Assesments in Education

Differentiated instruction using machine learning

Ben Trey

Differentiation in Education

Differentiation means the ability to adapt instruction and assessment to an individual student

Traditionally a teacher could separate a class into smaller groups and give individual attention to each group.

In the future data taken from the student will allow algorithms to create an individualized instruction and assessment on the individual level.

A Simple Way to Differentiate

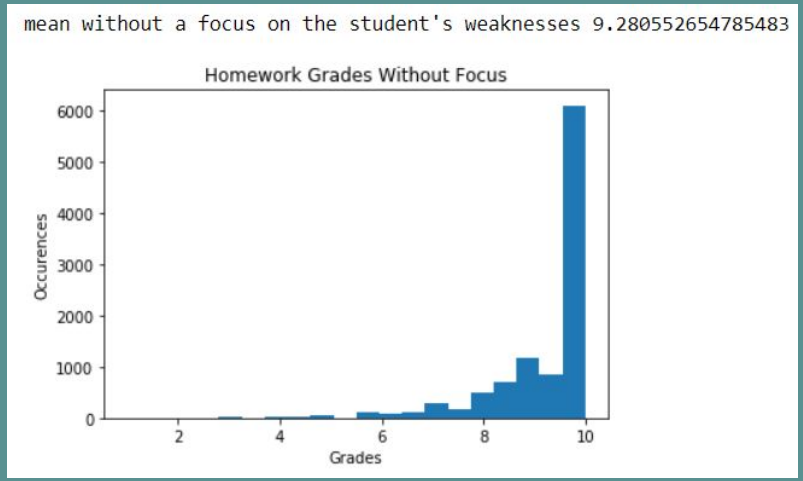
Give students problems that focus on their weaknesses.

This commonly occurs in traditional education in the form of test corrections, or additional exercises on topics the students don't understand such as review packets.

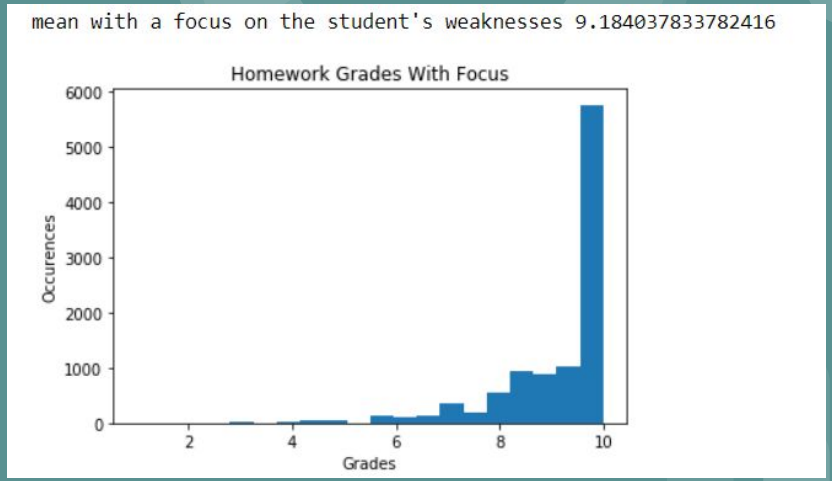
Using an automated system a simple algorithm to focus on a student's weaknesses would be to record the problems they got wrong and give given them problems in the future that review these concepts.

Performance of the Simple Algorithm

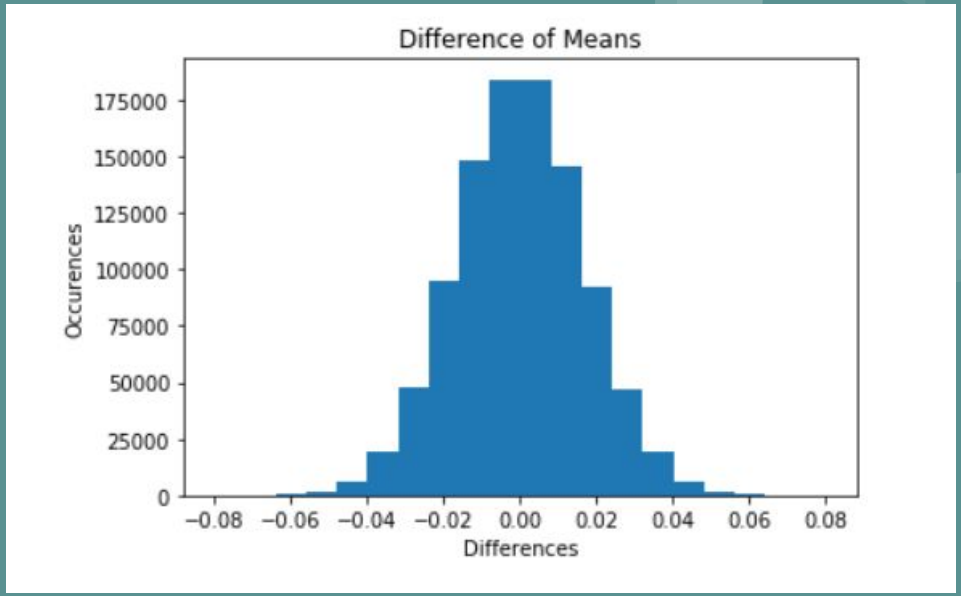
mean without a focus on the student's weaknesses 9.280552654785483



mean with a focus on the student's weaknesses 9.184037833782416



Distribution of Dataset Differences



The Simple Algorithm Performs Worse than Random Assignment

Students using problems sets that focused on the problems they got wrong previously performed worse in mid-course and end of course assessment. They also learned at a slower rate.