OFFICE OF DIGITAL LEARNING

Putting It Into Action: Auto-grading & Adaptive Hinting

Subject Number: **6.0001 & 6.0002**
Instructor: Ana Bell
Course Name: Introduction to Computer Science

Overview

In MIT courses 6.0001 and 6.0002, Digital Learning Fellow Ana Bell implemented MOOC-based interventions in order to facilitate quicker student comprehension and reduce the TA grading burden.

Ana Bell, MITx Digital Learning Fellow, Electrical Engineering & Computer Science

Educational Challenges

Problem: How to reduce the hours TAs spent grading without sacrificing grading accuracy or responsiveness to coding complexities?

Solution: Bell used the auto-grader for problems with structured, one-dimensional answers. If the student got the answer correctly, chances were strong that his or her code was correct. 30% of the problems fit this profile and by using the auto-grader on them, Bell was able to reduce TA grading hours by over 100% and thereby leave more time for manual grading of complicated questions for which there was a range of possible correct answers.

Problem: How to provide personalized feedback to common student pitfalls and misunderstandings?

Solution: With the help of a graduate student, Bell designed an automated feedback system that identified common pitfalls in student code and responded with suggestions and prompts customized to an individual student's error. Such suggestions could be, for example, a reminder to re-initialize a loop, or pointing out that the student was incrementing over and over again without re-setting. This automated feedback system is in its experimental phase but it shows promise for future iterations of the course.

Key Take-Aways

Through identifying common pitfalls and providing immediate feedback, auto-grading and adaptive hinting is tailored to common student errors. This, in turn, frees up TA time to give personalized attention to more complicated problems.

If you are interested in using the concepts from this case study in your teaching, please contact MITx Residential to speak with a consultant.