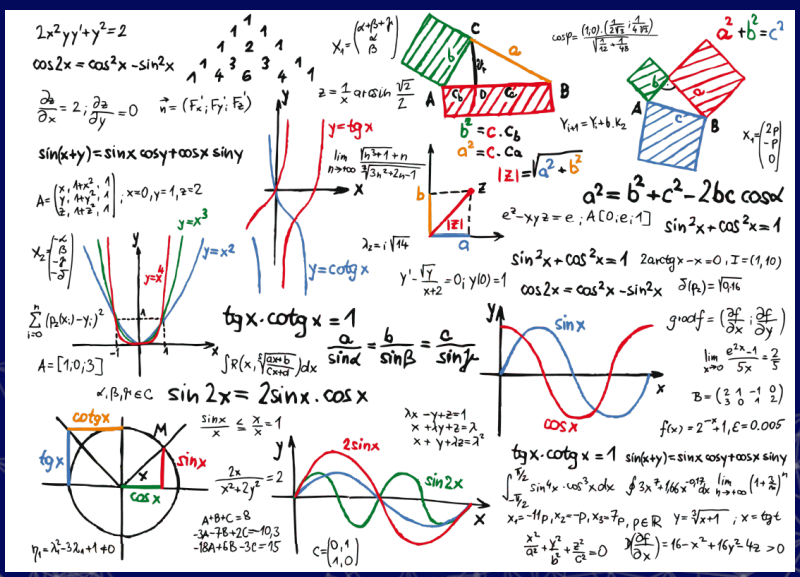
{EPITECH}
LEARN DIFFERENT*

108TRIGO

FURTHER FIDDLING WITH FANCY FUNDAMENTAL FUNCTIONS



108TRIGO

binary name: 108trigo
language: everything working on “the dump”
compilation: when necessary, via Makefile, including re, clean and fclean rules

- ✓ The totality of your source files, except all useless files (binary, temp files, objfiles,…), must be included in your delivery.
- ✓ All the bonus files (including a potential specific Makefile) should be in a directory named bonus.
- ✓ Error messages have to be written on the error output, and the program should then exit with the 84 error code (0 if there is no error).

As you may know (or not), the exponential function can be written as the sum of a power series:

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!} = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$

So does many other functions, such as trigonometric and hyperbolic functions.

These power series are extremely handy when it comes to fast approximations of all those functions. But they can also be used to exponentiate (for instance) mathematical objects (as long as they can be elevated to integer powers). One could for example compute the cosine of a function, the exponentiation of a graph, the hyperbolic tangent of a rotation or the sine of a square matrix (which is what you will do here)…

Given a matrix and the name of a function, your program must apply the latter to the former, and print the result.

Matrices are given as arguments line by line.

Obviously, matrix-managing libraries are not allowed. Hopefully, you already wrote efficient functions to compute matrix powers!

Usage

```
Terminal
~/B-MAT-200> ./108trigo -h
USAGE
    ./108trigo fun a0 a1 a2 ...

DESCRIPTION
    fun     function to be applied, among at least ‘‘EXP’’, ‘‘COS’’, ‘‘SIN’’, ‘‘COSH’’
            and ‘‘SINH’’
    ai      coeficients of the matrix
```

Examples

```
Terminal
~/B-MAT-200> ./108trigo COS 4 5 9 3 3 5 0 1 9
0.70    -0.43   -1.94
-0.16   0.67    -1.23
-0.06   -0.15   0.07
```

```
Terminal
~/B-MAT-200> ./108trigo EXP 1 2 3 4
51.97   74.74
112.10  164.07
```

```
Terminal
~/B-MAT-200> ./108trigo SINH 1 0 2 0
1.18    0.00
2.35    0.00
```

Coefficients are split by tabulations.

v 3.1