Operating Systems Lab Assignment

Simulation of First Fit, Best Fit, and Worst Fit Memory Allocation in C

Objective: To implement and compare First Fit, Best Fit, and Worst Fit memory allocation strategies using the C programming language.

Problem Statement

Write a C program to simulate three contiguous memory allocation strategies: **First Fit, Best Fit, and Worst Fit**.

Consider the following memory blocks and processes.

Memory Blocks

Block Number	Block Size (KB)
B1	350
B2	120
B3	250
B4	400
B5	180

Processes

Process	Memory Required (KB)
P1	115
P2	300
P3	175
P4	390
P5	220

Tasks

1. Implement the First Fit algorithm to allocate each process to the first available memory block that can accommodate it.
2. Implement the Best Fit algorithm to allocate each process to the smallest available memory block that can accommodate it.
3. Implement the Worst Fit algorithm to allocate each process to the largest available memory block that can accommodate it.
4. Display the process number, process size, allocated block number, and remaining memory in the allocated block.
5. Display `Not Allocated` if a process cannot be allocated to any available block.
6. Calculate and display the total number of allocated and unallocated processes for each algorithm.
7. Compare the allocation results of all three strategies.

Programming Requirements

- Use arrays to store memory block sizes and process sizes.
- Implement each allocation strategy as a separate function.
- Each memory block can accommodate at most one process.
- Maintain a separate copy of the memory blocks for each algorithm.
- Accept memory block sizes and process sizes as user input.
- Process allocation must follow the given process order.

Expected Output Format

```
FIRST FIT ALLOCATION

Process   Size (KB)   Block   Remaining (KB)
P1        ...         ...     ...
P2        ...         ...     ...
P3        ...         ...     ...
P4        ...         ...     ...
P5        ...         ...     ...

Total Allocated Processes: ...
```

`Total Unallocated Processes: ...`
Generate similar output for **Best Fit** and **Worst Fit**.

Submission Requirements

1. Submit the C source code.

2. Include sample input and output for all three algorithms.