Lab 4 debug report

There are two semantic bugs in the Matrix Matrix::copy() function. Breakpoints were set throughout this function. Below is the output after several breakpoints have been placed:

```
#starting testSetElementValid

#success testSetElementValid OK

#starting testSetElementInvalid

#success testSetElementInvalid OK

#starting testCopy

Breakpoint 1, Matrix::copy (this=0x68f6dc) at Matrix.cpp:205
205                     for(int j = 0; j < colsNum; j++)
(gdb) i locals
j = 4
i = 0
copy = {rowsNum = 3, colsNum = 3, matrixData = 0xf87f28}
(gdb) c
Continuing.

Program received signal SIGSEGV, Segmentation fault.
0x004062ba in Matrix::copy (this=0x68f6dc) at Matrix.cpp:206
206                         copy.setElement(matrixData[j][i], j, i);
(gdb) i locals
j = 4
i = 0
copy = {rowsNum = 3, colsNum = 3, matrixData = 0xf87f28}
(gdb) c
Continuing.

Program received signal SIGSEGV, Segmentation fault.
0x004062ba in Matrix::copy (this=0x68f6dc) at Matrix.cpp:206
206                         copy.setElement(matrixData[j][i], j, i);
```

```
(gdb) i locals
j = 4
i = 0
copy = {rowsNum = 3, colsNum = 3, matrixData = 0xf87f28}
(gdb) c
Continuing.

Program received signal SIGSEGV, Segmentation fault.
0x004062ba in Matrix::copy (this=0x68f6dc) at Matrix.cpp:206
206                              copy.setElement(matrixData[j][i], j, i);
(gdb) i locals
j = 4
i = 0
copy = {rowsNum = 3, colsNum = 3, matrixData = 0xf87f28}
(gdb) c
Continuing.
[Inferior 1 (process 2380) exited with code 030000000005]
(gdb) i locals
No frame selected.
(gdb) ▌
```

The first semantic bug is the result of how the matrix was passed to the setElement function. In both c and c++, the first term in square brackets is the row index, the second term is the column index. This line was the source of the second semantic bug.

```
206                              copy.setElement(matrixData[j][i], j, i);
```

The second semantic bug is that the copy function does not know how big to make the copied matrix. Each Matrix object needs to at least have its number of rows and number of columns. This line of code was changed:

```
201          Matrix copy = Matrix();
```

To this:

```
Matrix copy(rowsNum, colsNum);
```