

Introduction to Programming

with Java

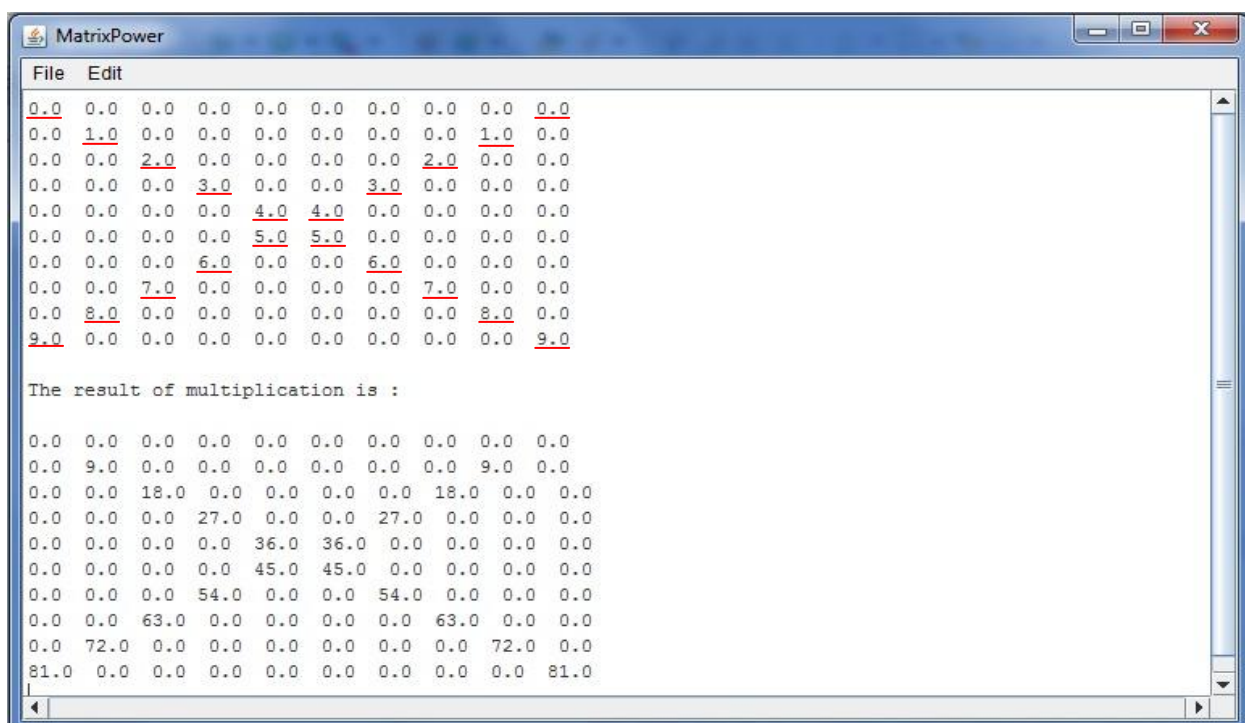
Class: **MatrixPower.java**

Score: ★★★★★ (Challenging)

Description:

Implement a program which uses a given `SparseMatrix` class to construct a two dimensional array in which all the elements of this array are zero except than the elements on the diagonal and anti-diagonal of the matrix (red underline in the sample run). The value of the matrix elements should be their diagonal rank. The program is supposed to print out the constructed matrix along with the result of multiplication of the matrix by itself.

Sample Run: (Please note that the red underline is only a means of emphasis and you don't have to implement non-zero matrix elements with that underline).



```
File Edit
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 0.0
0.0 0.0 2.0 0.0 0.0 0.0 0.0 2.0 0.0 0.0
0.0 0.0 0.0 3.0 0.0 0.0 3.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 4.0 4.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 5.0 5.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 6.0 0.0 0.0 6.0 0.0 0.0 0.0
0.0 0.0 7.0 0.0 0.0 0.0 0.0 7.0 0.0 0.0
0.0 8.0 0.0 0.0 0.0 0.0 0.0 0.0 8.0 0.0
9.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 9.0

The result of multiplication is :

0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 9.0 0.0 0.0 0.0 0.0 0.0 0.0 9.0 0.0
0.0 0.0 18.0 0.0 0.0 0.0 0.0 0.0 18.0 0.0
0.0 0.0 0.0 27.0 0.0 0.0 27.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 36.0 36.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 45.0 45.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 54.0 0.0 0.0 54.0 0.0 0.0 0.0
0.0 0.0 63.0 0.0 0.0 0.0 0.0 63.0 0.0 0.0
0.0 72.0 0.0 0.0 0.0 0.0 0.0 0.0 72.0 0.0
81.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 81.0
```