

# *Banker's Algorithm*

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Operating Systems

## *Implementation*

'bankers-algorithm.cpp' reads in given process-resource tables for conducting the algorithm. These tables are read into respective 'vector<vector<int>>'' matrices: Allocation, Max, and Available.

The Allocation table represents the current resource counts of the processes. The Max table displays the max number of each resource the process will use. The Available table shows the current resource amounts.

A new matrix of Need is created off the difference between the Max and Allocation tables. This table explains how much of each resource the processes will require to be satisfied.

The program has a main iteration cycle. In each cycle, if the process has yet to be verified, it will have its needs reviewed with the Available table. If any of its resource requirements are not met, the cycle moves past. Given they are met, the corresponding Allocation of resources for the process is added to the current Available table, accumulating in resource inventory. This process is now finished, and the cycle continues.

At the end of the iterations (number of loops is determined by number of processes), if there a process has yet to be satisfied, the system is acknowledged as unsafe. On the other hand, if all processes are marked confirmed, then there exists a safe sequence of resource allocation and the system is deemed safe. The sequence is then output to the user in order of completion.

## *Example Output*

----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]

----Available----

[3|3|2]

There exists a safe sequence of:

P1 , P3 , P4 , P0 , P2