Hacettepe University
Department of Computer Science & Engineering
BiL236 Programming/Software Laboratory
Experiment III

Subject : Data Structures and Algorithms
Environment : Java (JAVAC 1.6.0_20 (Red Hat 4.1.2-50))
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I. INTRODUCTION

This experiment is designed to improve your skills on managing matrix structure and using search algorithms. You have to design a system that finds given words in a letter matrix.

II. PROBLEMS

Considers the following word list and given matrix and note the important points given below:

Word List: FIND, FORMAT, NARRATE, MARGIN

Matrix:

	0	1	2	3	4	5
0	F	I	N	D	C	E
1	O	T	A	H	O	F
2	R	O	R	N	T	I
3	M	A	R	G	I	N
4	A	X	A	L	U	D
5	T	W	T	M	S	E
6	A	F	E	O	K	D

1. There exists only upper case letters and Turkish special letters will not be used.
2. A word may be given more than one time in the matrix. (Such as “find” in the given matrix.)
3. Words will be given only from left to right and up to down ways.
4. A new column or row may be inserted to the matrix. Additions may be inserted to the end the matrix or insight to the matrix. It is also possible to remove columns or rows.
5. Word list is also extendible. The arrangement of the list is also important. You have to put the new words to the end of the list.
6. Note that the index of the both column and rows are started from zero.

III. I/O FILE FORMAT

The input file will contain the word list, matrix and the commands. The command list and responds are listed below:

FINDWORDS: Lists the all found word with starting coordinate. At the output file, the results have to be given at the word list arrangement. By the way you also have to give the direction of the word as horizontal or vertical. If there ant word exists more than one, than you will sort by row, column order. If the starting point of the words are the same, than you have to give vertical one first.

ADDWORDS <word-comma-list>: Adds the given new words to the word list.

REMOVEWORD <word-comma-list>: If the given word exists in the list, then remove the given word from list.

ADDCOLUMN <start-point> <letter-list>: Add a new column to the given start point. If start point given 2, then the new column will be the indexed 2 and remaining columns will be shifted to the right.

REMOVECOLUMN <column-number>: Removes the given column.

ADDROW <start-point> <letter-list>: Add a new row to the given start point. If start point given 2, then the new row will be the indexed 2 and remaining rows will be shifted to the down.

REMOVEROW <row-number>: Removes the given row.

PRINTMATRIX: Writes the matrix to the output file.

PRINTWORDS: Writes the word list to the output file.

The input file may contain some incorrect lines. If any line contains some incorrect information, you have to omit that line. The file format of the output file is also very important. You have to obey all rules, or automatic verification process will fail. You may put a blank line after all results written to the output file. The new line and space characters will be removed at he automatic verification process.

IV. LAST REMARKS:

All laboratory rules are also applied for this experiment. You can use standard java libraries. Your report will be graded over 40 points. There has to be class diagram in your report.