.

Analytical solution is simple:

The formula for the moment about point A is,

(w1 × x) − (w2 × 3.5ft) = 0

Here, the weight of the girl is w1 and the weight of boy is w2.

Substitute the given values.

(85lb × x)−(165lb × 3.5ft) = 0

x= 577.5lb·ft / 85lb

  =6.79ft

Thus, the distance x is 6.8 ft

Problem restated as a Machine Learning Model:

Now, assume we don't know the above equation, but we have some idea how to approximate the relationship between the other person's weight and the distance x. This approximation (called a model) can have many forms. A simple math formula for linear equation will do the trick: $x = a_1 w_1 + a_0$

Download the sample Excel spreadsheet to get you started.

The spreadsheet has your weight, and the distance your sit on the teeter-totter, and most importantly the sample measurements that were collected from real life experiments.

Complete the highlighted columns – use equations so you can recompute everything pretty quick.

Questions:

- what is the model
- what are the mode's parameters
- how is learning accomplished
- what defines the relationship between the collected measurements and model's guesses
- which model parameters made the closest model predictions to the measured data