Presentation Topic :- Operating System of a Laptop : Type,Structure & Scheduling Algorithm

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Operating System Functions

Processes

Managing the execution of programs.

Memory

Allocating and managing memory resources.

Devices

Controlling input/output devices.

Files

Organizing and managing files and directories.

Types of Operating Systems

Batch OS

Processes are grouped and executed sequentially without user interaction. Suitable for tasks not needing real-time input.

Multiple tasks share CPU time, allowing concurrent user interaction. Improves responsiveness and supports multiple users.

Time-Sharing OS

Distributed OS

Multiple systems work together as a single, unified system. Enhances performance and reliability through workload distribution.

Designed for applications requiring fast, time-bound responses. Used in industrial control systems and medical devices.

Real-Time OS

General-Purpose OS

Operating systems like Windows, macOS, and Linux are designed for general use on laptops and desktops.

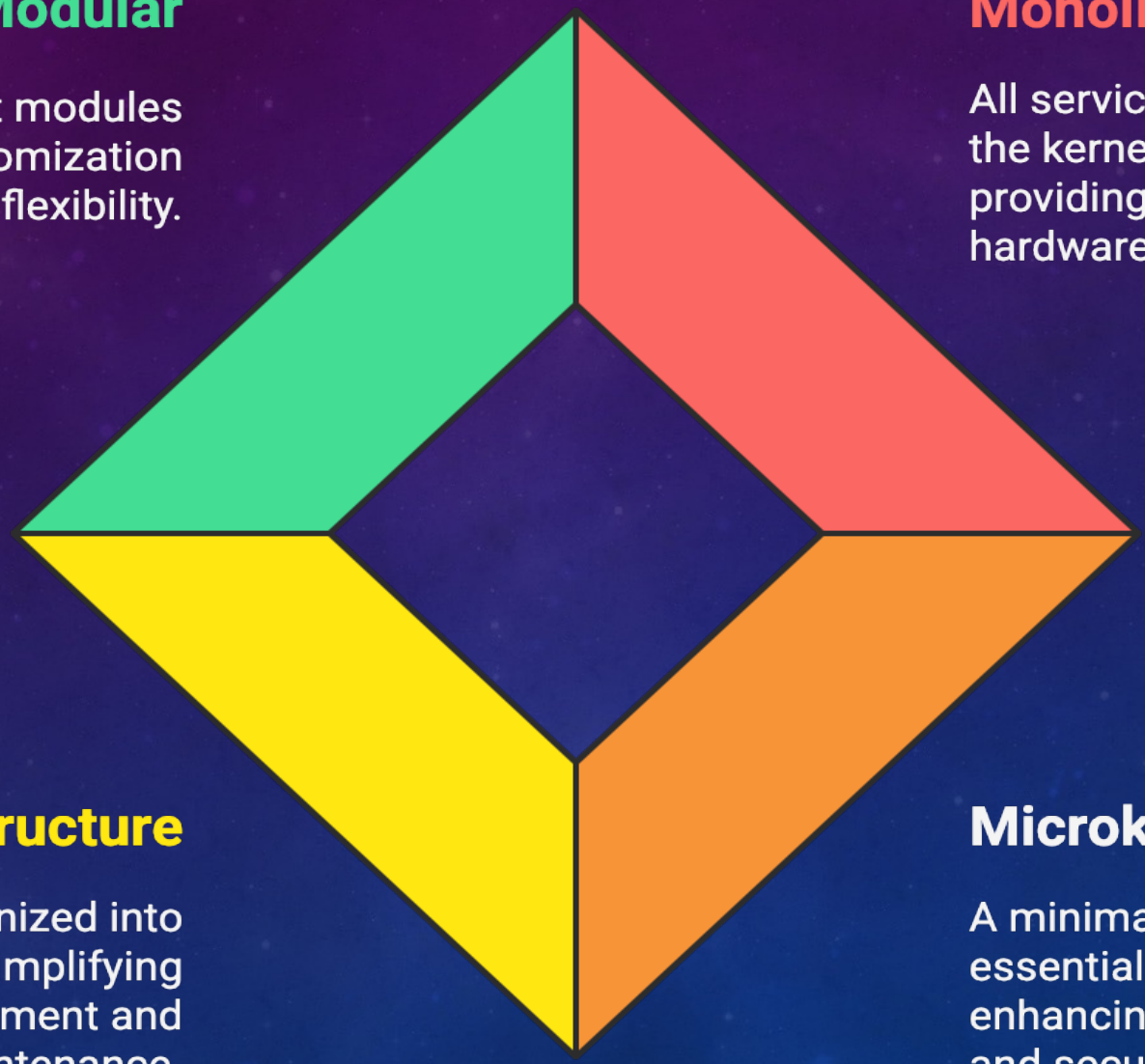
OS Architecture Foundations

Modular

Independent modules allow for customization and flexibility.

Monolithic Kernel

All services run within the kernel space, providing direct hardware access.



Layered Structure

The OS is organized into layers, simplifying development and maintenance.

Microkernel

A minimal core provides essential services, enhancing modularity and security.

Goals of Process Scheduling

Speed

Minimizing task completion time

Fairness

Ensuring equal CPU time for all processes

Efficiency

Maximizing CPU utilization and throughput

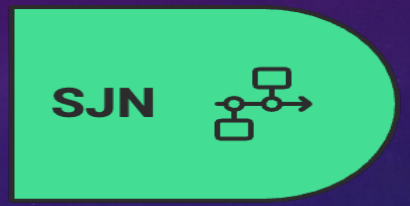
Responsiveness

Providing quick response times to user interactions

Process Scheduling Algorithms

Processes are executed in the order they arrive.

The process with the shortest execution time is executed first.



Each process is given a fixed amount of CPU time.

Processes are assigned priorities, and the highest priority is executed first.

Processes are divided into different queues based on their type or priority.

Operating System Schedulers

Windows

Prioritizes interactive processes for responsiveness.

Hybrid kernel ensures smooth multimedia performance.

macOS

Linux

CFS provides fairness and scalability for workloads.

Conclusion of Laptop OS