CS612 Assignment Hints

Institute of Computing Technology,
Chinese Academy of Sciences, Beijing, China

January 26, 2010

Assingment 1:

Problem 1:

True. Consider the process of the proof for the Stable Matching Problem Algorithm. w will never dump m.

Problem 2:

True. If (m, w) doesn't belong to S, m and w will hook up.

Problem 3:

You can use the analysis method like the one in the ppt.

Problem 5:

Analyze the cost like the one in the ppt, adding a redundant cost.

Problem 6:

It dosen't hold. Consider the case that it only consists of $MULTIPUSH$ operation.

Assignment 2

Problem 1:

Give a reduction from $2SAT$ to $PATH$.

Problem 2:

Give a reduction from $CLIQUE$. $CLIQUE$ is equivalent to $Independent-Set$.

Problem 3:

Give a reduction from $Subset-Sum$.

Problem 4:

Give a reduction from $Subset-Sum$.

Problem 5:

Give a reduction from $3SAT$. Each instance of $Half-3SAT$ will consist of many redundant clauses.

Problem 6:

Give a reduction from $Directed-Hamilton-Cycle$. Each instance will consist of 3 times of nodes of $Directed-Hamilton-Cycle$.

Problem 7:

Give a reduction form $3SAT$.

Assignment 3

Problem 1:

Compare the value of the median of the two database and combine half of the two database.

Problem 2:

Replace the combine process using the condition $a_i > 2a_j$.

Problem 3:

Search a path from root to a leaf, such that the label can decrease.

Problem 4:

Divide the graph into two graphs by a line. Construct a "zigzag" path for division.