

Session 5

Lab exercise description

Recomplete 2D Matrix Multiplication Task

Exercise description:

1. Last week we wrote some functions to receive two matrices from the user (A, and B) and we calculated $A*B$
2. This week we do exactly the same task, however with Object Oriented Programming mindset
3. You need to look at the `matrix.hpp` header file and see what functionalities are provided and how to use them
4. Then you need to complete the `main.cc` template.

Sample
output
(expected
behavior)



!./program

```
Enter the number of rows for Matrix A: 2
Enter the number of columns for Matrix A: 2
Enter values for the matrix:
Mat[0][0]: 1
Mat[0][1]: 2
Mat[1][0]: 3
Mat[1][1]: 4
Matrix A:
1 2
3 4
Enter the number of rows for Matrix B: 2
Enter the number of columns for Matrix B: 1
Enter values for the matrix:
Mat[0][0]: 3
Mat[1][0]: 7
Matrix B:
3
7
Result of Matrix Multiplication (C = A * B):
17
37
```

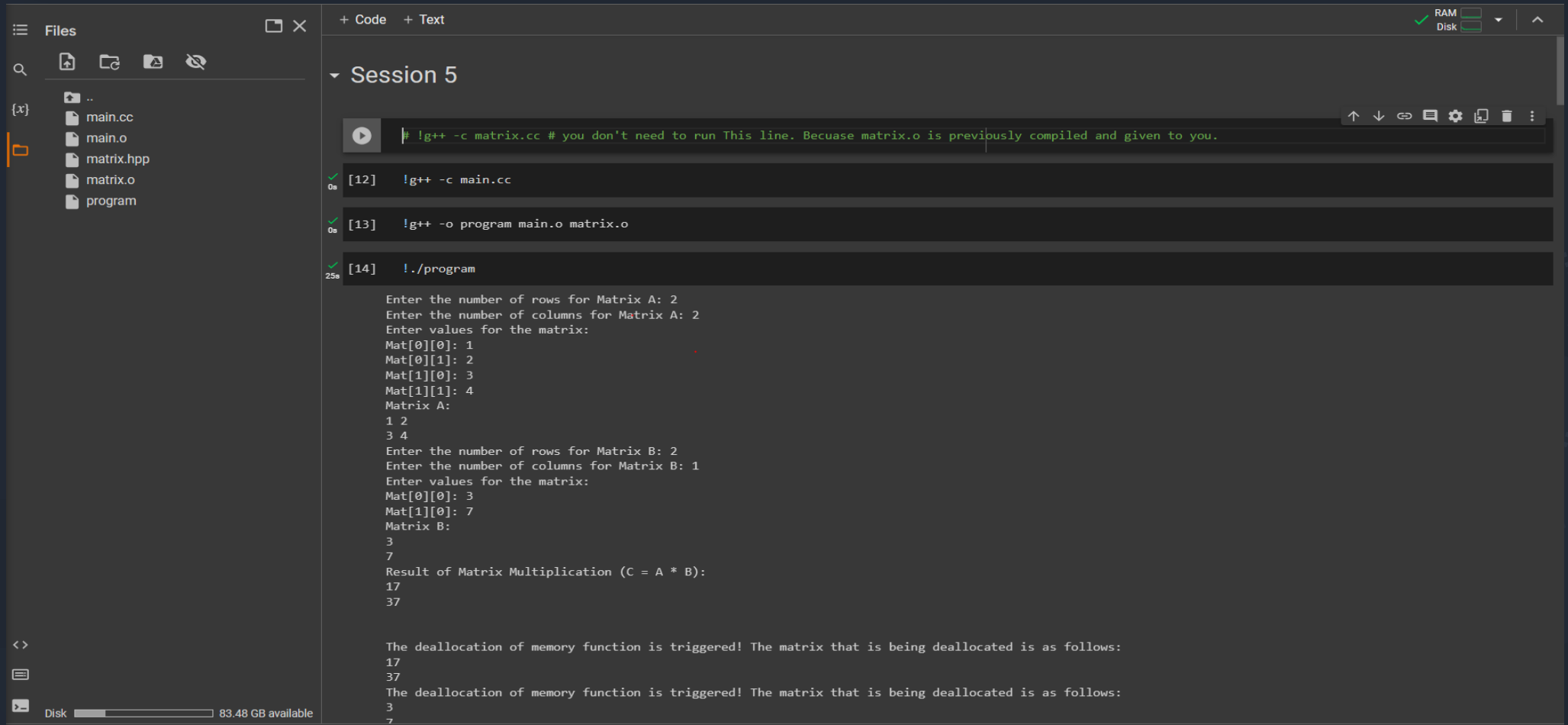
```
The deallocation of memory function is triggered! The matrix that is being deallocated is as follows:
17
37
The deallocation of memory function is triggered! The matrix that is being deallocated is as follows:
3
7
The deallocation of memory function is triggered! The matrix that is being deallocated is as follows:
1 2
3 4
```

Files that you are given:

1. Main.cc : This is the only file that you need to change. Use Matrix class in the header file to complete the main.cc
2. Matrix.hpp: This is a header file for the Matrix class which is implemented in matrix.cc file (note: You don't have the implementation of Matrix class, in other words, you don't have matrix.cc file).
3. Matrix.o : binary file resulting from "g++ -c matrix.cc". Don't open or change this file. You need this file in linking step

How to run the code:

1. Upload matrix.hpp and matrix.o files on Colab (don't change these two). Upload your completed main.cc file too.
2. Run the following commands:



The screenshot shows a Google Colab environment. On the left, the 'Files' pane displays a directory structure with files: main.cc, main.o, matrix.hpp, matrix.o, and program. The main workspace on the right is titled 'Session 5' and contains three code cells. The first cell is a comment: `# !g++ -c matrix.cc # you don't need to run This line. Becuase matrix.o is previously compiled and given to you.`. The second cell executes `!g++ -c main.cc`. The third cell executes `!g++ -o program main.o matrix.o`. Below these, the output of running the program is shown, including prompts for matrix dimensions and values, and the resulting matrix multiplication output.

```
+ Code + Text
RAM Disk
Session 5
[12] !g++ -c main.cc
[13] !g++ -o program main.o matrix.o
[14] !./program

Enter the number of rows for Matrix A: 2
Enter the number of columns for Matrix A: 2
Enter values for the matrix:
Mat[0][0]: 1
Mat[0][1]: 2
Mat[1][0]: 3
Mat[1][1]: 4
Matrix A:
1 2
3 4
Enter the number of rows for Matrix B: 2
Enter the number of columns for Matrix B: 1
Enter values for the matrix:
Mat[0][0]: 3
Mat[1][0]: 7
Matrix B:
3
7
Result of Matrix Multiplication (C = A * B):
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The deallocation of memory function is triggered! The matrix that is being deallocated is as follows:
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