Department of biology

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((Computer Science))

Stage (1)

LEC- ((3))

Operating System and Graphical User Interface (GUI)

By

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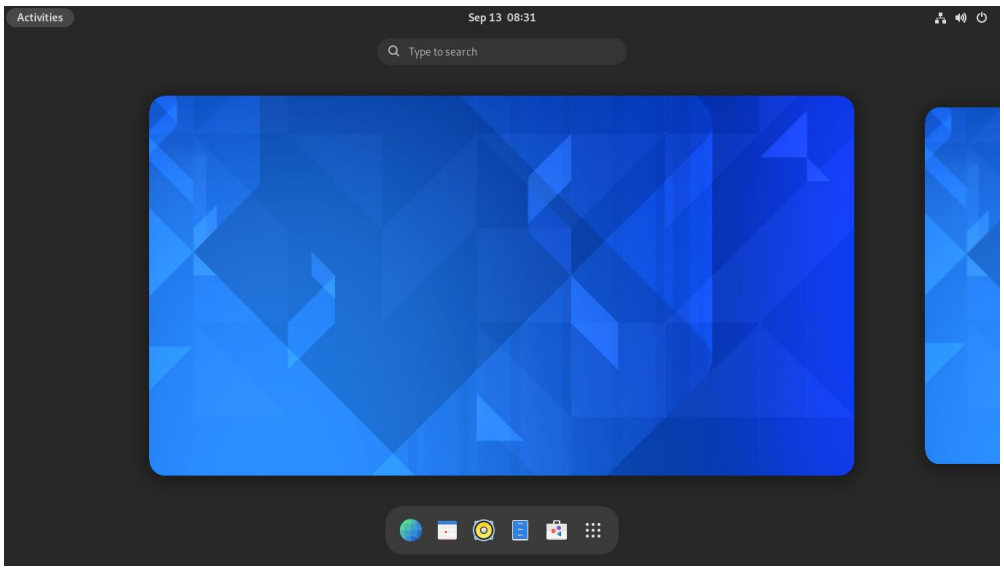
Operating System and Graphical User Interface (GUI)

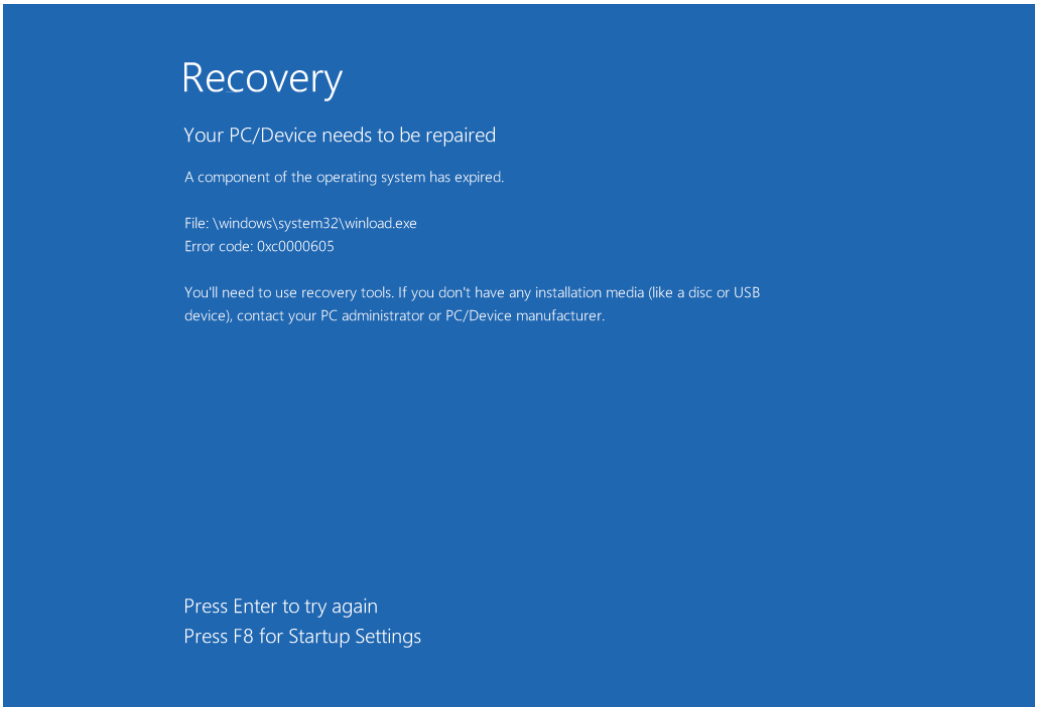
1. Learning Objectives

- Define what an Operating System (OS) is and why we need it.
- Describe core OS services: process, memory, file, device, and security management.
- Explain GUI concepts (WIMP): windows, icons, menus, pointer.
- Use common UI elements such as status areas and settings.
- Work with folders/directories, and create shortcuts.
- Use essential keyboard shortcuts safely.



2. What is an Operating System?

- An operating system is system software that manages computer hardware resources and provides services for application programs.
- It acts as an intermediary between users/applications and the hardware.
- Examples: Windows, Linux distributions, macOS; Mobile: Android, iOS.



3. OS as the Middle Layer

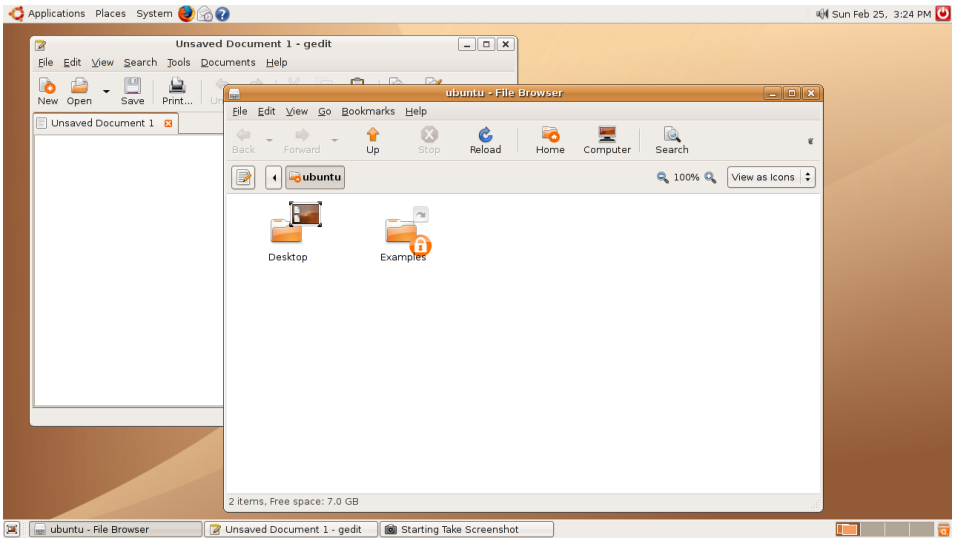
- Applications request services from the OS (for example: read a file, allocate memory, access network).
- The OS controls hardware through drivers and low-level management.
- If the OS fails, applications cannot run reliably.

4. Types of Operating Systems

- Desktop OS: multitasking, supports many peripherals (Windows / Linux / macOS).
- Mobile OS: touch-first, power-efficient, app permissions and sandboxing (Android / iOS).
- Embedded/IoT OS: runs inside devices such as routers, TVs, cars, and sensors.

5. What is a GUI? (GUI vs CLI)

- GUI (Graphical User Interface): interaction using visual elements like windows, icons, and menus.
- CLI (Command Line Interface): interaction using typed commands in a terminal.
- Most modern systems provide both (GUI for ease, CLI for powerful control).

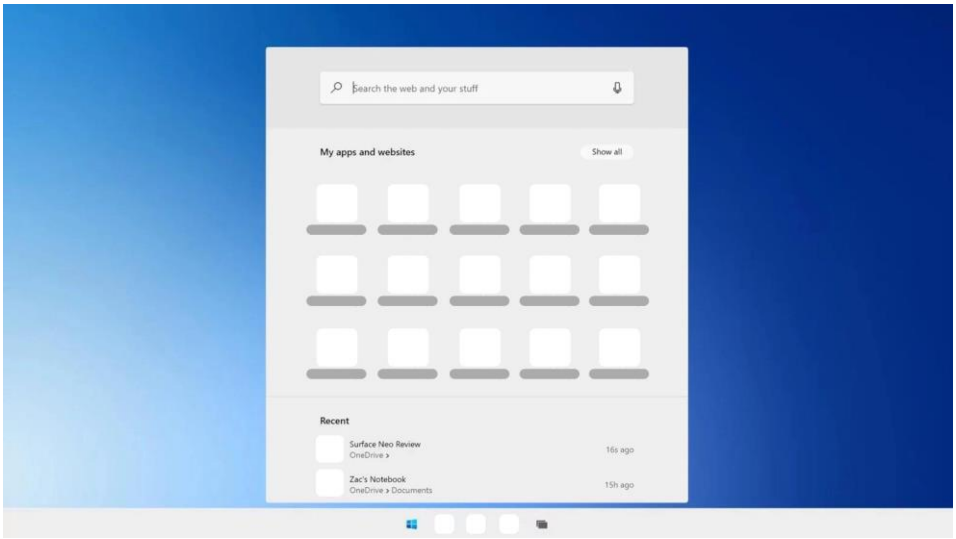


6. WIMP Model and UI Elements

- Windows: areas that display apps/documents; often include minimize/maximize/close controls.
- Icons: visual representations of apps/files/commands.
- Menus: lists of commands (File/Edit/View) and context menus (right-click).
- Pointer: mouse cursor or touch input to select items.

7. Using Mouse / Touchpad Techniques

- Point: move cursor to an item.
- Left-click: select or open; Double-click: open (common on desktop).
- Right-click: open a context menu related to the selected item.
- Drag & drop: move or copy items.
- Touchpad: two-finger scroll; pinch to zoom; multi-finger gestures to switch apps/desktops.



8. Common Icons & Status Area

- Status area shows quick settings such as network, volume, battery, clock, and notifications.

- Use it to connect Wi-Fi/VPN, adjust sound, check battery, and view alerts.

9. Menus and Menu Selection

- Menus organize commands; learn common menu names like File, Edit, View, Help.
- Keyboard access is often available (e.g., Alt to focus menus).
- Use Undo (Ctrl+Z) to revert mistakes when supported.

10. Folders and Directories

- A folder (directory) is a container used to organize files.
- Paths describe where a file is located.
- Create meaningful folder structures and names.
- Back up important folders; avoid editing system folders unless necessary.

11. Opening and Closing Windows

- Open: double-click (desktop), press Enter, use Start/search, open recent items.
- Close: click the X button, use Alt+F4 (Windows/Linux) or Cmd+W (macOS).
- Save your work before closing. Some apps keep running in the background ("close" vs "quit").

12. Creating Shortcuts & Essential Keys

- A shortcut is a link to an app/file/folder (it does not duplicate the original).
- Common shortcuts: Copy Ctrl+C, Paste Ctrl+V, Undo Ctrl+Z, Find Ctrl+F.
- Switch apps: Alt+Tab; Lock screen: Win+L (Windows).

13. Mini Lab

- Task A: Create OS_Lab folder; create Docs/Images/Backup inside; move and copy a file; rename the copied file with today's date.
- Task B: Create a desktop shortcut to OS_Lab; open file manager with shortcut (Win+E on Windows); search for your renamed file; close windows safely.