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Coimbatore- 49

DEPARTMENT OF COMMERCE WITH INFORMATION TECHNOLOGY

21UCI507 -Business Information Technology

Operating Systems

Mrs.M.Viveka, MCA., M.Phil., (Ph.D).,

Assistant Professor,

Department of Commerce with Information Technology

Operating System

- An Operating System (OS) is system software.
- It acts as an interface between user and hardware.
- Controls the working of a computer system.
- Without OS, computer cannot function.

Example:

Windows, Linux, macOS, Android

Operating System

Definition

"Collection of programs that manages computer hardware and software resources and provides common services for computer programs."

Key Points:

- Manages system resources
- Controls program execution
- Provides user interface

Main Functions of OS

- Process Management
- Memory Management
- File Management
- Device Management
- Security Management
- User Interface
- Control

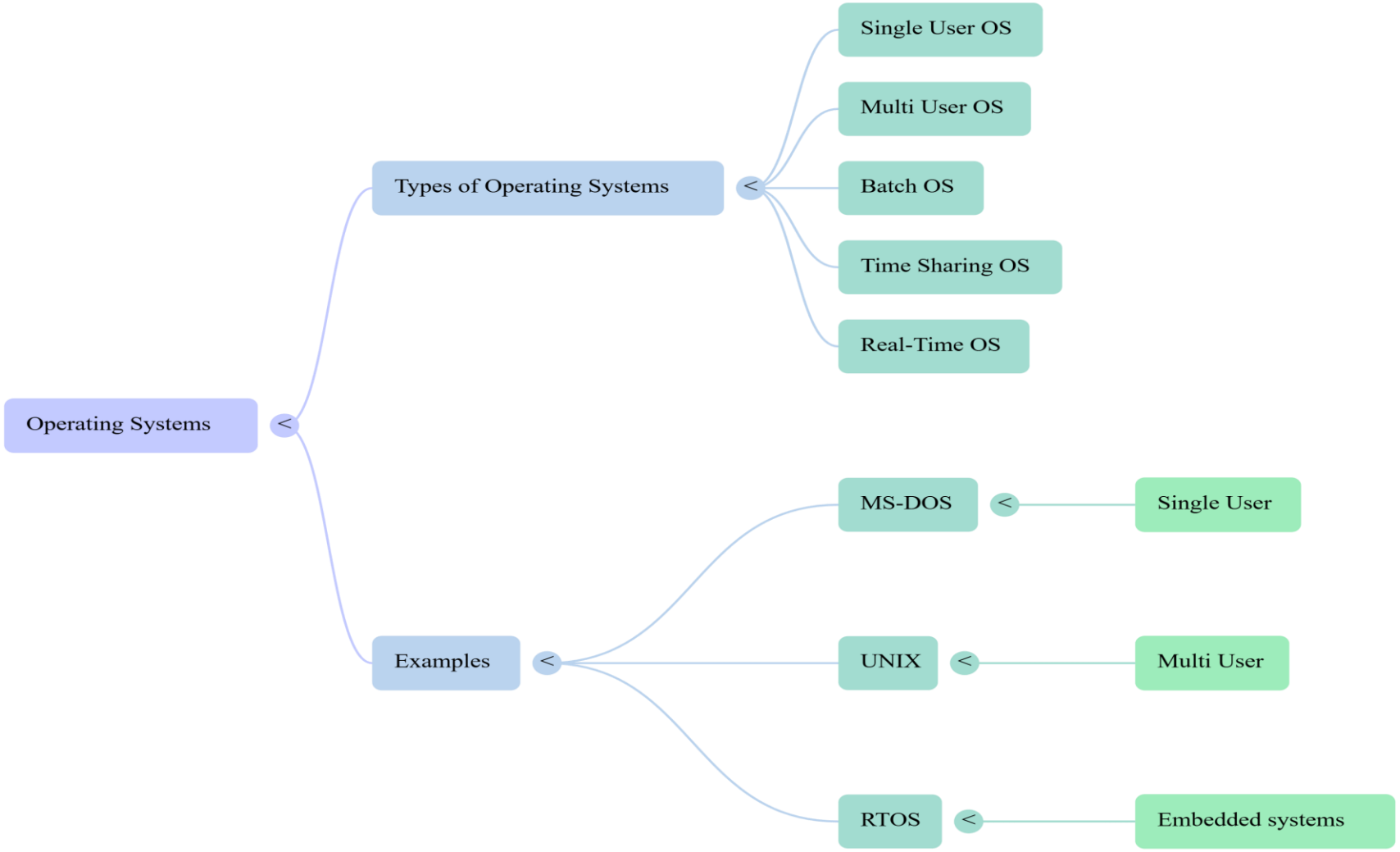
Process Management

- Handles execution of programs
- Allocates CPU time
- Controls multitasking
- Schedules processes

Memory Management

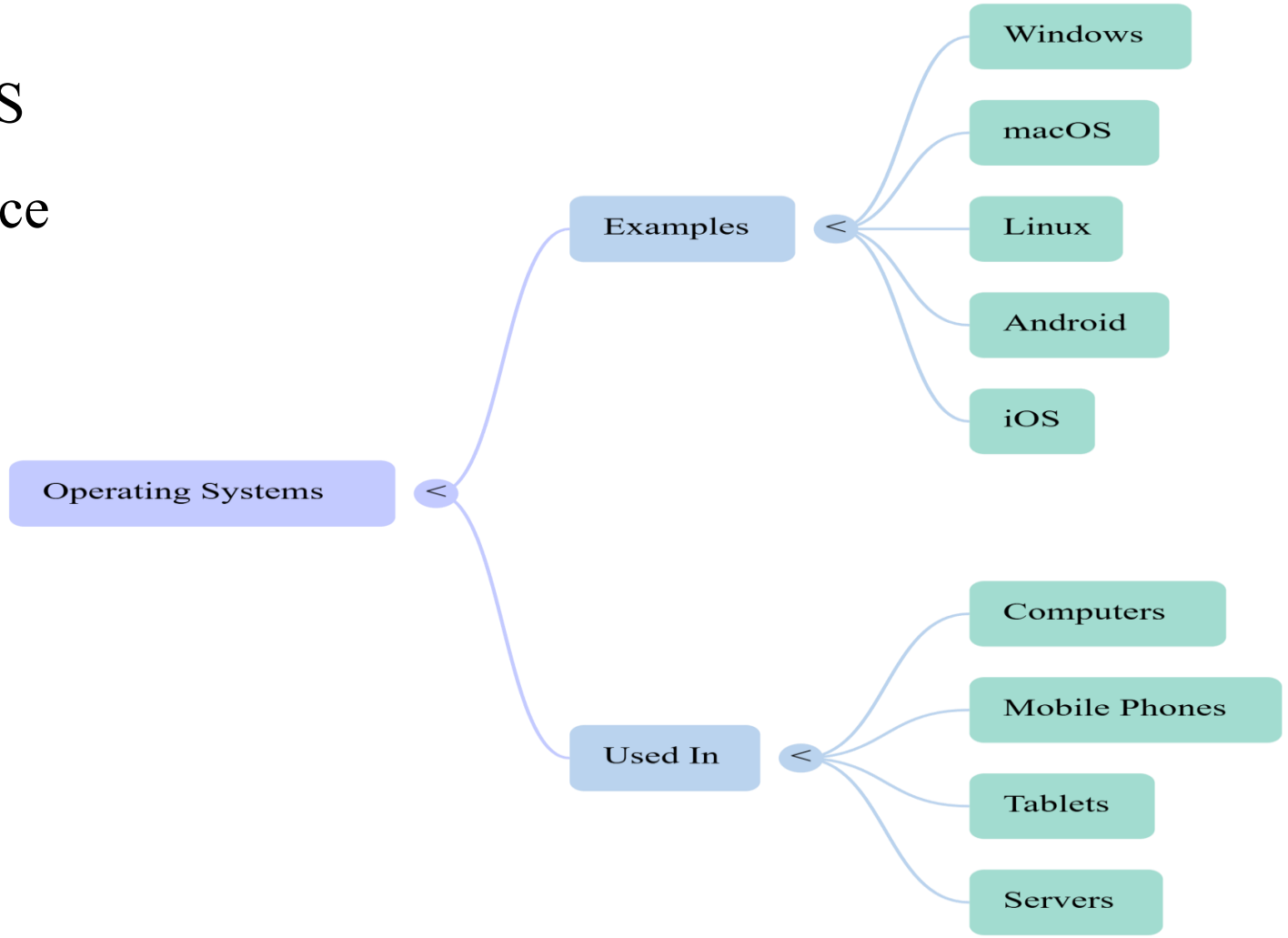
- Allocates memory to programs
- Manages RAM usage
- Prevents memory conflicts
- Optimizes system performance

Mind Map of Operating System



Components of Operating System

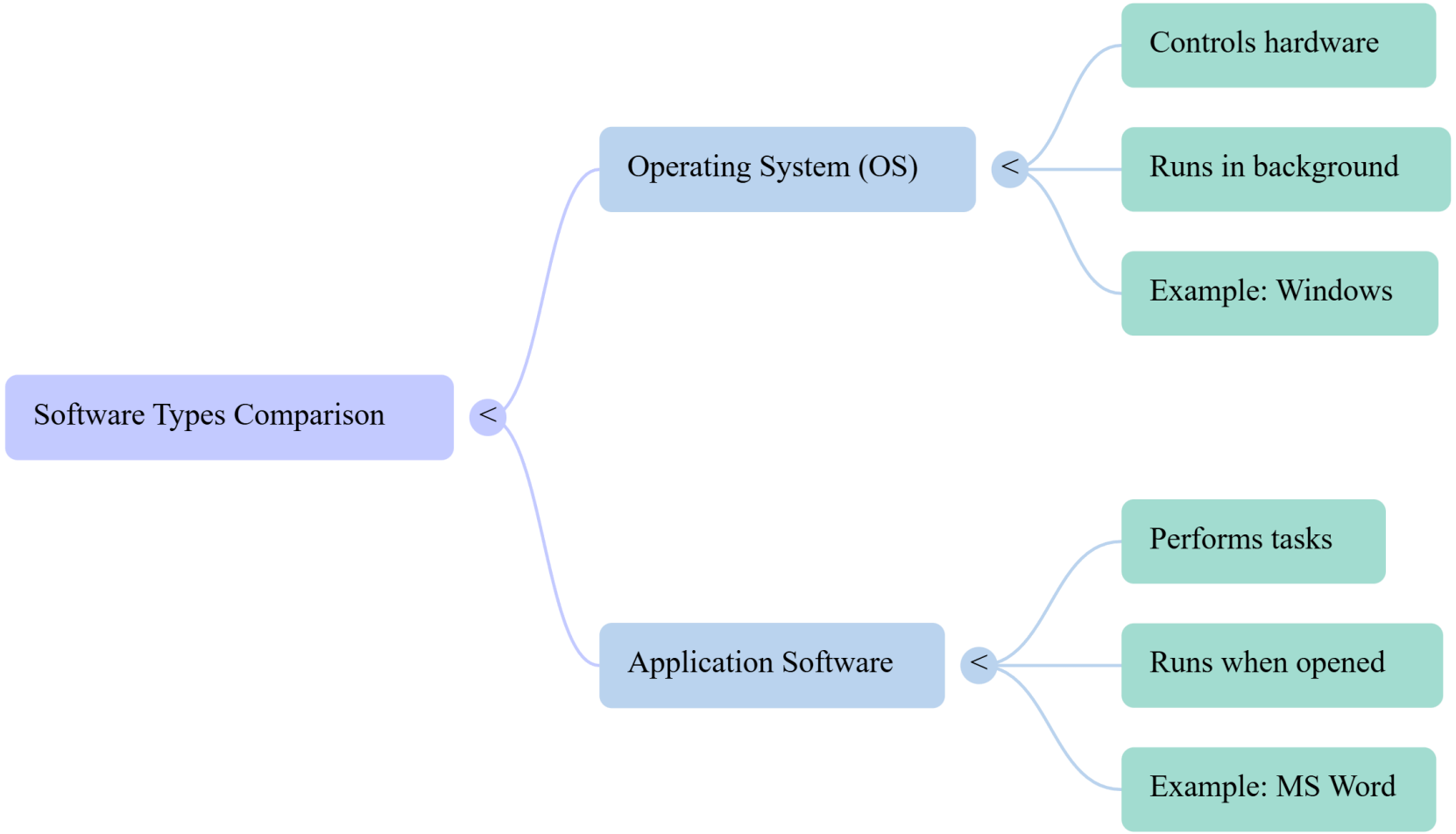
- Kernel – Core of OS
- Shell – User interface
- File System
- Device Drivers
- System Utilities



Advantages of Operating System

- Easy interaction with computer
- Efficient resource management
- Supports multitasking
- Improved security
- Stable system performance

OS vs Application Software



DT-Based Case Study: Operating System

Improving the Computer Lab Experience with a Better Operating System Setup

1. Empathize (Understand the Users & Their Needs)

In a college computer lab, students face frequent problems:

- Systems take **too long** to boot.
- Some computers **hang or freeze** during practical sessions.
- Students cannot save files easily because storage is **unorganized**.
- Different PCs have **different software installed**, causing confusion.
- Lab technicians spend a lot of time fixing basic OS issues.

Users: UG Students, Lab Technicians & Faculty

All users want computers that are **fast, stable, and easy to use**.

DT-Based Case Study: Operating System

2. Define (State the Core Problem)

- The current operating system setup is inconsistent and poorly optimized.
- It creates delays, errors, and frustration during lab sessions.

Problem Statement:

"How might we create a stable, uniform, and user-friendly operating system environment in the computer lab to improve students' learning experience?"

3. Ideate (Generate OS-Based Solutions)

Possible solutions brainstormed:

Software / OS Ideas:

- Install a **lightweight OS** that boots faster
- Create **standard images** so all PCs have the same OS setup.
- Enable **auto backup** to cloud or lab server.
- Use **user profiles** to protect system settings.
- Add **restricted mode**
- Install **required software only**

DT-Based Case Study: Operating System

4. Prototype (Build a Basic OS Setup)

The lab team builds a prototype on **5 computers,** Prototype includes:

•Clean OS installation

•Only essential software (Python, MS Office, IDE tools)

•Disk cleanup settings

•Startup optimization

•One-click "Restore Default Settings" tool

•User login system (Student / Admin)

5. Test (Collect Feedback & Improve)

Feedback from Students:

- Systems boot "much faster."
- No more freezing during program execution.
- Very easy to find files and applications.

Feedback from Lab Technicians:

–"Maintenance time reduced."

–OS image helps reinstall the system in **10 minutes** if needed.

–Permission control prevents software misuse.

DT-Based Case Study: Operating System

Final Outcome

After successful testing, the new OS setup is installed across **all lab computers**.

Benefits achieved:

- 40–60% faster boot time
- Reduced system crashes
- Uniform OS environment for lab sessions
- Easier maintenance for technicians
- Better learning experience for students

Next Topic:

Programming languages