Department of Computing and Information Systems

COMP90038 Algorithms and Complexity

Mid Semester Test, Semester 1 2016

Student Number:

Tutorial (Day/Time):

Test Duration: 40 minutes.
Reading Time: 5 minutes.
Marks Available: 20 marks.
Length: This paper has 2 pages including this cover page.
Authorized Materials: None.

- Calculators are not permitted.
- Mobile phones are not permitted.
- Textbooks and other written material are not permitted.

Instructions to Invigilators: Students will write all of their answers on this test paper. Students may not remove any part of the test paper from the examination room.

Instructions to Students: This paper counts for 10% of your final grade. All questions should be answered in the spaces provided on the test paper. You may make rough notes, and prepare draft answers, on the reverse of any page, and then copy them neatly into the boxes provided.

Q1:	Q2:	Q3:	Q4:

Check list of concepts to be mastered before the mid-semester test:

- compare the order of growth of functions (see tutorial and quiz questions)
- determine the time complexity of a given algorithm, stating your final answer using Big O / Θ (see tutorial questions and Q1/Q2 on the assignment)
- write an algorithm to solve a particular array processing problem (e.g. Q3 on the assignment)
- write/trace a brute force string searching algorithm (see tutorial question)
- state the time complexity of particular sorting/searching algorithms (see lecture notes)
- trace the path of a particular sorting/searching algorithm (see tutorial and quiz questions)
- explain when you might elect to use a particular sorting/searching algorithm
- trace the path of QUICKSELECT algorithm (see tutorial question)
- explain graph concepts and representation (see tutorial question and definitions from lecture notes)
- trace the path of a particular graph traversal algorithms (see tutorial and quiz questions)
- write an algorithm to solve a particular graph processing problem (e.g. counting nodes/vertices; something similar Q4 on the assignment; also see tutorial questions)

Note: all material introduced in the lectures in Weeks 1 - 5 is examinable on the mid-semester test