CS091M4041H-2015: Final Examination

Notice:

1. Please write your name along with student ID, and label **CS** or **non-CS**;
2. There are 9 sections in the sheet, and for sections 1-7, you can arbitrarily choose one problem. If you answer two problems, say 1.1 and 1.2, the higher mark will be chosen;
3. When you are asked to give an algorithm, you should describe your algorithm in natural language or pseudo-codes, prove the correctness, and analyze time complexity;
4. You can write answers in either Chinese or English.

1 Divide and Conquer

(CS: 9 marks; non-CS: 7 marks)

1.1

1.2

2 Dynamic Programming

(CS: 9 marks; non-CS: 11 marks)

2.1

2.2

3 Greedy Algorithm

(CS: 9 marks; non-CS: 7 marks)

3.1

3.2

4 Linear Programming Formulation

(CS: 9 marks; non-CS: 12 marks)

4.1

4.2

5 Network Flow Formulation

(CS: 9 marks; non-CS: 12 marks)

5.1

5.2

6 NP-completeness Reduction

(CS: 9 marks; non-CS: 7 marks)

6.1

6.2

7 Approximation Algorithm

(CS: 9 marks; non-CS: 7 marks)

7.1

7.2

8 Bonus 1

(CS: 8 marks; non-CS: 8 marks)

9 Bonus 2

(CS: 8 marks; non-CS: 8 marks)