COMP26120 Algorithms and Imperative Programming

David Rydeheard
Joshua Knowles
Milan Mihajlovic

Comments

Q1 The question consists of two parts. The first part was based on the coursework and the examinable lab, while the second part required creative thinking and to connect the knowledge from the graph theory and knapsack optimisation. Most of the students have done the first part (the pseudo code of Dijkstra's algorithm with generalisations and the application of the algorithm to a concrete example). Most of the lost marks in this part were associated with not applying a systematic procedure (not drawing the content of a priority queue and the operations on it). In the second part there were some quite clever answers, and some of the students have got the right ideas. This question was taken by 149 students and the average mark was 70-75%.

Q2.150 Students attempted Question 2
The question was answered well overall - the mean and median mark were 13/20=65% and the mode was 17/20. One student achieved a score of 20/20.

Parts (a) the 0/1 KP problem, and (b) Greedy method, were generally answered well with most students achieving 6/7 or 7/7 as a total for the two.

Part (c)(i), which asked about a Branch and Bound upper bound, was also answered correctly by most students. Part (c)(ii), which asked for all partial solutions with an upper bound of 550 was answered poorly by comparison. Very few students found all six answers, most got only two or three, and some answered with only one. For good answers overall, this is where most marks were lost.

Part (d), which asked for a DP solution to an integer knapsack problem, the quality varied quite a lot. Most who attempted it got 3/7 or above; the marks were lost for mistakes in the DP table and for a poor explanation of the method used to fill out the table.

Q3 This question consisted of two examples of inserting a set of keys in a hash table (collision handling with linear probing), and into an AVL tree, and a pseudo code for finding an element in a binary search tree (including the complexity of this algorithm). The students did remarkably well in all parts, with a few marks lost mainly due to small miscalculations of the hash function or incorrect trinode rotations in the AVL tree. This question was taken by 121 students with the average mark >75%.

Q4,(Tree traversal techniques)

This question was answered by c55% of the students.

Most of the question consisted of explaining coursework - especially lectured material: 14 out of 20 marks went on coursework.

Although a number of students got very good marks (15/20 or above), many had very poor marks (below 8/20). It is clear from the scripts that many students had not engaged with the material. Lecture turnout was poor, and students had not bothered to revise the material. Many simply guessed at the answers - and got zero as a result. The final part on using priority search to solve a word puzzle had some interesting solutions proposed by those who attempted it. Any reasonable ideas towards a solution got good marks.

Because of the large number of poor answers, the overall average for this question was very low: 41%.