CMSC 412 - Homework 4 - Banker's algorithm

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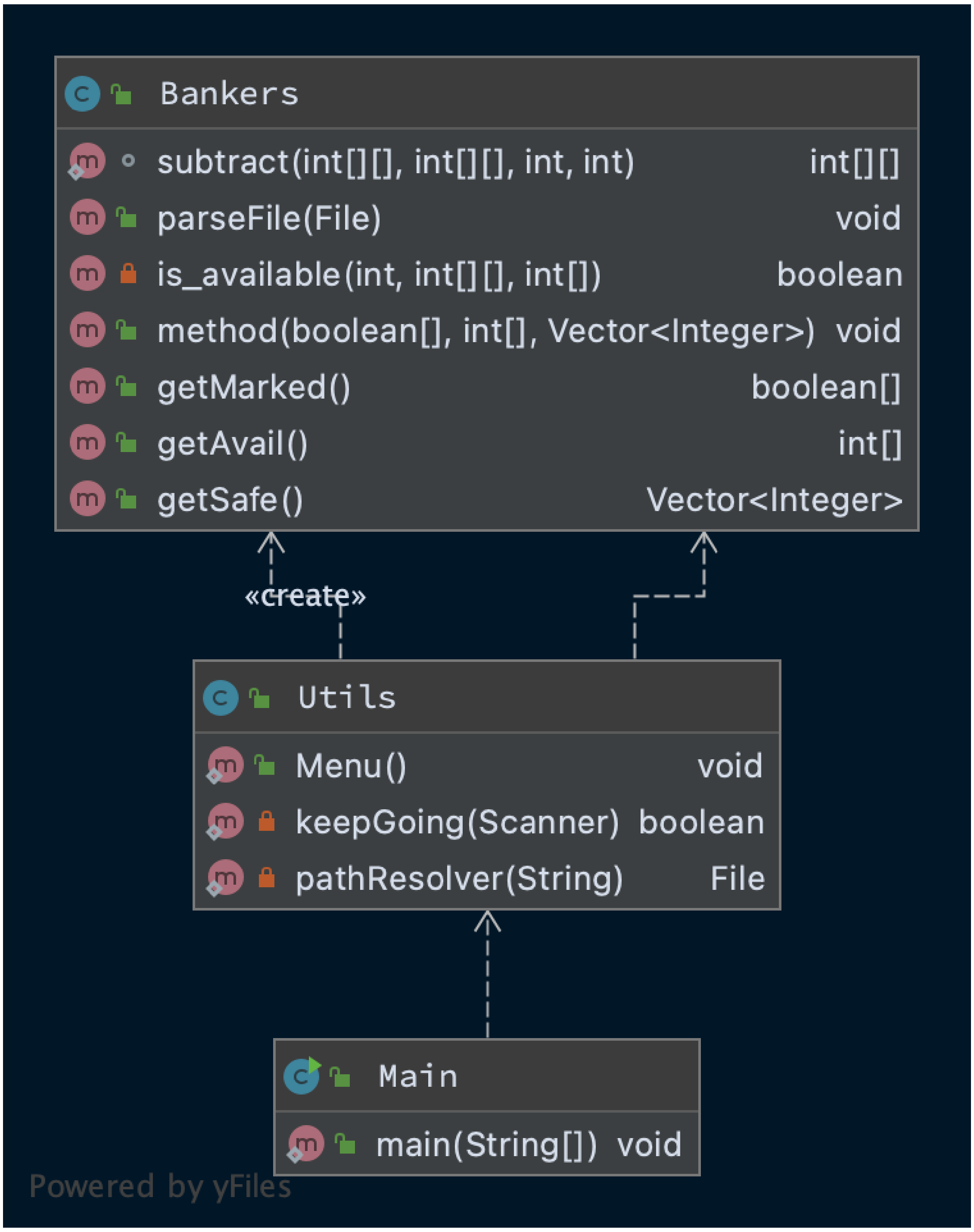
Description Implemented Banker's algorithm for deadlock avoidance. Using Java for the implementation, with a simple text interface, where the user enters only the name of the input file (text only). The program reads all the necessary input data from that file

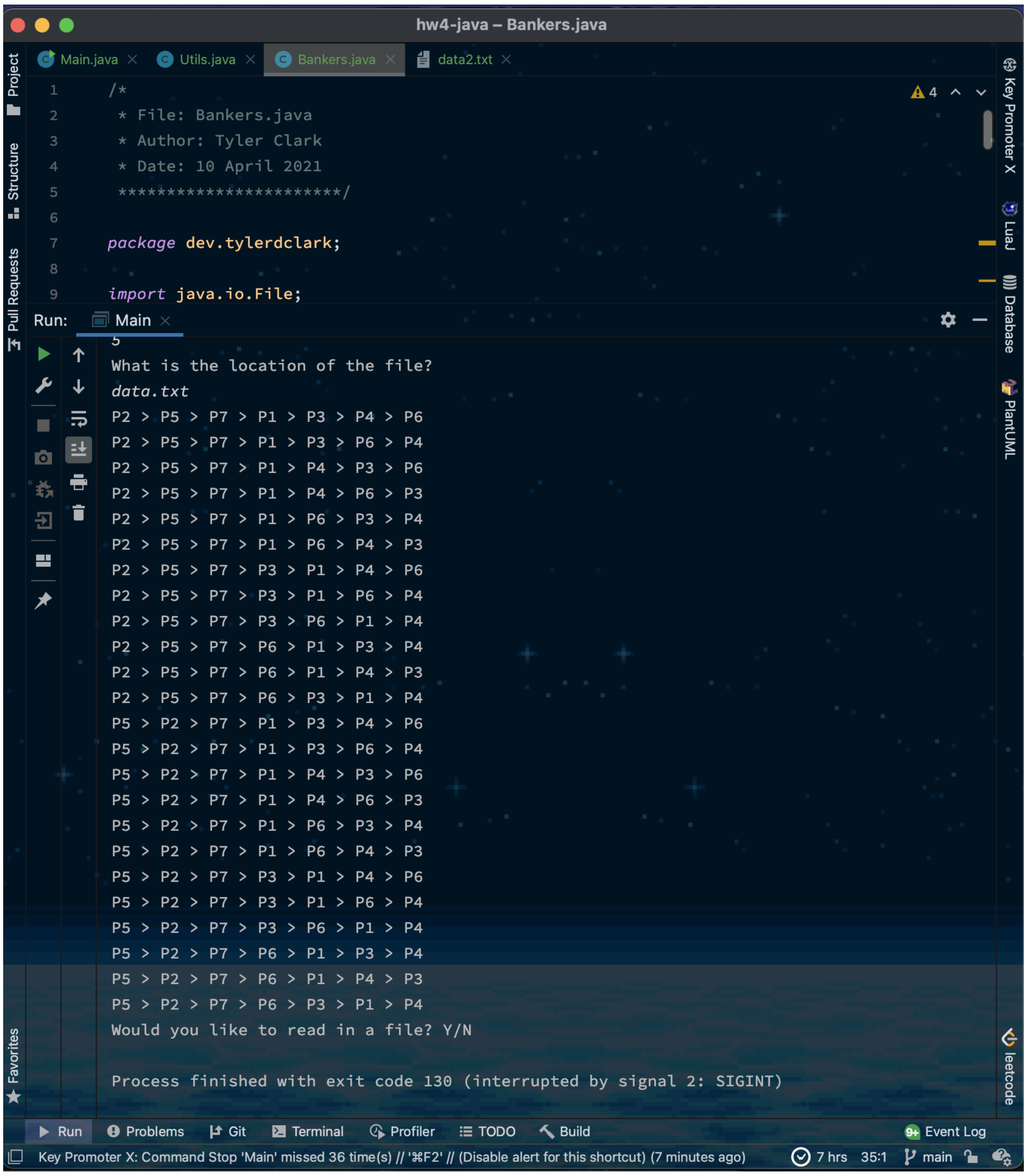
File Layout

```
.
├── doc
│    └── hw4.md
└── src
    └── dev
        └── tylerdclark
            ├── Bankers.java
            ├── Main.java
            ├── Utils.java
            ├── data.txt
            └── data2.txt
```

UML Diagram


Bankers
subtract(int[][], int[][], int, int) int[][]
parseFile(File) void
is_available(int, int[][], int[]) boolean
method(boolean[], int[], Vector<Integer>) void
getMarked() boolean[]
getAvail() int[]
getSafe() Vector<Integer>
«create»
Utils
Menu() void
keepGoing(Scanner) boolean
pathResolver(String) File
Main
main(String[]) void
Powered by yFiles

Screenshot:



```java
/*
 * File: Bankers.java
 * Author: Tyler Clark
 * Date: 10 April 2021
 ***********************/

package dev.tylerdclark;

import java.io.File;
```

```
5
What is the location of the file?
data.txt
P2 > P5 > P7 > P1 > P3 > P4 > P6
P2 > P5 > P7 > P1 > P3 > P6 > P4
P2 > P5 > P7 > P1 > P4 > P3 > P6
P2 > P5 > P7 > P1 > P4 > P6 > P3
P2 > P5 > P7 > P1 > P6 > P3 > P4
P2 > P5 > P7 > P1 > P6 > P4 > P3
P2 > P5 > P7 > P3 > P1 > P4 > P6
P2 > P5 > P7 > P3 > P1 > P6 > P4
P2 > P5 > P7 > P3 > P6 > P1 > P4
P2 > P5 > P7 > P6 > P1 > P3 > P4
P2 > P5 > P7 > P6 > P1 > P4 > P3
P2 > P5 > P7 > P6 > P3 > P1 > P4
P5 > P2 > P7 > P1 > P3 > P4 > P6
P5 > P2 > P7 > P1 > P3 > P6 > P4
P5 > P2 > P7 > P1 > P4 > P3 > P6
P5 > P2 > P7 > P1 > P4 > P6 > P3
P5 > P2 > P7 > P1 > P6 > P3 > P4
P5 > P2 > P7 > P1 > P6 > P4 > P3
P5 > P2 > P7 > P3 > P1 > P4 > P6
P5 > P2 > P7 > P3 > P1 > P6 > P4
P5 > P2 > P7 > P3 > P6 > P1 > P4
P5 > P2 > P7 > P6 > P1 > P3 > P4
P5 > P2 > P7 > P6 > P1 > P4 > P3
P5 > P2 > P7 > P6 > P3 > P1 > P4
Would you like to read in a file? Y/N

Process finished with exit code 130 (interrupted by signal 2: SIGINT)
```

Discussion

I first wanted to do this with C++, but I found that I was not quite ready for that! I did everything in C++ right up until the implementation of the banker's method. So, I switched over to Java and it was much easier to do. I initially wanted to brute force all of the safe process orders, but I was having some great difficulties. Through some research, I found that I was able to use recursion to solve this problem, so I did. I needed to keep track of which processes have been visited and also A vector was needed because it allowed index access and removal. Overall this was a big learning experience for me.