CSD204 - Operating System

Lalit Maurya, 2310110164

Question 01

```
~/devEnv/snu/CSD204-OS/lab07/src on  main ?1
❯ ./q01
Enter Allocation Matrix:
1 0 2
3 1 0
0 1 1
1 0 1
1 0 2
Enter Max Matrix:
6 5 3
4 2 1
5 1 2
1 0 2
5 2 3
Enter Total Resources:
7 5 7
Safe sequence is: P2 -> P4 -> P5 -> P3 -> P1
```

This program implements the Banker's Algorithm to check system safety and handle resource requests by processes.

Features:

- Accepts input for Allocation, Max, and Total system resources.
- Computes Available and Need matrices.
- Determines whether the system is in a safe state by calculating a safe sequence.
- Allows runtime resource requests by processes and checks if granting the request keeps the system in a safe state.

Question 02

```
 ~/devEnv/snu/CSD204-OS/lab07/src on  main ?1
❯ g++ q02.cpp -o q02 && ./q02
process size (bytes) > 4096
logical address bits > 16
main memory size (bytes) > 65536
page size (bytes) > 1024

-----Calculations-----
logical address bits > 16
page number bits > 6
page offset bits > 10
physical address bits > 16
frame number bits > 6
frame offset bits > 10
total pages in logical address space > 64
total frames in main memory > 64

enter a logical address to translate (0 to 4095): 1024
frame number > 15
physical address > 15360
```

This program simulates logical to physical address translation using paging.

Features:

- Takes inputs for process size, logical address bits, main memory size, and page size.
- Calculates:
  - Page number and offset bits
  - Frame number bits and physical address bits
- Randomly generates a page table.
- Accepts a logical address and translates it to a physical address using the page table.