

# Arithmetic Operations on Sparse Matrices

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## 1 Introduction

This code was developed with the help of ChatGPT to conduct arithmetic operations on sparse matrices. Operations performed by the program include addition, subtraction, multiplication, and transpose. The program reads matrices in Matrix Market Format, and thus requires files with `.mtx` extension (these files are not provided).

## 2 How to use the program

1. Download all of the files in one directory.
2. Open the `main.c` file in VS Code.
3. In the terminal, ensure you are in the directory in which all of the files are located.
4. To compile the program, run the command `make` in the terminal.
5. To run the program, run `./main <file1.mtx> <file2.mtx> <operation> <print>` in the terminal. Make sure you use the correct `.mtx` files. `<operation>` can be either `addition`, `subtraction`, `multiplication`, or `transpose`. Please note that if you are computing `transpose`, both `<file1.mtx>` and `<file2.mtx>` should be the same file. `<print>` can either be a `0` or `1`, where `1` prints out all the matrices and `0` does not print anything.
6. To remove the executable from your directory, run the command `make clean` in the terminal.