



**Faculty of Engineering  
Ain Shams University  
Electrical Department**

**Name: Alaa Shaaban Hussien Ali Shatat**

**ID: 1700271**

**Section: 1**

**Operating Systems \_Assignment**

**The Banker's Algorithm**

**Submitted to: Dr. Sahar Haggag**

**Cairo 2021**



## Contents

1. Screenshots of examples .....	3
1.1 Safe state enquiry .....	3
1.1.1 Example1 .....	3
1.1.2 Example2 .....	4
1.2 Immediate request enquiry .....	5
1.3 Immediate request enquiry without granting immediately .....	6
1.3.1 Example1 .....	6
1.3.2 Example2 “another process request” .....	6
2. Notes .....	7
3. Working files .....	7



## 1. Screenshots of examples

### 1.1 Safe state enquiry

#### 1.1.1 Example1

```
CA: Select C:\WINDOWS\system32\cmd.exe
Please enter your processes number
5
Please enter your resources number
4
Please enter your Allocation matrix
0 0 1 2
1 0 0 0
1 3 5 4
0 6 3 2
0 0 1 4
Please enter your Max matrix
0 0 1 2
1 7 5 0
2 3 5 6
0 6 5 2
0 6 5 6
please enter your available matrix
1 5 2 0
The need matrix is:
  R0  R1  R2  R3
P0 0  0  0  0
P1 0  7  5  0
P2 1  0  0  2
P3 0  0  2  0
P4 0  6  4  2
please to check if the system is in a safe state press 0, for immediate request press 1: 0
Yes, safe state <P0,P2,P3,P4,P1>
Press any key to continue . . .
```



### 1.1.2 Example2

```
C:\WINDOWS\system32\cmd.exe
Please enter your processes number
5
Please enter your resources number
3
Please enter your Allocation matrix
0 1 0
2 0 0
3 0 2
2 1 1
0 0 2
Please enter your Max matrix
7 5 3
3 2 2
9 0 2
2 2 2
4 3 3
please enter your available matrix
3 3 2
The need matrix is:
  R0  R1  R2
P0 7  4  3
P1 1  2  2
P2 6  0  0
P3 0  1  1
P4 4  3  1
please to check if the system is in a safe state press 0, for immediate request press 1: 0
Yes, safe state <P1,P3,P4,P0,P2>
Press any key to continue . . .
```



## 1.2 Immediate request enquiry

```
C:\WINDOWS\system32\cmd.exe
Please enter your processes number
5
Please enter your resources number
4
Please enter your Allocation matrix
0 0 1 2
1 0 0 0
1 3 5 4
0 6 3 2
0 0 1 4
Please enter your Max matrix
0 0 1 2
1 7 5 0
2 3 5 6
0 6 5 2
0 6 5 6
Please enter your available matrix
1 5 2 0
The need matrix is:
R0 R1 R2 R3
P0 0 0 0 0
P1 0 7 5 0
P2 1 0 0 2
P3 0 0 2 0
P4 0 6 4 2
Please to check if the system is in a safe state press 0, for immediate request press 1: 1
Please enter the process number:
1
Please enter the process request:
0 4 2 0
Yes request can be granted with safe state <P1req,P0,P2,P3,P4,P1>
Press any key to continue . . .
```



### 1.3 Immediate request enquiry without granting immediately

#### 1.3.1 Example1

```
C:\WINDOWS\system32\cmd.exe
Please enter your processes number
5
Please enter your resources number
4
Please enter your Allocation matrix
0 0 1 2
1 0 0 0
1 3 5 4
0 6 3 2
0 0 1 4
Please enter your Max matrix
0 0 1 2
1 7 5 0
2 3 5 6
0 6 5 2
0 6 5 6
please enter your available matrix
1 5 2 0
The need matrix is:
  R0  R1  R2  R3
P0 0   0   0   0
P1 0   7   5   0
P2 1   0   0   2
P3 0   0   2   0
P4 0   6   4   2
please to check if the system is in a safe state press 0, for immediate request press 1: 1
please enter the process number:
1
please enter the process request:
1 4 2 1
No, request can't be granted immediately
Press any key to continue . . .
```

#### 1.3.2 Example2 “another process request”

```
C:\WINDOWS\system32\cmd.exe
Please enter your processes number
5
Please enter your resources number
4
Please enter your Allocation matrix
0 0 1 2
1 0 0 0
1 3 5 4
0 6 3 2
0 0 1 4
Please enter your Max matrix
0 0 1 2
1 7 5 0
2 3 5 6
0 6 5 2
0 6 5 6
please enter your available matrix
1 5 2 0
The need matrix is:
  R0  R1  R2  R3
P0 0   0   0   0
P1 0   7   5   0
P2 1   0   0   2
P3 0   0   2   0
P4 0   6   4   2
please to check if the system is in a safe state press 0, for immediate request press 1: 1
please enter the process number:
4
please enter the process request:
0 6 3 0
No, request can't be granted immediately
Press any key to continue . . .
```



## 2. Notes

- Language used: **C++**.
- Each element in the matrix “while scanning” is separated with space.
- We get the number of processes and resources, allocation matrix, and the Max matrix. Then the need matrix is printed and the user can enquiry if the system is in a safe state or a certain immediate request by one of the processes can be granted. According to the user enquiry the required result will be printed.
- Input examples are provided in the working files

## 3. Working files

You can find the working files in the link below:

- <https://drive.google.com/drive/folders/1voZAI7a0clhlb7N3D3HgT74tkJV8dRn?usp=sharing>

Each one separately:

- Executable file:  
[https://drive.google.com/file/d/1--Vg\\_mpKahRn0wTA27dYNtfUk7MgfVpq/view?usp=sharing](https://drive.google.com/file/d/1--Vg_mpKahRn0wTA27dYNtfUk7MgfVpq/view?usp=sharing)
- Code files:  
<https://drive.google.com/file/d/16YnoFDKgv10sHe7lbKM0TleAm4LiK4kM/view?usp=sharing>
- Input examples:  
<https://drive.google.com/file/d/1dcA-ufQMztrtTbN4qLPLA5ALrRqT5ZYi/view?usp=sharing>
- Algorithm as a text file:  
<https://drive.google.com/file/d/1s0WH-y3PMHGANUSZ-6JRKNduuT3FZ9fc/view?usp=sharing>