3HO4 Heuristic optimisation
Extra task 2018 - Feedback

For the majority of essays, there were no major problems. Students explored the topics beyond the lecture notes. However, about 3 of the essays were concerning and barely passed. The good essays were well structured, clear and within the specified page length. Most of the essays combined theory with examples. One student linked the topic to real world applications which showed a really good understanding. The topics covered and the general comments about the essays are given below.

Topics covered

Algorithms

- **Greedy algorithm**

  - Basic ideas, concepts and history of this algorithm
  - Applications and examples.

- **Ant colony algorithm**

  - Description of the analogy between the mathematical model and an ant colony.
  - Pheromones and heuristics.

- **Particle swarm optimisation**

  - Basic ideas, concepts and history of this algorithm
  - Applications to real problems.

- **Branch and bound**

- **Artificial neural networks**

Specific problems

- **Travel Salesman problems(TSP)**

  - Origin of this problems.
  - Algorithms applied for this problem such as greedy algorithm.

- **Three Partition Problem**

  - Origins and formulation of this problem.
  - Greedy algorithm for this problem.

- **Huffman Codings**

- **Course arranging problem**

- **Bin Packing problem**

Other comments and recommendations

- In general the essays were well structured with clear headings and sections. A range of interesting topics were considered and students showed how the theory from Heuristic optimisation can be applied to real world problems. Well done!

- It is okay to use ideas from other documents but use your own words in an essay written by yourself, and clearly cite the source where you have taken the information from. One student has copy-pasted a paragraph from a website without any reference, which is really bad. Don't do that again!

- Unfortunately many papers were not referenced properly. Several papers had no reference list at the end. Some of them did provide reference but in a wrong format. Please do not use Wikipedia in your reference because it is not a reliable source for reference.

- A few essays have shown that the students have good LaTeX skills. Most students wrote their essay by Microsoft Office. Two students submitted hand writing papers. We would like to encourage all students to use LaTeX in the future.

- A few students' essays consisted of just one section and many subsections. It is not a good format. Although it is a small essay, it is still necessary to separate it into several sections, so that the reader can follow your ideas easier.

- Be consistent with the names used throughout the document.

- Read your essay before submitting it, because you might spot several grammatical mistakes. You are writing a mathematical paper and text should be written in clear English with care taken to ensure spelling and grammar are correct. Some students need to improve their English writing skills. Don't put both "we" and "I" in the same paper.