Extra Credit Programming Project 2

This is an extra credit project (not mandatory). If you successfully implement the program, you will get 3% ON TOP OF YOUR FINAL GRADE.

1. Introduction

Assume that you are asked to implement a part (module) of certain OS, which determines if the system is in safe state or unsafe state. For this, the module will use Banker's algorithm presented in the lecture note for Chapter 7.

2. Project Details

When you program starts, it must read the input file ("input.txt") that contains all the information about processes and system resources. By reading the input file, your program decides if the system is in safe state or unsafe state. In addition, if the system is in safe state, your program must display the sequence of processes that satisfies safety criteria

3. Input File Format

Input file format is as follows:

```
Number of Processes: 5
Number of Resource Types: 3

Allocation
0 1 0
2 0 0
3 0 2
2 1 1
0 0 2

Max
7 5 3
3 2 2
9 0 2
2 2 2
4 3 3

Total
10 5 7

Available
3 3 2
```

For the "Allocation" and "Max" matrices in the input file above, the row represents processes and the column represents resources. For the "Total" and "Available" matrices, the column represents resources.

4. Report

You are to provide a report named "report.txt" that should include:

a. Problem definition and proposed solution (how your program is implemented).
b. What are the results you got (in plain English, discuss the output of your system and **do not copy and paste the program output**)
c. All the bugs or problems known, any missing items and limitations of your implementation IF ANY. (honesty deserves additional points)
d. Any additional sections you see necessary

Please note that your reports (your program as well) MUST consist of your own sentences, if you have to copy anything from anywhere you have to quote it and provide reference point. Also a perfect program does not necessarily deserve full points if it is not complemented with a good report. A good report is a brief one that helps its reader understand the system thoroughly from the problem definition through the limitations.

5. Submission Guidelines

a. Only submit source code files. (NO object or project files)
b. Include your 1~3 page(s) project report.
c. Please compress your files to ".zip" format.
d. You must submit the zip file after logging into your blackboard account.

*** If plagiarism is detected (any small part of the code), the entire project portion of your final grade (25% of your entire grade) will be 0.