

Midterm Grading Notes

ECS 20 – Fall 2021 – Phillip Rogaway

Each of the 30 questions was worth 10 points, so 300 points in all. Most scores were either 10 (fully correct) or 0 (otherwise), but I did give *some* partial credit. Problems were auto-graded except for **18, 19, 20, 22, 23, 28, 30**. For problems **17** and **25** there were some problem with the Canvas auto-grading that I had to fix by hand.

Make sure to fully understand a problem before asking for a regrade of it. I went over all problems in class for lectures 6M and 6T; please make sure you understand what was said then *before* making a regrade request. Then,

- ❖ If you understand a problem and believe you got it **fully correct**, but on the exam but did not get full credit for your solution, then please send me an email with your name and the problem number(s) that you want regraded. No explanation is necessary or desired; just point where you want me to look again. Make the subject heading of your email: “ECS 20: Midterm regrade request”.
- ❖ If your solution is **not** fully correct and you just think you should have gotten more points than I gave you, then this is almost certainly not a bug, but just the way I graded. In that case, please don't send an email.

I reserve the right to regrade in a downward direction, particularly if it the request seems clearly outside of what's written above.

Problem-specific grading notes

- **17** // rising sequences
I accepted 4 or 5 as answers (I had only entered in 4 to Canvas, because I failed to see the duplicate entry, a typo, in the sequence I gave you).
- **18** // rewrite $P \leftrightarrow Q$ with AND, OR, NOT
Quite a few people didn't read the directions. But most got one of the two natural solutions.
- **19** //what's a t.a.?
Many people failed to indicate that a truth assignment (t.a.) is a **function**. I wanted you to make that clear, and to make explicit what was the **domain** and **co-domain** for this function. Some people spoke of truth tables—again not on-track. Many people seemed to think that a t.a. has something to do with the formula ϕ getting assigned True—some people even demanding that it come out True—and lots of folks spoke of the way that we recursively extended truth assignments to operate on WFFs (after defining a t.a. to operate on propositional symbols). In fact, that last thing was so common that I must share some blame; next time, I will make sure to use a different symbol for a t.a. and it's extension (although keeping the old symbol is actually the norm). What I was really

looking for was a clear description of what a t.a. actually **is**, the **kind of object** that it is. It is **just** a function from the variables to \mathbb{B} . There was also a lot of garbled notation on this one—stuff like $t: \phi \rightarrow \{T,F\}$... and worse.. Please make sure you understand that that what I just wrote meaningless. When writing $t: \phi \rightarrow \{T,F\}$ you are indicating that t is a function with domain ϕ . But ϕ is not even a set—how could it possibly be the domain of a function? Do recall that I introduced a different kind of arrow, \mapsto , if you ever want to indicate what a particular point maps to under some understood function. So it would be “grammatical” to write $x_1 \mapsto \text{True}$ under t , or $\phi \mapsto \text{False}$ under the extension of a t.a. t , but it would not be quite right to write something like $x_1 \rightarrow \text{True}$ under t (although not everyone is so fastidious).

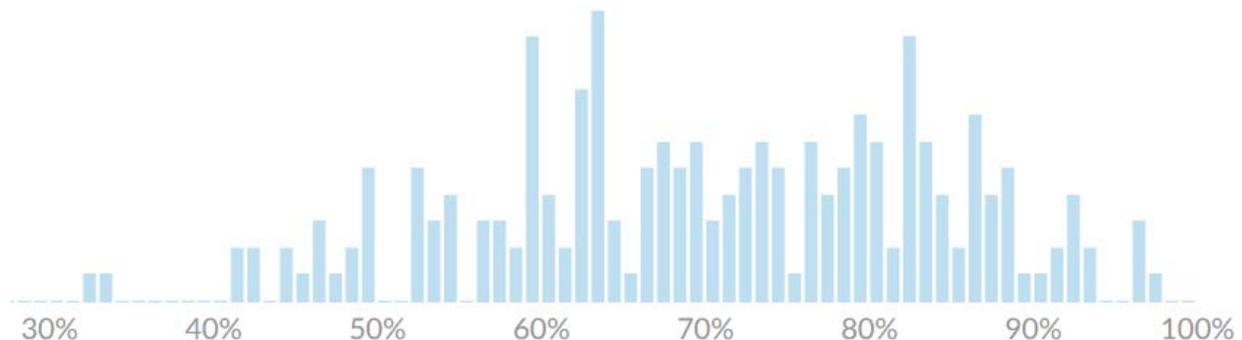
- **20** //completeness theorem
A few people confused the completeness theorem with logical completeness. That’s totally understandable. But wrong. A few people confused completeness with soundness, or with compactness.
- **22** //Russell’s paradox
Lots of answers weren’t in coherent English. Many of these speak about x -values and don’t make all clear that the problem arises from looking at the status of s itself, the set we have just attempted to define. As a final comment, many people can’t seem to distinguish an s from an S . I let that slide if everything else was good.
- **23** //Ordered triple
A fairly large number wrote mathematical gibberish. A few people defined it as what I said it is *not*: $(A \times B) \times C$.
- **25** // First four strings of some language
I had to go in and give credit if you had spaced things with different spacing than the answer key. Canvas *is* annoying!
- **28** //equivalence relation: $x \sim y$ when $|x| = |y|$
I was looking for you to say Yes and to at least *name* the three things one needs to check. I didn’t really care to see work of your checking those three things.
- **30** //injective
It was not enough to tell me that it is injective: you should justify this by naming a **specific** pair of colliding domain points, or telling me that x collides with $-x$ for every nonzero real number x .

Overall statistics

208 students took the exam. The range of scores was 100 to 293 (so 33% to 98%), with a mean grade of 213 (71%). That’s probably a few points higher than usual, probably an artifact of (10, 0, 0) True-False grading for (right, wrong, no-answer) — as opposed to my usual (10, -10, 0) way of grading True-False questions, which Canvas can’t handle.

One surprise was how long the students took. The majority of students took the whole 100 minutes, or something close to it. I believe this means that the test was longer than the TAs or I anticipated. At least that's what I *hope* it means, as the other natural explanation is worse.

Can you believe that Canvas does not report the median or standard deviation? The former is the "best" statistic if one has but one.



Final comments

I did all grading myself, grading entire exams one after another until I was done. This contrasts to the more common approach where you do one problem at a time, usually different people taking different problems. I have always felt that the first approach values students more. It can introduce biases (is it advantageous to be graded early, late, or in the middle ... before lunch or after lunch ...), and it probably takes longer, but it lets you see each exam as a sample of work, while the second approach inevitably results in seeing an exam as k piles of n piles of problems to get through.

I hope my first go at an online exam wasn't a flop. My impression was that it worked out fine apart for some Canvas-specific grading limitations. Those I can overcome by switching to Gradescope. I thought that spending a class period for going over the exam was a better way to spend a class than using a class for the exam itself.

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