Joint Regional CE EGEE and SEEGRID-2
Summer School on Grid Application Support
www.egee.hu/grid06

Description of the “Matrix operations” program

This program is a sequential C program which can performs *one* matrix operation from 8 different matrix operations. The operation can be selected by command line parameters. *Depending on the selected operation the program reads one or two matrix(es) from input files called INPUT1 and INPUT2. The program always generates one result matrix in a file called OUTPUT.*
Both the input and the output files are plain ASCII files and describe one matrix in the following format:

```
Number of rows, number of columns, matrix elements
```

For example the following input/output file

```
2 3 1.1 1.2 1.3 2.1 2.2 2.3
```

represents the matrix:

1.1	1.2	1.3
2.1	2.2	2.3

Use a Web broser to download the executable program and two sample input matrix files from the following address:

http://jfe.lpds.sztaki.hu/~sipos/p-grade/matrix/

The program can be controlled by command line attributes having maximum 3 parameters:

<Operation_code> [<Extension>] [V[erbose]]

(An obligatory operation code, a possible extension and an optional V flag.)

In verbose mode the program writes its input matrix(es), the selected operation and the result matrix to the standard output (the result matrix is written into the file “OUTPUT” too).

The supported matrix operations are the followings:

Operation	**<Operation_code>**	**<Extension>**	Description
Add	A		INPUT1 + INPUT2 → OUTPUT
Substruct	S		INPUT1 – INPUT2 → OUTPUT
Multiply	M		INPUT1 * INPUT2 → OUTPUT
Reverse Multiply	R		INPUT2 * INPUT1 → OUTPUT
Transpose	T		Transpose of INPUT1 → OUTPUT
Constant multiply	C	A floating value	Floating value * INPUT1 → OUTPUT
Line of	L	An integer value	selected line of INPUT1 → OUTPUT
Column of	C	An integer value	selected column of INPUT1 → OUTPUT

e.g. to multiply the INPUT1 and INPUT2 matrixes into an OUTPUT matrix the program must be started as:

`./matrix_operations M` or **`./matrix_operations M V`**