

PGT Exam Performance Feedback

2018/2019 Semester 2

COMP60332 Automated Reasoning and Verification

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Comments Due to a School-wide policy change, this year there was no choice in the questions. Both questions needed to be answered. This adjustment did not cause any problems, because we had an excellent group of students this year! Of those who sat the exam we saw an increase in the overall average.

Question 1

Generally this question was answered well.

(a) i),ii), iii) Most students answered this correctly. iv) existence of a minimal element does not guarantee that the ordering is well-founded.

(b) most answered correctly.

(c) some students did not know how to express equivalence in terms of satisfiability.

(e) some have problems during lemma construction.

(d) some students mentioned only one difference between structural and syntactic CNF transformations.

(f) some problems with semantics of LTL formalisms.

(g) problems with symbolic representation of sets of states/transitions.

(h) those who attempted mostly answered correctly, some explanations did not cover both bounded model checking and k-induction.

Question 2

This question had an average mark of 70%. Of the 5 students who attempted the exam, 3 students had first class marks, one just missed first class and one just missed the 50% mark. The best mark was 25 which was achieved by two students.

(a) Avg 65%. Students coped well with this question, although nobody got full marks. Everyone got either 2 or 3 out of 4. Everybody got i) right. Most either had a mark deducted for wrong quantifiers, unclear bracketing and an \wedge instead of a \rightarrow in iii).

(b) Avg 60%. In each one mark was given for a correct answer and a correct explanation.

i) was meant to be easy, but some did not write anything.

ii) A few noticed the clauses can be resolved to produce the empty clause, so the answer is false.

iii) This was the hardest sub-question, but 1 student got it right.

iv) Everybody got full marks.

(c) Avg 80%

i) Posed no problems. Everybody got full marks.

ii) Everybody identified the tautologous clause, and almost everyone the subsumed clause. For one clause one can use the definition of redundancy to show that it follows from other clauses which are smaller.

iii) Most got this right. A common mistake was to patch the interpretation despite the current clause being true in the interpretation constructed so far.

(d) Avg 72%.

This required a non-trivial resolution derivation to be given and various properties about it to be identified. Only one student gave a correct derivation. The first step is a resolvent between clause 1 and 2. Most got that right but variable renaming is needed. Most made a mistake when resolving the obtained clause with 2 in the unification. This allowed the empty clause to be derived. But the set is satisfiable. Credit was given to correct subsequent steps and answers.