# [PS] Probability and Statistics Learnings of 2020-02-03~09

### What are random variables?

Functions. Variables that are determined by the actual outcome.

It's like Schrodinger's box, but it has a probability distribution.

### What is expectation?

The average value of a random variable given many independent experiments.

Another interpretation is of the average value of a population.

Sum of the probability or weight \* value. For all possible values.

### What is the linearity of expectation?

A linear change in expectation is equal to the expectation of the linear change. i.e. if it's linear, then you can switch the order of execution of expectation and linear functions.

E[g(x)] == g(E[x]) but this only holds for linear equations.

E[x^2] != (E[x])^2