

COSC 341 – Assignment 3

Presentation on May 20, 1pm, Report Due: May 25, 4pm

- Assignment 3 is aiming to enhance the understanding of NP-completeness and reduction skills.
- This assignment counts for 10% of your final mark. Marks will be determined by the overall goodness of your group presentation (5%) and report (5%). Each group (1-3 members) should have a group leader who is responsible to coordinate the problem selection, allocate tasks, and submit assignment report. Please form your group by yourselves, or you can choose to work by yourself.

Description of Assignment 3:

1. Search for an **NP-complete** (e.g. from google, or library books), which is not shown in lectures or tutorials. Problems that were shown or will be shown in lectures or tutorials are listed in the end.
2. Show that the selected problem is NP-complete by
 - (a) 5-10 mins group presentation (5%) on May 20 to present
 - What is the problem?
 - How to prove its NP-completeness?
 - (b) write the details in the report (no more than 3 page, 5%) submitted by the due time. Please submit the report by email to: yawen@cs.otago.ac.nz with subject 341 Assignment 3. Make sure that names and ID numbers of all group members are in the email (pdf or photo copy of hand-writing are acceptable).

Problems that have been shown or will be shown in lectures or tutorials include: Boolean satisfiability problem (SAT), Fair Division, Graph Colouring, Hamiltonian path problem, Travelling salesman problem, Subset sum problem, Clique problem, Vertex cover problem, BIN PACKING, Multiprocessor Scheduling Problem, channel assignment problem, exam assignment problem, Knapsack problem, Makespan Scheduling problem, Chip-packing problem, Board Packing problem, Storage Compactification problem.

To avoid conflict, please email (yawen@cs.otago.ac.nz) to check the problem before you start to work on that problem.