

PROGRAMMING



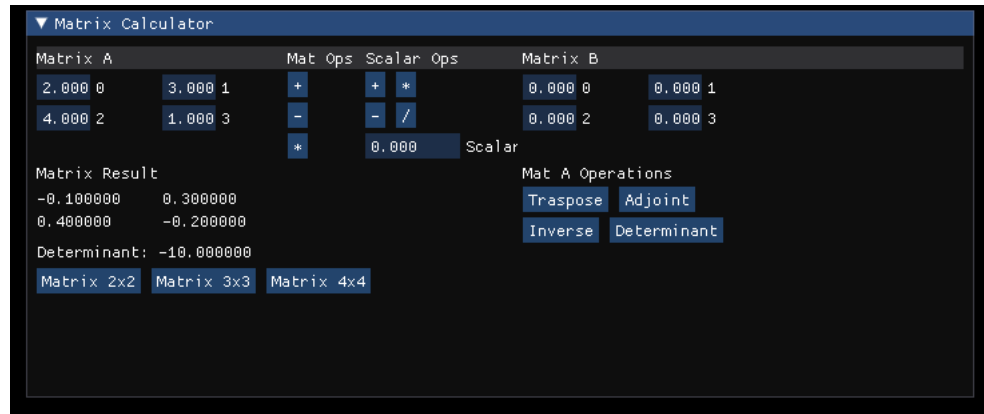
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1.- Algorithms.

An algorithm is a set of sorted instructions that implements a solution to a problem or to realize a task. The practice implements an algorithm to quickly calculate matrix and vector operations.



The example shows the result of a matrix 2 inverse. Without a matrix calculator that automatizes the process, and immediately return the result of the desire operation, the calculation of a matrix 2 inverse will take much more time. This simple algorithm increases the efficiency and productivity when we need to calculate determinate operations quickly.

The programming algorithms are usually the previous phase to the code. Generally, the algorithm is written first to find the solution, and later through the code, indicate to the computer what actions must realize to execute the implemented algorithm.

2.- Programming paradigms.

1.1 Procedural Programming.

This paradigm is built around the idea of procedures, that are routines or functions that executes a set of instructions. These procedures generally consist in a determinate code that is repeated during the execution of the program, and is encapsulated inside the procedure, heavily decreasing the size of the code, without affecting the performance.

Procedural programing is used for the database queries and the graphical implementation of the calculators.

1.2 Object Oriented Programming.

This paradigm is based upon the concept of objects, similar to the concept of objects that interact with the real world. This objects contains the data in the form of attributes and the code in the form of methods. The main characteristics of the OOP is the inheritance of the objects, the encapsulation of the data, and the polymorphism.

The source code uses classes to encapsulate the data of the application used for the main loop of the program.

1.1 Event Driven Programming.

In this paradigm the flow of the program is determinate by events, such as inputs, outputs or even other program threats. The code in this paradigm is usually encapsulated inside a



main loop that is constantly listening and checking for events to occur, to trigger a call-back function when one of those events are detected.

The source code uses event driven programming to check the different operations of the calculators. When the user presses a button, the programs calls the respective function and outputs the result. All the source flow is allocated inside a main loop function.

3.- Implementation and Debugging

The IDE used for the project is Visual Studio 2019, essentially for debugging and compiling. Working with an IDE allows the developer to be more productive and decrease the development time. An IDE integrates all the necessary tools for creating software in a single program. Otherwise the developer will require different tools to do different task, decreasing its productivity.

The process of debugging in visual studio is very simple we just need to add breakpoints where we think or we are being notice that the problem is and then using the different options of the tool, we can easily check the values, change and memory of our application in execution time.

All the source code is written used the Google's normative for programming, which increase the productivity of the developers by sharing common writing practice in the code, allowing them to get a quickly understanding of what the code is doing, and what are the different variables and functions of the program and where they could find them.

4.- Post Morten.

Overall the project is a poor and insufficient work due to the bad organization. The transformations of the math library are not checked if they are correct or not. The calculators' layout is confusing and its functioning bothersome for the user. The database is almost not implemented or not implemented. Some classes are left unused due to the lack of time for the bad organization, plus the lack of classes. And I personally think that the code has memory leaks.