



Technology in Action

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Ninth Edition

Technology in Action

Chapter 5

Using System Software: The Operating System, Utility Programs, and File Management

Chapter Topics

- System software basics
- Types of operating systems
- What the operating system does
- The boot process: Starting your computer
- The desktop and Windows features
- Organizing your computer: File management
- Utility programs

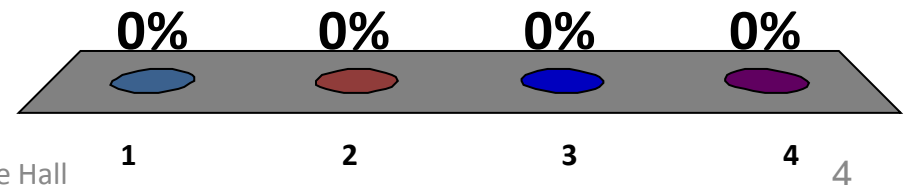
The operating system (OS) controls how a computer system functions.

1. True
2. False



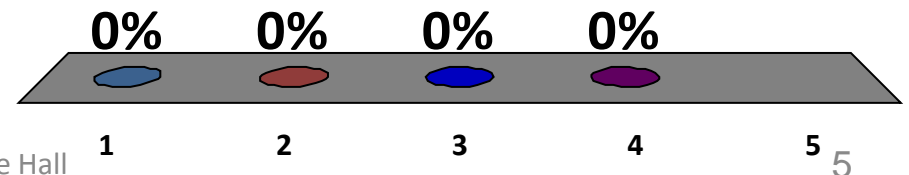
When RAM is full, the OS will use part of the hard drive as:

1. RAM file
2. thrash file
3. Overflow memory
4. Virtual memory



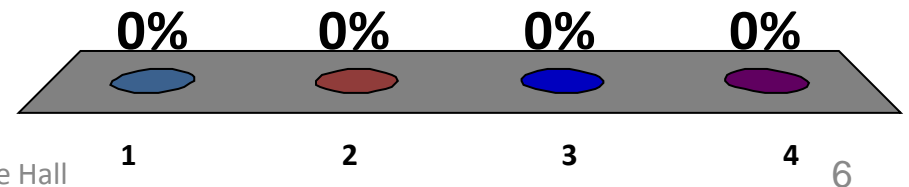
Utility programs perform all of the following tasks *EXCEPT*:

1. Backups
2. Security
3. Diagnostics
4. Web browsing



When a computer is starting up, what verifies that all attached hardware is in place?

1. POST
2. BIOS
3. Device drivers
4. RAM



System Software Basics

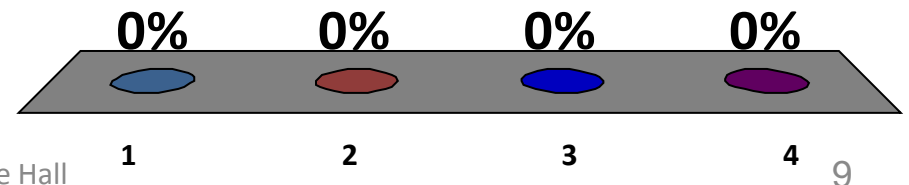
- Two basic types of software:
 - Application software is used to do everyday tasks at home and work
 - System software is set of programs that helps run the computer
 - Operating system is group of programs that controls how computer system functions
 - Utility programs are small programs that perform many general housekeeping tasks

Types of Operating Systems

- Categorized by type of device in which they are installed
 - Mainframes
 - Network computers
 - Personal computers
 - Mobile devices
 - Robots

Real-time operating systems can be found all but the following:

1. Printers
2. Personal computers
3. Automobiles
4. Robotic Cameras



Real-Time Operating Systems

- Used for machinery that performs a repetitive series of specific tasks in an exact amount of time
- Requires minimal user interaction
 - Car engines
 - Medical devices
 - Common appliances
 - Robotic cameras



Operating Systems for Networks, Servers, and Mainframes

- Multiuser operating system enables more than one user to access the computer at one time
- Networks require a multiuser operating system
- Manage all user requests, ensuring they do not interfere with each other
- Examples include Windows Server, Linux, and UNIX

UNIX

- Multiuser, multitask operating system
- Network operating system used primarily with mainframes
- UNIX is a brand that belongs to The Open Group
- Any vendor who meets requirements can use the UNIX name and can modify the code to run specifically on their hardware

Operating Systems for Mobile Devices

- Smartphones do more than let user make and answer phone calls
- Include productivity, media player, camera features and Web connectivity
- Most modern smartphones have modest multitasking capabilities
 - Check e-mail while making phone call

Operating Systems for Personal Computers

- Windows
 - Multitasking capabilities
 - Networking capabilities
 - Windows 7 includes ability to use touch commands on touch-screen monitors
- Mac OS was first commercial operating system to incorporate a graphical user interface (GUI)

Web-Based Operating Systems

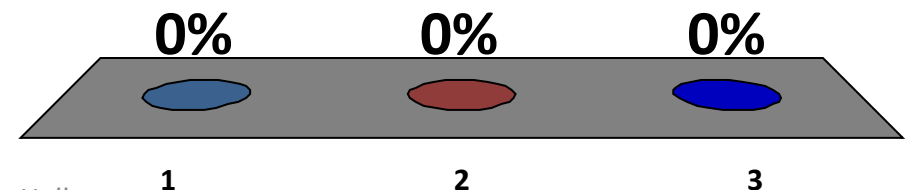
- Prototypes are being developed
- Still need a computer, operating system, and Web browser
- Enables users to access applications and content via the Web anywhere, on any machine and at any time
- Google is taking steps toward developing a complete Web-based operating system

Linux

- Open source software for personal computers and as network operating system
- Stable operating system
- Can be downloaded free
- Runs on PCs, netbooks, iPods, and gaming systems
- Several versions are proprietary and come with support and other products

Which of the following is one of the reasons why individuals or companies do not use Linux.

1. Linux is too expensive to purchase
2. Linux does not provide technical support
3. Linux cannot be modified or customized



Upgrading Your Operating System

- Questions to ask before you upgrade:
 - Is current OS still supported?
 - Are there significant features in new version?
 - Will your hardware work with the new OS?
 - Is your software compatible with new OS?
- Back up all data files before starting upgrade

What the Operating System Does

- Coordinates and directs the flow of data and information
 - Provides a user interface
 - Manages the processor, or CPU
 - Manages memory and storage
 - Manages hardware and peripheral devices
 - Provides means for software applications to work with the CPU

The Operating System



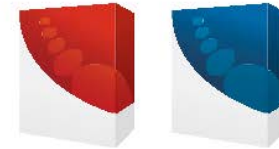
Manages computer hardware and peripherals



Provides a user interface



The Operating System



Provides a consistent interaction between applications and CPU



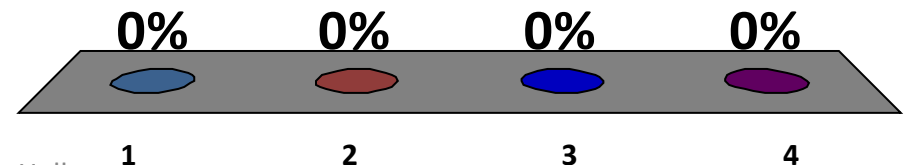
Manages memory and storage



Manages the processor

The _____ includes features such as desktop, icons, and menus that allow users to communicate with the computer system.

1. Utility program
2. Mainframe
3. User interface
4. Graphics simulator



The User Interface

- Enables user to interact with the computer
- Types of interfaces
 - Command-driven interface
 - Menu-driven interface
 - Graphical user interface (GUI)

```
a C:\>cd c:\wordproc\memos
C:\wordproc\memos>dir/w
Volume Serial Number is 216C-11F8
Directory of C:\wordproc\memos

[.]          0 file(s)          0 bytes
              2 dir(s)          4,266.55 MB free

C:\wordproc\memos>_
C:\wordproc\memos>cd..
C:\wordproc>rd memos
C:\wordproc>dir/w
Volume Serial Number is 216C-11F8
Directory of C:\wordproc

[.]          0 file(s)          0 bytes
              2 dir(s)          4,266.50 MB free

C:\wordproc>cd..
C:\>rd wordproc
C:\>
```

```
b File Edit Search View Options Help
C:\WINDOWS\system32\cmd.exe /c C:\WINDOWS\system32\cmd.exe /c
New
Open...
Save
Save As...
Close
Print...
Exit
File Version: C:\WINDOWS\SYSTEM32\cmd.exe; Version: 4.72.2012.600
File Version: C:\WINDOWS\SYSTEM32\cmd.exe; Version: 4.72.2012.600
Platform: Win98
Found setup.ini with valid Signature. Assume Local (CD) install.
Checking -Win95:
ValidatedBrowserModeInINI :D:\MSVOUTLOOK\IES\NEWIESSETUP.INI:
INI entry for Shell Integration:
Integrated browser downloaded, but not requested.
Checking for IE4 version.
File Version: C:\WINDOWS\SYSTEM32\cmd.exe; Version: 4.72.2012.600
File Version: C:\WINDOWS\SYSTEM32\cmd.exe; Version: 4.72.2012.600
None. If installed, continue but don't update installation.
```

Processor Management

- CPU usually is asked to perform several tasks at once
- OS arranges for execution of all activities
- Assigns a slice of time to each activity
- Switches among processes millions of times a second
- Appears that everything is happening seamlessly

Memory & Storage Management

- OS uses RAM as temporary storage area for instructions and data
- Processor accesses these instructions and data from RAM when it needs them
- OS is responsible for coordinating space allocation in RAM
- Clears item from RAM when processor no longer needs them

Virtual Memory

- RAM has limited capacity
- When RAM is full, Instructions and data are stored on the hard drive
- Borrowing hard drive space is called virtual memory

- Swap file
- Paging
- Thrashing



- Increase RAM to avoid using virtual memory

Hardware and Peripheral Device Management

- Device drivers
 - Facilitate communication between device and the operating system
 - Translates device's commands into commands the operating system can understand
- Plug and Play
 - Hardware and software standard
 - Facilitates the installation of new hardware

Software Application Coordination

- For programs to work, they must contain code the CPU recognizes
- Application programming interface (API)
 - Blocks of code for similar procedures
 - Prevent redundancies in software code
 - Make it easier for software developers

The Boot Process: Starting the Computer

- The boot process loads the operating system into RAM
- Four basic steps:
 1. BIOS is activated
 2. A POST checks attached devices
 3. The operating system is loaded into RAM
 4. Configuration and customization settings are checked

Handling Errors in the Boot Process

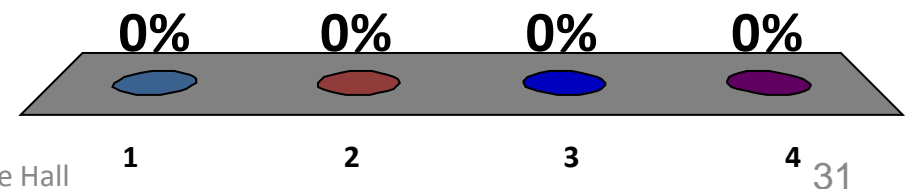
- Uninstall recently installed software
 - Use uninstall program or Control Panel
- Restart computer in Safe mode
 - Use Device Manager to view devices
- Last Known Good Configuration
- System Restore
- Reboot computer

The Desktop and Windows Features

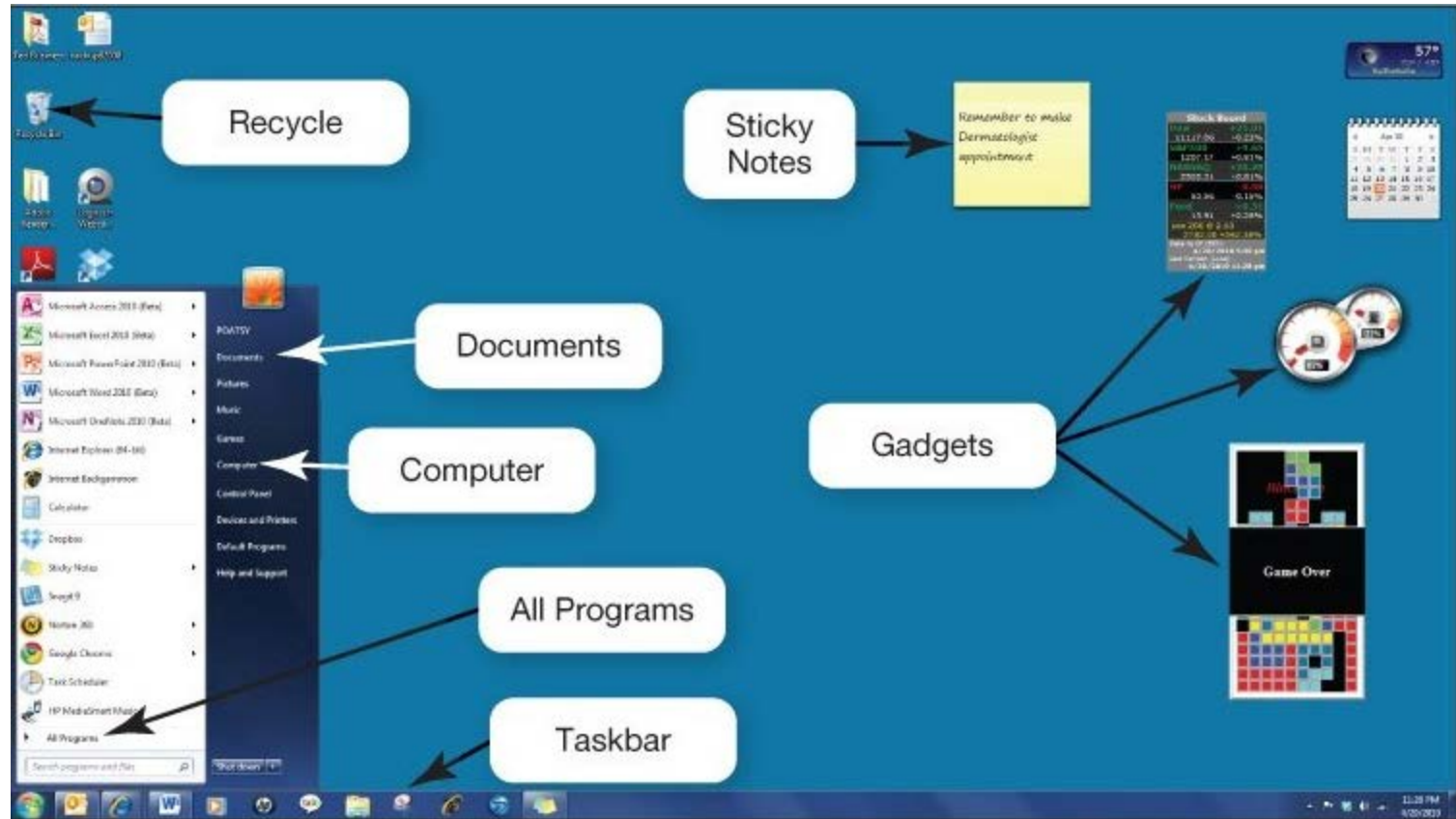
- On the Windows 7 desktop you will find:
 - Recycle Bin
 - Gadgets
 - Taskbar
- In the Windows 7 Start menu you'll find:
 - Documents
 - Computer
 - All Programs

What type of interface does Windows 7 provide?

1. Command-driven
2. Menu-driven
3. Graphical user
4. Utility-driven

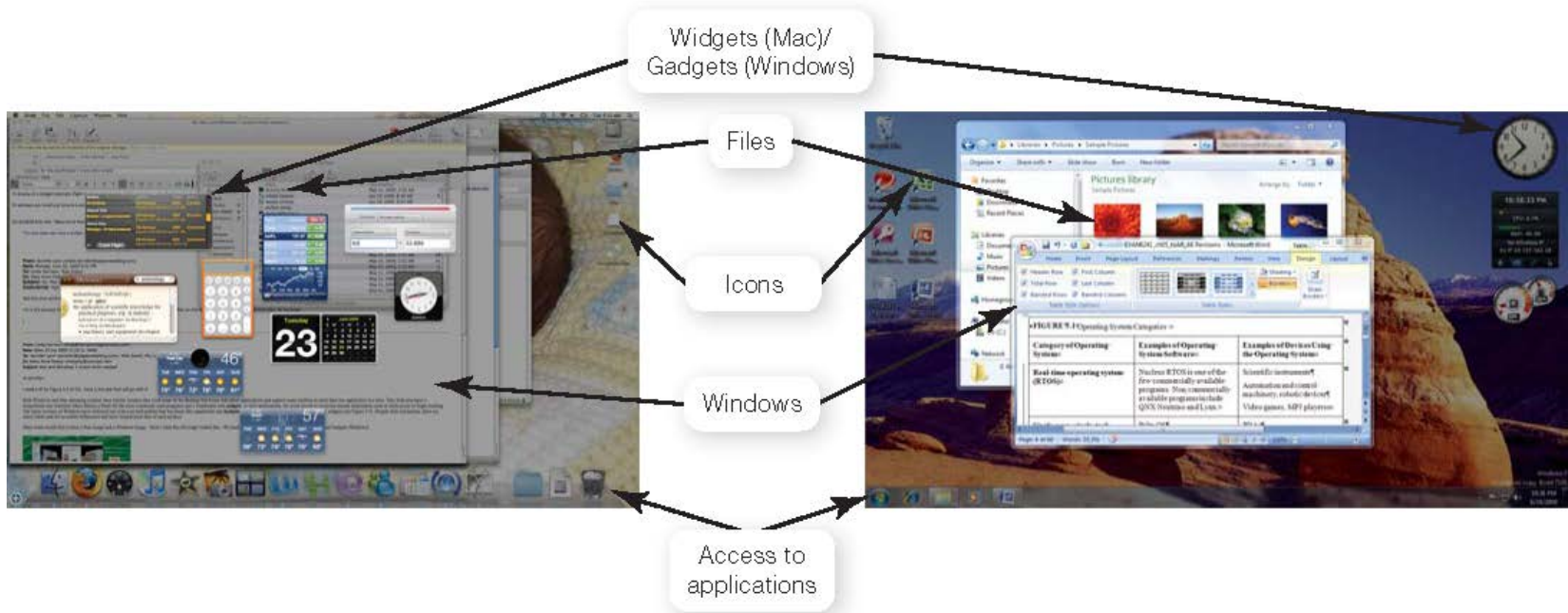


Windows 7 Desktop

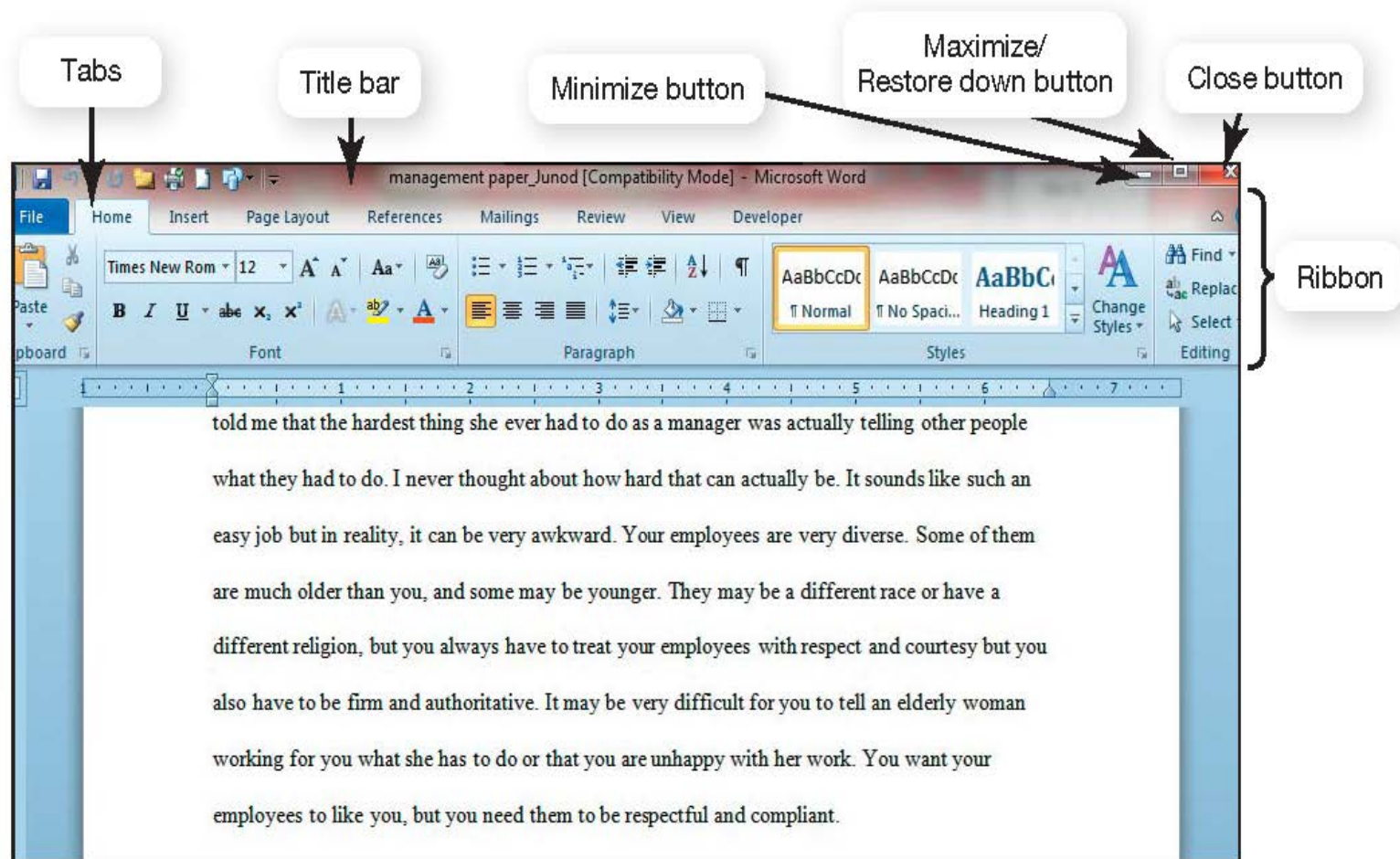


Mac vs. Windows

- Mac OS and Windows are similar in functionality



Common Windows Features



I know how to use the “ALT” and “TAB” keys to alternate between programs.

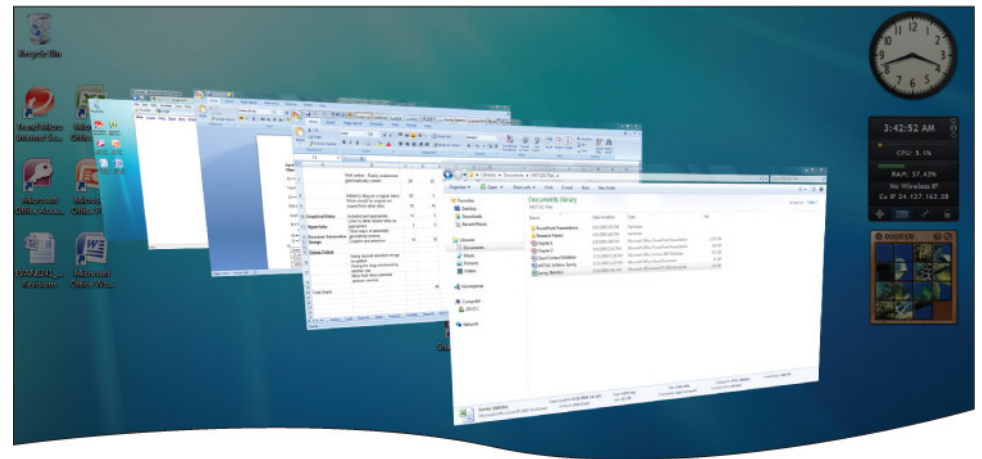
1. True
2. False



Viewing Windows

- Side-by-side
- Stacked
- Cascading
- Snap
- Windows Flip
- Aero Shake

Windows Flip 3D



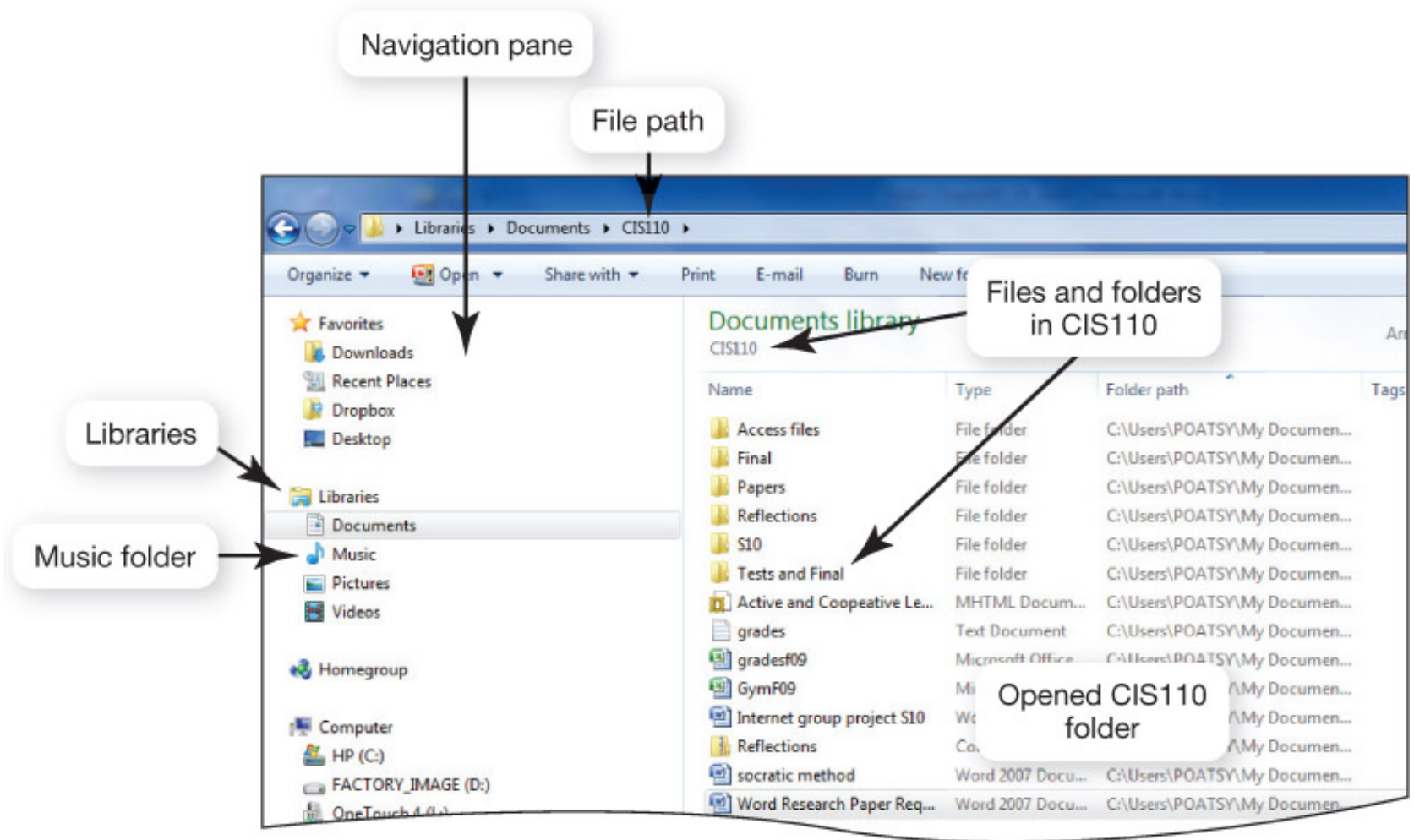
Organizing Your Computer: File Management

- Additional function of the operating system is to enable file management
- Provides an organizational structure to the computer's contents
- Uses hierarchical directory structure:
 - Folders
 - Libraries
 - Drives

Organizing Your Files

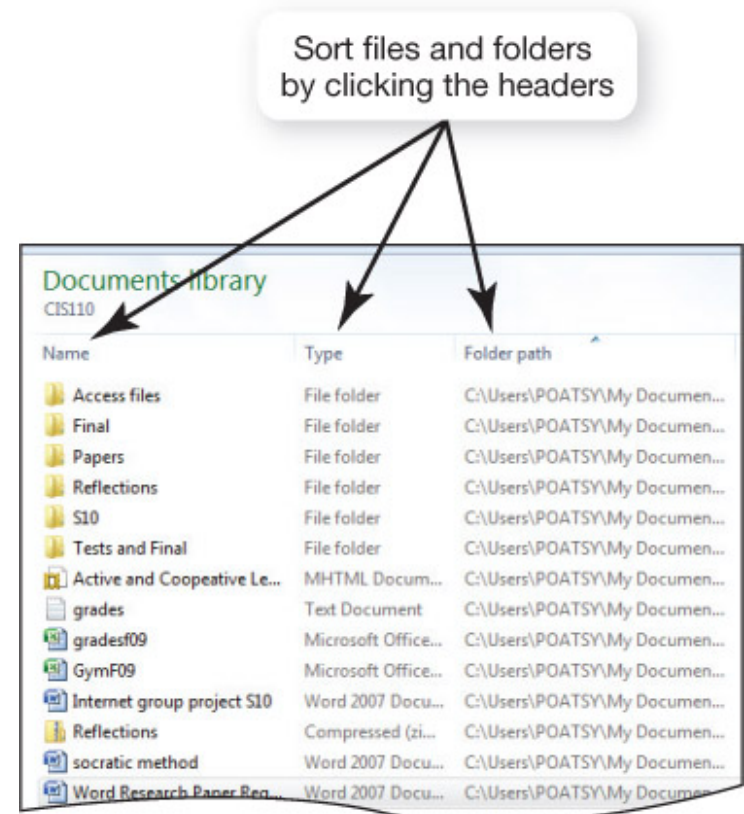
- A *file* is a collection of related pieces of information stored together
- A *folder* is a collection of files
- A *library* gathers files from different locations and displays them as if they were all saved in a single folder

File Management



Viewing and Sorting Files & Folders

- Views button offers different ways to view folders and files
 - Tiles view
 - Details view
 - List view
 - Small and Medium icons view
 - Large and Extra large icons view

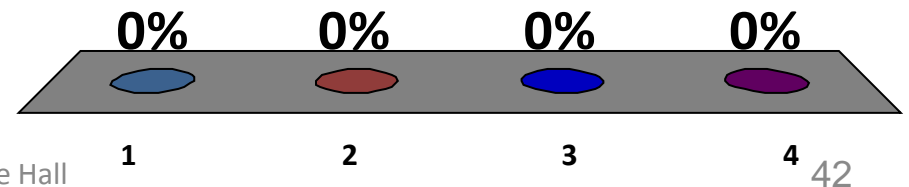


Naming Files

- File name is the name you assign to the file when you save it
 - First part is similar to your first name
- In Windows, an extension, or file type, follows the file name and a period or dot (.)
 - Similar to a last name, extension identifies the application needed to read the file

Which of the following is NOT a Microsoft Office file extension?

1. .doc
2. .xlsx
3. .accdb
4. .wpd



Common File Name Extensions

Extension	Type of Document	Application
.doc	Word processing document	Microsoft Word 2003
.docx	Word processing document	Microsoft Word 2007 and 2010
.xlsx	Spreadsheet	Microsoft Excel 2007 and 2010
.accdb	Database	Microsoft Access 2007 and 2010
.pptx	PowerPoint presentation	Microsoft PowerPoint 2007 and 2010
.pdf	Portable Document Format	Adobe Acrobat or Adobe Reader
.rtf	Text (Rich Text Format)	Program that can read text documents
.txt	Text	Program that can read text documents
.htm /.html	Hyper Text Markup Language	Any program that can read HTML
.jpg	JPEG image	Programs capable of displaying images
.zip	Compressed file	WinZip

File Naming Conventions

- Each OS has own naming conventions
- Up to 255 characters
- Forbidden characters in Windows:

" / \ * ? < > | :

- Mac file names may not use a colon (:), are case sensitive and do not need file extensions

File Path

- Determine location of a file by its file path
- File path includes drive, folders, subfolders, the file name, and the extension
 - Path separators include a backslash (\) for Windows, or colon (:) for Mac



Working with Files

- File-management actions
 - Open
 - Copy
 - Move
 - Rename
 - Delete
 - Recycle Bin (Windows)
 - Trash (Mac)

Utility Programs

- Small applications that perform special functions
- Some are incorporated into operating system
 - Firewall and file-compression utilities
- Stand-alone utility programs offer more features and require frequent updating
 - Antivirus and security programs

Display Utilities

- Personalization has features to change the appearance of your desktop:
 - Background
 - Screen savers
 - Window colors
- Vast array of downloadable options are available on the Web

The Programs and Features Utility

- Installing a new program usually runs a wizard automatically that walks you through installation
- Delete programs by:
 - Selecting the program's own uninstall option
 - Windows uninstaller utility

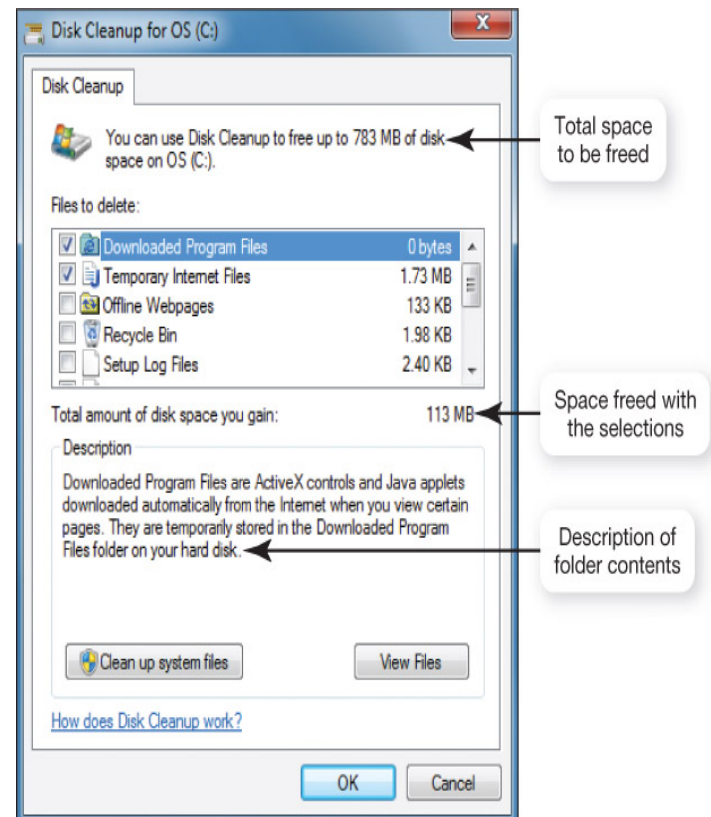
File Compression Utilities

- Makes a large file more compact
- Easier and faster to send over Internet
- Windows has built-in file compression
 - Take out redundancies
 - Look for repeated patterns

The rain in Spain falls mainly on the plain.

System Maintenance Utilities

- Disk Cleanup removes unnecessary files
 - Recycle Bin
 - Temporary Internet files
 - Offline Web pages
- If not deleted, these files can hinder efficient performance



System Maintenance Utilities (cont.)

- Disk Defragmenter regroups related pieces of files on the hard disk
- Error-checking checks for lost files and fragments and physical errors on hard drive
- Use Task Manager to check on program that has stopped working or to exit nonresponsive programs

I know how to defragment my hard drive.

1. True
2. False



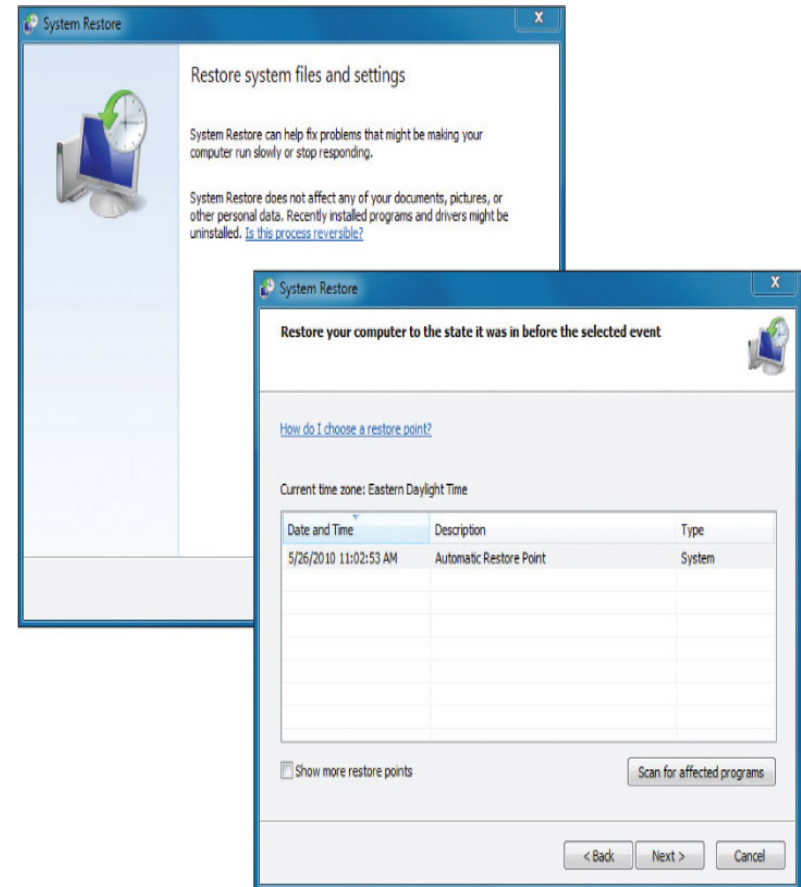
I know how to use disk cleanup.

1. True
2. False



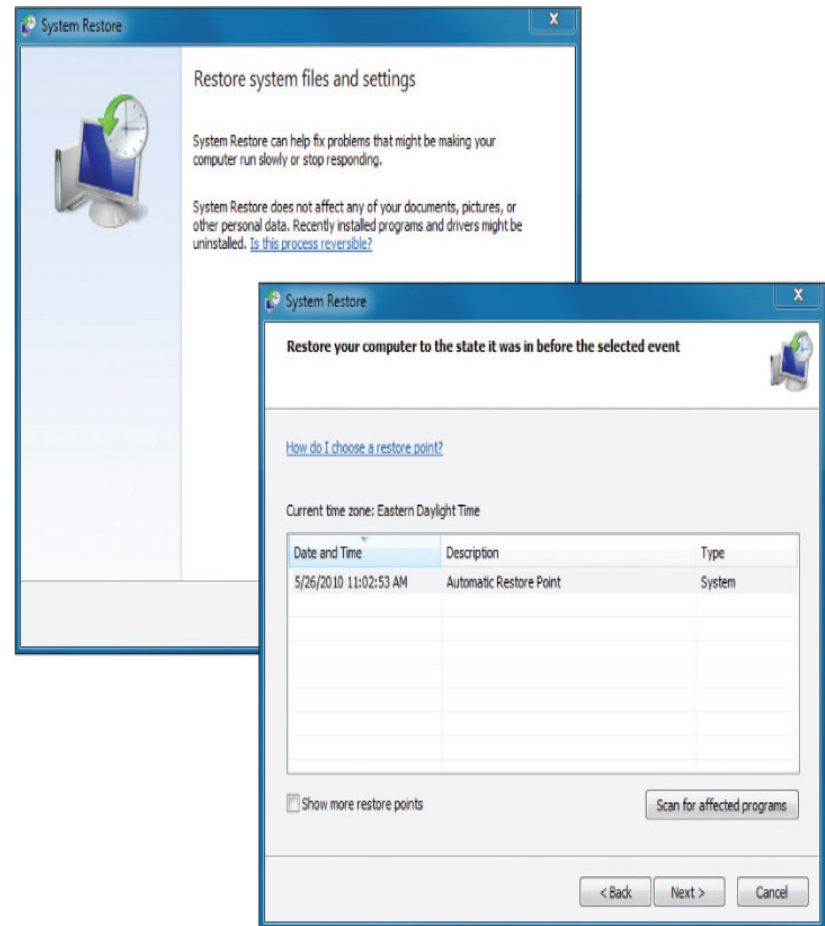
System Restore Utility

- Rolls system settings back to a specific date before problems
 - System restore point
 - Made every week
 - Before installing software
 - Custom restore point



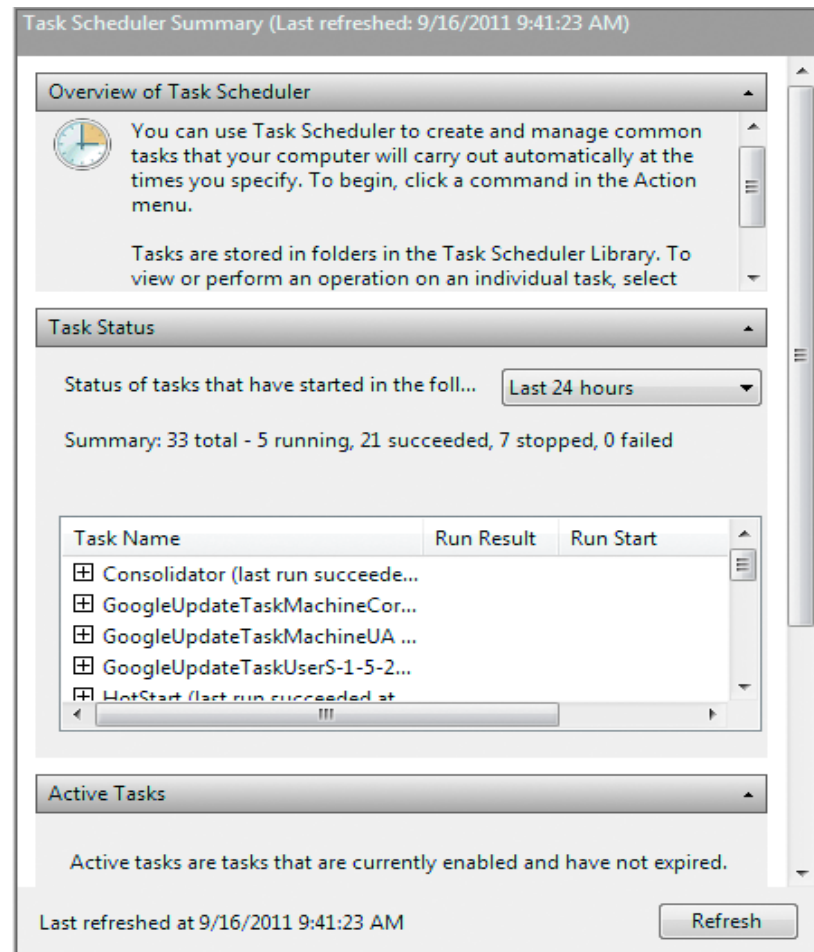
System Backup Utility

- Backup
 - Creates a copy of data on the hard drive to another storage device
 - Back up important files
 - Keep backup copy in safe location



The Task Scheduler Utility

- Allows you to schedule tasks to run automatically at predetermined times, with no additional action on your part

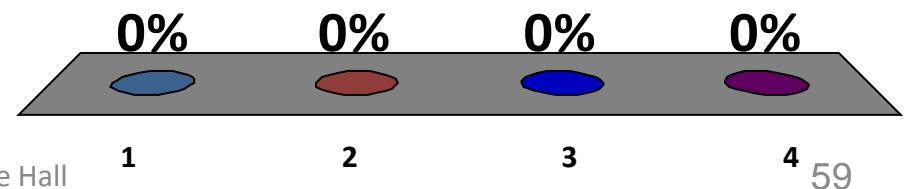


Accessibility Utilities

- Ease of Access Center
 - Centralized location for assistive technology
 - Tools to adjust accessibility settings
 - High contrast
 - Magnifier
 - Narrator
 - On-screen keyboard
 - Windows speech recognition

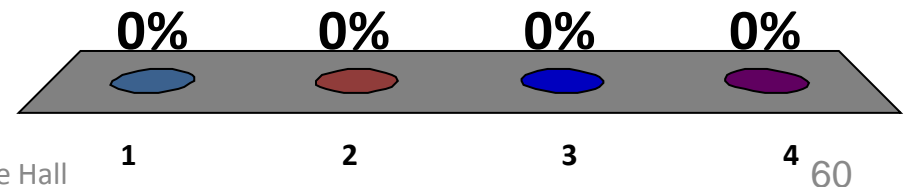
Which of the following is not a multiuser/multitask operating system?

1. DOS
2. Linux
3. z/OS
4. Mac OS X



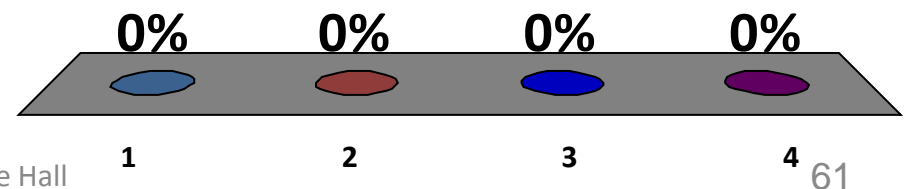
Real-time operating systems are also referred to as:

1. Passive Systems
2. Embedded Systems
3. Cell Systems
4. Stored Program



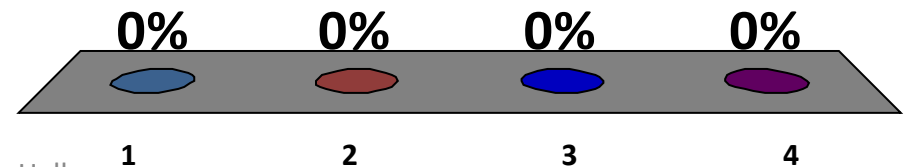
What type of programs allow the OS to communicate with peripheral devices?

1. Device managers
2. Utility programs
3. Device drivers
4. Operating drivers



is a special diagnostic mode designed for troubleshooting errors.

1. Error-checking mode
2. Security mode
3. Safe mode
4. Troubleshooting mode



Chapter 5 Summary Questions

1. What software is included in system software?

Chapter 5 Summary Questions

2. What are the different kinds of operating systems?

Chapter 5 Summary Questions

3. What are the most common operating systems?

Chapter 5 Summary Questions

4. How does the operating system provide a means for users to interact with the computer?

Chapter 5 Summary Questions

5. How does the operating system help manage resources such as the processor, memory, storage, hardware, and peripheral devices?

Chapter 5 Summary Questions

6. How does the operating system interact with application software?

Chapter 5 Summary Questions

7. How does the operating system help the computer start up?

Chapter 5 Summary Questions

8. What are the main desktop and window features?

Chapter 5 Summary Questions

9. How does the operating system help me keep my computer organized?

Chapter 5 Summary Questions

10. What utility programs are included in system software, and what do they do?



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