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COMP 620 Final Project

MAX2SAT

Spring 2017

This MAX2SAT program used **greedy algorithm** and **local search algorithm**.

Greedy Algorithm:

Step 1: The program first reads all the variables (including negative variables) and then calculate the number of occurrences of each variable.

Step 2: Sort the variables by their occurrences count in decreasing order.

Step 3: Generate the initial truth assignment using greedy algorithm. From the variable with highest occurrences to lowest occurrences, assign the variable "true" if it is positive; assign its related positive variable "false" if it is negative. If the variable is already assigned a value, then keep the original value and go to next variable. Repeat this process until all the variables have been assigned a value.

Step 4: Using the initial truth assignment to calculate the number of true clauses, and this is the currently known best solution. The next step is to implement the local search algorithm.

Local Search Algorithm:

Step 1: Change one variable value and check if the number of true clauses increased under the new truth assignment. If yes, update the truth assignment to this new truth assignment and update

the currently know best solution; if no, go back to the previous truth assignment. After one variable was checked, change another variable value using the same method.

Step 2: Repeating this process until all the variables have been checked. If at least one better solution is found, check and change the value of each variable for one more time; if no better solution is found, terminate the local search algorithm.

Step 3: The final truth assignment and count of true clauses is the best solution we can find using this algorithm.