



SEMI-AUTOMATING FEEDBACK OF FORMATIVE AND SUMMATIVE PROGRAMMING ASSIGNMENTS

Dr Malte Ressin

School of Computing and Engineering

The problem

- Class sizes of 300+ students
 - *Lucky I had only had 150 students*
- For programming-centric modules, assessment deliverables are often comprised of
 - *Code/programs*
 - *Report*
- I will be focussing on marking the code work here

The problem

- The programming part of such an assessment could look like this:

“Write a program that calculates the ordered union of two sets that it receives as input.”

- For example:

- *Input* [3, 1, 5], [6, 2, 4]

- *Output* [1, 2, 3, 4, 5, 6]

- A student submission might look like this:

```
merge_123 :: Ord a => [a] -> [a] -> [a]
merge_123 xs [] =xs
merge_123 [] ys = ys
merge_123 (x:xs) (y:ys) | x <= y =:merge_123 (x:xs) ys
| otherwise = y:merge_123 (x:xs) ys
```

Reading program code

- Highly repetitive
- Difficult to judge from looking at it
- Best way to evaluate is to run it!
 - *Tedious*
 - *Time-consuming*
- Automated test (aka Unit test):
 - *Define list of input with known output*
 - *Check if code solves input correctly*

What went well

- Reduced cognitive load
- Clear feedback
- Full automation
- Works well with rubrics
- Easy to operationalise/measure results
- Good opportunity to program myself

What went not so well

- Additional interface requirements, e.g., file and identifier names
 - *How to handle submissions that don't run at all, don't conform to interface requirements?*
 - *Additional work making student submissions work*
- Assignment needs to be through through well
- Still have to look at the code:
 - *Feedback "why" code doesn't work*
 - *Plagiarism*
 - *Checking coding style, annotations, etc.*
- Doing any of this wrong can quickly *increase* effort.

Where to go from here

- Student numbers in SCE are rising
 - *IMHO assignment automation definite way to go*
- Solution was homebrewed
- Proper integration into Blackboard
- Interactive system for students with immediate feedback
 - *Submission format*
 - *Syntax errors*
 - *Grade?*