

UG Exam Performance Feedback

Third Year

2017/2018 Semester 1

COMP36111 Advanced Algorithms 1

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Comments This was a relatively straightforward paper, on which the majority of Candidates obtained good marks. One Candidate aced the exam (with 100%), and quite a few Candidates aced individual questions---especially question 1. Regrettably, however, there was a significant tail of Candidates who seemed to have lost touch with the material.

1. This question was done well, with most Candidates displaying a good knowledge of the Ford-Fulkerson method (flow maximization) and the Gale-Shapley algorithm. Oddly enough, parts a) and e) were among the worst. It was astonishing, for instance, how many Candidates could recite the Gale-Shapley algorithm by heart and yet not define a stable matching properly.

2. This question was less well done, with a rather low average. Some candidates answered part b) by writing out the Tarjan algorithm for strongly-connected components. This gained full marks only for those Candidates who clearly stated how this answers the question in the case of a cyclic directed graph. In part c), many Candidates gave a deterministic algorithm running in log-squared space: not what was asked for. In part d), many Candidates thought that "k" in "k-sat, stands for "Krom". There were a reasonable number of good attempts at e). Parts f) and (g) were well done by those who had not simply given up by that point.

3. Many brave souls tried part a) using a standard Linear Programming algorithm---grinding through the calculation until the solution was reached. A fair number also got the right answer: optimal value of 26 reached at $x = 9$ and $y = 8$. Easier by far, however, was to use a graphical approach, since the lines defining the first two inequalities have an obvious intersection at $x = 9$ and $y = 8$. A quick sketch of the remaining inequality and the gradient of the objective function easily shows that this must be the optimum. Candidates who gave a roughly correct graphical sketch or set out the simplex algorithm properly but then made an arithmetical slip got at least half marks.

Most Candidates who attempted the remaining parts seriously showed a good level of understanding. Surprisingly well done was part d), where there were many full and accurate answers.
