Retiring the Red Pen: Marking Exams Digitally

Hassan Khosravi and Donald Acton {hkhosrav,acton}@cs.ubc.ca
Department of Computer Science, University of British Columbia

Introduction

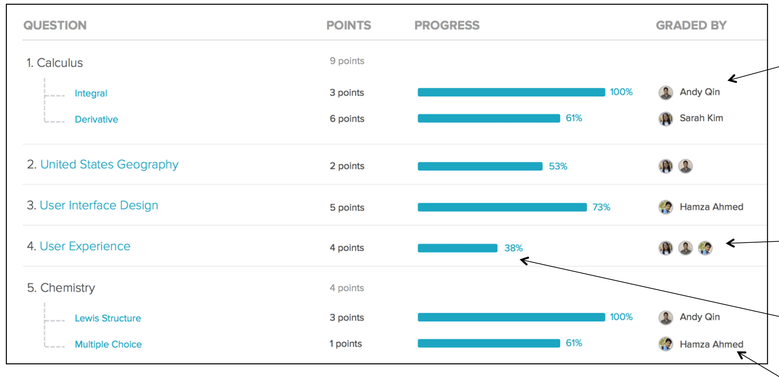
Over the last several years members of the Computer Science department have been marking exams, scanning them, recording grades using optical character recognition, and then returning online digital copies to students. This has greatly decreased the amount of time spent handing back exams and recording marks. With the advent of cloud-based software like Gradescope and Crowdmark two of us decided to switch the workflow and load scanned exams into grading software and then marked them online. During the 2015W2 term we collectively marked over 1500 exams (including group exams), across 3 courses (APSC 160, CPSC 313, and CPSC 317) utilizing over 30 TAs.

Procedure/Workflow

1. Create the exam as normal.
2. Add a special cover page. For privacy purposes this cover page associates the exam with a student and provides a unique student identifier for the grading system. This page is not uploaded to the grading system, thereby keeping student information confidential.
3. Print the exams and have students write the exam.
4. Scan the exams and upload to grading system.
5. Grade the exams using the online system.
6. Match exams to unique student identifier from 2.
7. Download a digital version of the marked exam.
8. Electronically handback marked exams.
9. Download grades.
10. Import grades into your gradebook.

Although there are some additional steps associated with using these systems, there are offsetting time savings. For example, the time to scan the exams is probably ½ to ¼ of the time needed just to enter the grades.

Benefits



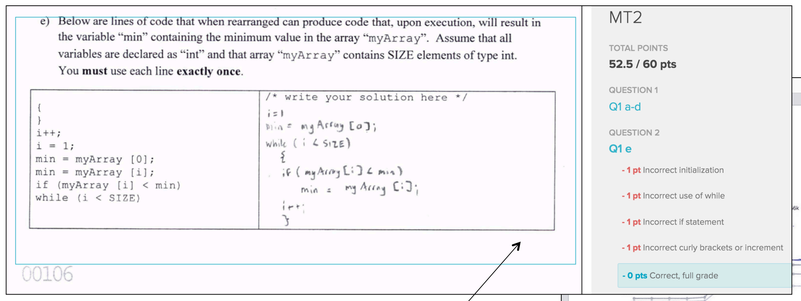
Easier to handle exam logistics and no more moving exam piles around

Provide flexibility with respect to location and time of marking

Easier to hold TAs accountable for their work

Easier to manage resources

Ability to estimate the contribution of each TA

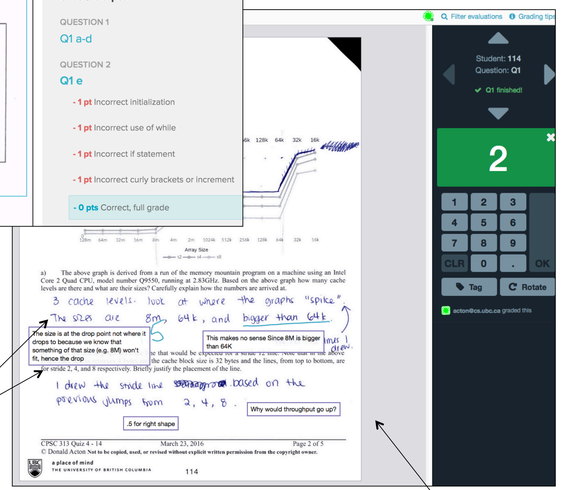


Our TAs were more excited and enthusiastic about marking. They don't want to go back to marking on paper.

Change the marking rubric on the fly

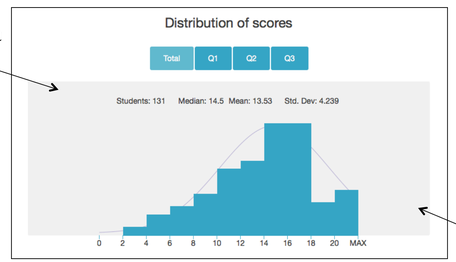
Exams are completely anonymous to marker

Improves/promotes grading consistency



Easier grade entry process

Provides a rich data log for analysis



Simplifies handling of regrade requests

Keep a digital copy of all the exams

Easier and faster to provide detailed feedback for students

Return a digital copy of the marked exam along with exam and question statistics without sacrificing lecture or lab time

Comparison

	Gradescope	Crowdmark	Exam Scanning
Changing the marking rubric on the fly	★	☆	
Estimating the contribution of each TA	★	☆	
Handling regrade requests	★	★	★
Promotes grading consistency	★	☆	
Richness of generated data for analysis	★	☆	☆
Richness of provided feedback	★	★	
Speed of providing feedback	★	★	☆
Convenience in returning the exams	★	★	★
Flexibility in time and location of marking	★	★	
TA engagement in marking	★	★	
Exams can't be altered after being returned	★	★	★
Resource Management/ Marking Logistics	★	☆	
Maintaining the anonymity of students during marking	★	★	
Grade Entry	★	★	★

How to Get Started

1. Access to the grading system. Gradescope is free while Crowdmark charges a fee, but it is easy to get free access, at least for a while, at UBC.
2. A scanner to produce jpeg or PDF files. Department photocopiers often already do this. The CS department uses a dedicated scanner that scans 2500 double sided pages an hour. You can do about 325, 15 page exams in an hour.
3. Laptops, desktop computers, or tablets to do the marking on.