GENERAL SOLUTION

Ultimately we’re looking for 2k multiplications. Note that 2k = 2k - 1 \* 2k – 1. Each 2k-1 term may be further split into two sub-problems. Therefore, it is possible to construct a balanced binary tree with log22k levels which is just k. Each level only requires 1 multiplication to obtain the next level. Therefore, 2k may be calculated through k multiplications.

COMPILING & RUNNING

1) Extract all the files to any directory and cd to that directory

2) Type "javac EfficientMatrixMultiplication.java"

3) Type "java EfficientMatrixMultiplication input.txt DESIRED\_NAME\_OF\_OUTPUT\_FILE.txt"

For example "java EfficientMatrixMultiplication input.txt output.txt"