Question 1:

In this project, we will go over five common operating system issues and the utilities or repairs associated with them. As there are no shots directly provided here, I will describe what such shots would show, along with how one would reproduce them if you happen to want them for your report.

1. Windows' Blue Screen of Death (BSOD)

A Blue Screen of Death is a critical failure of the operating system or software produced by driver issues, software bugs, or even hardware malfunction. It's usually characterized by a blue screen with an error message on it.

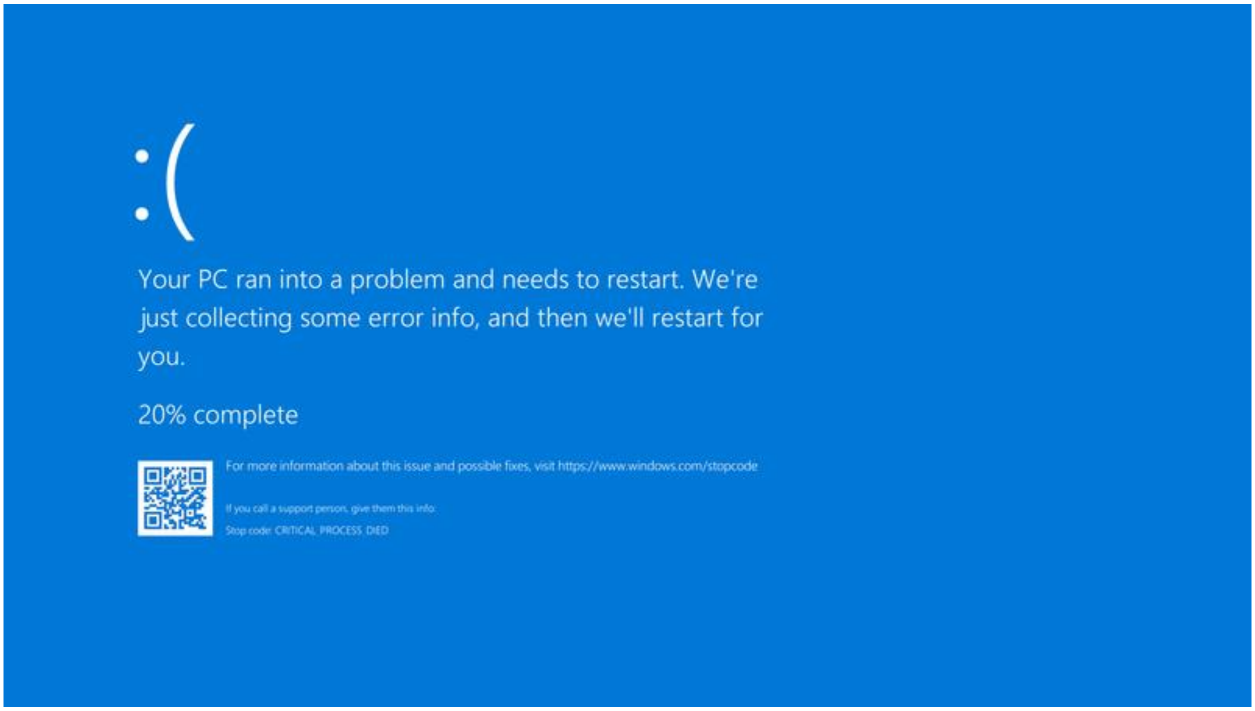
Solution

Look at the code inside the error. On the BSOD screen, note the error code.

Employ Event Viewer: Open Event Viewer-eventvwr.msc, open "Windows Logs" > "System," and locate information about a crash to be able to diagnose an error.

Driver Update: Perform a reinstall or update of drivers, especially after recent installation. Update problematic drivers with the help of Device Manager.

Screenshot:



:(

Your PC ran into a problem and needs to restart. We're just collecting some error info, and then we'll restart for you.

20% complete

For more information about this issue and possible fixes, visit https://www.windows.com/stopcode

If you call a support person, give them this info:

Stop code: CRITICAL PROCESS DIED

SOURCE: https://en.m.wikipedia.org/wiki/File:Bsodwindows10.png

2. slow performance

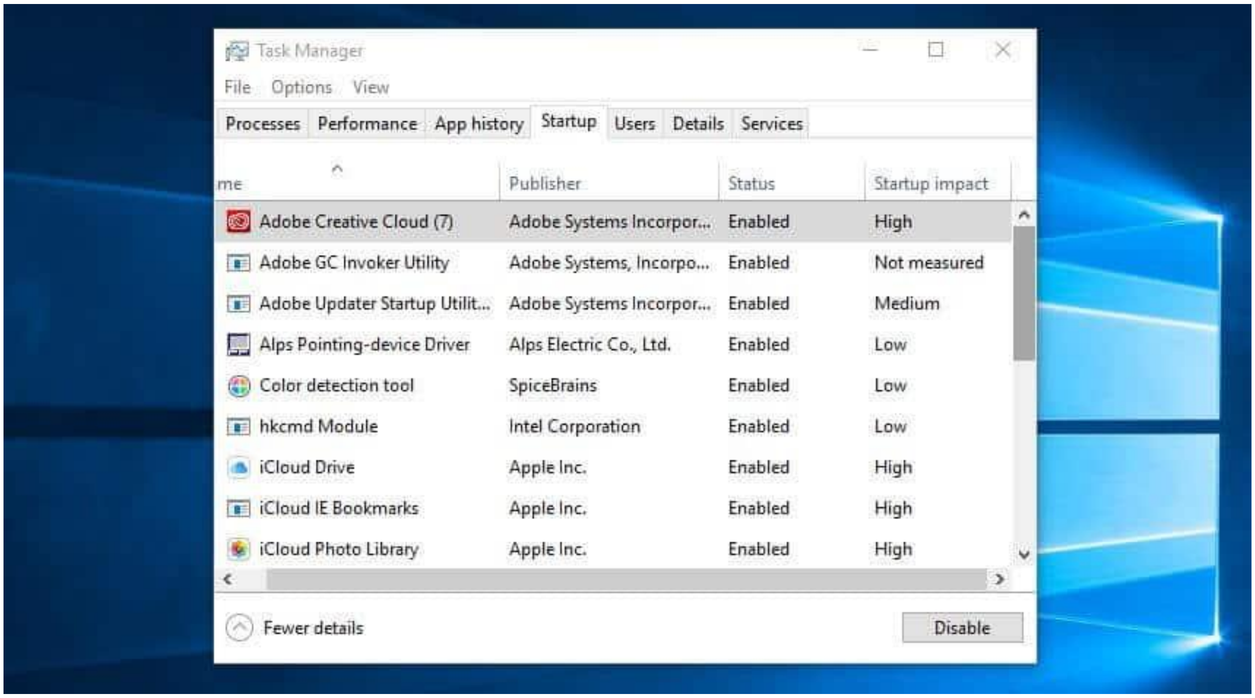
Description: Operating systems can start to freeze or bog down due to possible disk fragmentation, too many memory uses, or background processes.

Task Manager is the solution: Opening Task Manager by using Ctrl + Shift + Esc, check whether there are any processes using high amounts of either memory or CPU. Finish all unnecessary jobs to free up the resources.

Disk Cleanup: Run the Disk Cleanup-cleanmgr-to clean out free space and delete temporary files.

Defragmentation of hard drive: The utility of Defragment and Optimize Drives will help in improving the performance of the hard drive.

Snapshot:



me	Publisher	Status	Startup impact
Adobe Creative Cloud (7)	Adobe Systems Incorpor...	Enabled	High
Adobe GC Invoker Utility	Adobe Systems, Incorpo...	Enabled	Not measured
Adobe Updater Startup Utilit...	Adobe Systems Incorpor...	Enabled	Medium
Alps Pointing-device Driver	Alps Electric Co., Ltd.	Enabled	Low
Color detection tool	SpiceBrains	Enabled	Low
hkcmd Module	Intel Corporation	Enabled	Low
iCloud Drive	Apple Inc.	Enabled	High
iCloud IE Bookmarks	Apple Inc.	Enabled	High
iCloud Photo Library	Apple Inc.	Enabled	High

Source: https://www.comparitech.com/utilities/speed-up-slow-laptop-or-pc-windows-10-8-or-7/

3. Application Crash: An application may crash repeatedly due to corrupted files or incompatibility with other software, apart from low system resources.

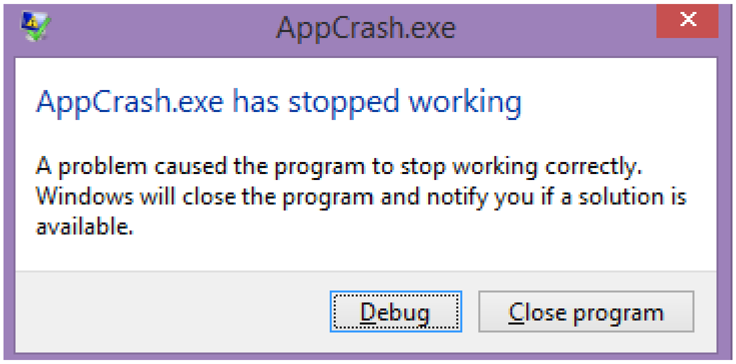
Solution: Compatibility Check: Right-click the executable and choose Compatibility Troubleshooter to fire up the program in compatibility mode.

Compatibility Check: Right-click the executable and choose Compatibility Troubleshooter to fire up the program in compatibility mode.

Run the application: Reinstall the application after you uninstall it in order to replace any corrupted files.

Update Software: Ensure your installed software is current for bug fixes and enhanced compatibility.

Screenshot:



AppCrash.exe

AppCrash.exe has stopped working

A problem caused the program to stop working correctly. Windows will close the program and notify you if a solution is available.

Source: https://www.comparitech.com/utilities/speed-up-slow-laptop-or-pc-windows-10-8-or-7/

4. Issues Related to Network Connectivity

An operating system may not be able to access the internet or other networked devices just because of some network connectivity problems. These might be brought about by poorly configured settings within the network, problems in the driver, or defective hardware.

Solution:

Using the ipconfig command: In order to check the configuration of the network, in command prompt, type ipconfig /all. To renew the IP address, type ipconfig /release and ipconfig /renew.

Troubleshooting Networks: Whenever there is an issue, by default it automatically detects and fixes a problem in a network through Network Troubleshooter under settings, which can be opened through Settings > Network & Internet > Troubleshoot.

Reset Network Adapter: Through the device manager, turn off the network adapter and then again turn it on.

Screenshots:

Source: https://www.coeosolutions.com/network-and-connectivity-issues

5. Boot Problems

Description: Bad BIOS settings, failing hardware, or corrupted boot files are all common reasons a machine would not boot properly .

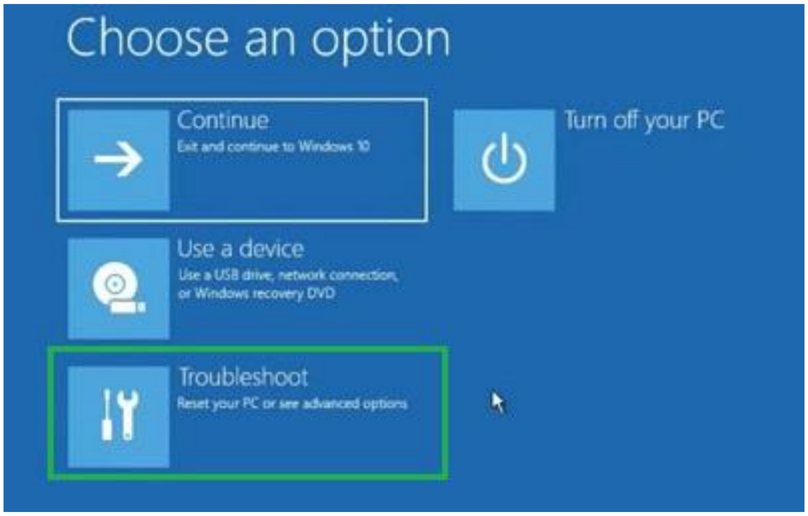
Solution

Fixing Startup: If you are able to start up in the Windows Recovery Environment, you can run Startup Repair to automatically fix issues.

Set the boot order: If you cannot get there, enter your BIOS/UEFI settings and make sure it recognizes the correct drive as its first choice to boot from.

Command Prompt: Use the following commands to repair MBR and boot files: bootrec /fixmbr, then bootrec /fixboot, then bootrec /rebuildbcd.

Screenshot:


Choose an option
Continue
Exit and continue to Windows 10
Turn off your PC
Use a device
Use a USB drive, network connection, or Windows recovery DVD
Troubleshoot
Reset your PC or see advanced options

Source: https://www.geeksforgeeks.org/troubleshoot-windows-10-boot-issues/

Question 2:

It contrasts with earlier operating systems, which were designed solely to run a single program at a time-batch processing-or interactively in the case of early time-share systems. In contrast, an RTOS is designed to process events or data in real-time with a guaranteed response time. Its key objective is to meet strict deadlines and is indispensable in applications where time is of essence. Real-time operating systems differ from general-purpose operating systems in that they have well-defined responses to events taking place in the real world, and these responses are dependable and consistent. The key objective is, therefore, to ensure that the system can meet all the assigned tasks within their specified deadlines.

Notable variations include: Deterministic Response: Reliability of accomplishment of a task within a specific, predictable time is ensured by RTOSs, while GPSs are concerned more with the overall throughput without much consideration for deterministic response. Task Scheduling: RTOS relies upon special scheduling algorithms such as rate-monotonic or earliest-deadline-first to ensure that the tasks get completed by the deadline. This accord greater priority to time-critical activities compared to less vital activities.

Minimum Latency: Since real-time operating systems are based on minimum latency, they could respond to external inputs instantly.

Examples of Industrial Automation System Applications Where an RTOS Is Essential

Reason: Industrial automation systems require robotic arms, machinery, and other equipment to respond quickly to the changing conditions. Any delay could cause accidents, damage to equipment, or low-quality products produced. RTOS makes control loops run at regular intervals to obtain accurate and timely responses.

Vehicle Systems:

Reason: Present day vehicles use RTOS to operate ECUs, deployment of airbag, and ABS. In ABS-like applications, an RTOS is used to vary brake pressure. This has to be done repeatedly in quick time with high frequency to prevent locking of wheels. A fraction of a second's delay will make the vehicle unstable. Therefore, speed and reliability are key to guarantee safety.

Medical Devices:

Justification: Medical devices, such as ventilators, pacemakers, and infusion pumps, require precise control in operation; for instance, a pacemaker must provide electrical impulses with considerable regularity to keep the proper beat of the heart. Because an RTOS ensures that critical timing conditions are met, it minimizes device failures that can lead to fatal results.

Question 3:

Status of Memory Allocation:
The memory diagram provided allows us to see the following:
External Fragmentation: External fragmentation is indicated by free memory spaces between allotted blocks.
Allocation Algorithm: It is hard to pinpoint the precise allocation algorithm that was employed in the absence of other details. The existing condition of memory, however, indicates that either a best-fit or a first-fit strategy may have been applied.
Compaction Methods:
Basic Compaction
Every block that has been allocated is moved to the start of memory.
At the end, a contiguous free region is produced.
Data Movement: A total of 40k + 90k + 170k + 230k = 530k bytes will be moved from all blocks (OS, j5, j4, j3).
Compaction in conjunction with relocation:
Just the bricks that require moving are done so.
Logical addresses are mapped to physical addresses using a relocation table.
Data Movement: 170k + 230k = 400k bytes, or just J4 and J3, need to be moved.
In contrast:
Data Movement: Compared to ordinary compaction, which needed 530k bytes of data movement, compaction with relocation only required 400k bytes.
Just moving the blocks that were required reduced the quantity of data that needed to be physically moved.
Memory relocation benefits
Flexibility: Relocation eliminates the need for periodic compaction and permits dynamic allocation and deallocation.
Efficiency: Relocation can be more efficient than frequent compaction in systems that deallocate and allocate memory often.
Relocation allows for dynamic loading of modules, which enhances system speed by allowing modules to be loaded into memory as needed.
In virtual memory systems, where processes can have a logical address space that is far larger than the available physical memory, relocation is a key idea.

Question 4:

a. Shortest job first scheduling

process	Brust time	Arrival time	Completion time	Turnaround time	Waiting time
P3	2	3	5	2	0
P1	11	2	16	14	3
P4	10	4	26	22	12
P5	16	5	42	37	21
P2	28	1	70	69	41

Grant chart:

```
0   2   3   5      16      26      42               70

|   |   |   |       |       |       |               |

|   P1  P3  P1      P4      P5      P2                   |
```

b. Shortest remaining time scheduling

process	Brust time	Arrival time	Completion time	Turnaround time	Waiting time
P3	2	3	5	2	0
P1	11	2	16	14	3
P4	10	4	26	22	12
P5	16	5	42	37	21
P2	28	1	70	69	41

Grant chart

```
0  1  2  3  5      16      26      42               70

|  |  |  |  |       |       |       |               |

|  P2 P1 P3 P1      P4      P5      P2                   |
```

c. Round- robin scheduling (time slice= 4ms)

Process	Brust time	Arrival time	Completion time	Turnaround time	Waiting time
P1	11	2	43	41	30
P2	28	1	67	66	38
P3	2	3	9	6	4
P4	10	4	47	43	33

P5	16	5	63	58	42

Grant chart

```
0  1  5  9  13 17 21 25 29 33 37 41 43 47 51 55 59 63 67
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  P2 P1 P3 P2 P4 P5 P1 P2 P4 P5 P1 P2 P4 P5 P2 P5 P2 |
```

Suggested Application of Each Job

P1: File Compress (Burst Time: 11, Priority: 3)

This can be a file compress system procedure running in the background because it has an average burst time and priority.

P2: System Backup (Burst Time: 28, Priority: 1)

This could be a system backup procedure running whenever the system has free resources because it has the longest duration of burst and low priority.

P3: User Input Handling (Priority: 4; Burst Time: 2)

Because of its small burst length and high priority, it can handle short user inputs or interactions.

P4: Log Analysis (Priority : 2), Burst Time : 10.

Because of its low priority and moderate burst time, this process will be suitable for log analysis activities running in the background.

P5: Real-time Data Processing (Burst Time: 16, Priority: 5)

That would be the critical real-time data processing, such as financial transaction or sensor data analysis, that has the highest priority but medium burst time.

Question 5:

A situation arises when a group of processes are blocked waiting for resources held by other processes in the waiting group. This is what is referred to as a deadlock. As a result, the execution of process and performance might suffer a lot.

Impact on System Performance

Resource Wastage: The resources that are not utilized are held by the deadlocked processes, hence causing the wastage of resources.

Reduced Throughput: The overall throughput of the system reduces when the operation gets stalled.

Unpredictable Behaviour: Deadlocks can make the system unpredictable and unstable to work with.

System Crash: A deadlock, in worst cases, may lead to a crash and system instability.

Impact on Process Performance

Termination of the Process: A deadlock can be resolved only by process abortion, which may lead to loss of work and even damage to data.

Resource Pre-emption: In case of deadlock, processes can get stuck and may require pre-emption of resources. This will not cause an error and temporarily affect its operation.

System Rollback: The system may have to be rolled back, at times, to a past state in order to break a deadlock, which will result in loss of progress.

Possible Remedies to Reduce Deadlock and Prevent It:

Mutual Exclusion: Only one process should be allowed to use a resource at a time.

Hold and Wait: Prevent the processes from acquiring any new resources while keeping those they already have.

Avoid the pre-emption of resources from the processes using this rule.

Circular Wait: Impose that all the processes request resources in some particular order and enforce a total ordering on all the resources.

Detection and Recovery of Deadlock:

Detect Deadlock: In order to detect whether the deadlock has taken place or not, algorithms.

Recovery: Select one or more processes to abort their resource usage or pre-empt them to break a deadlock.

Resource Allocation Graph Inspection

In the given resource allocation graph, there is no deadlock. A deadlock will happen if there is a cycle in this graph. To put it another way, for a deadlock to occur there must be a set of waiting processes in a circular wait for resources held by the others. There are no such cycles in this graph; at some stage each activity may release its resources and allow the other processes to proceed.

Question 6:

a. First- come, first- served (FCFS)

In FCFS, the requests are addressed and appear in the queue

Queue: 52, 98, 183, 37, 122, 14, 124, 65, 67

Head start at 50

Movement:

50 to 52: 2 tracks

52 to 98: 46 tracks

98 to 183: 85 tracks

183 to 37: 146 tracks

37 to 122: 85 tracks

122 to 14: 108 tracks

14 to 124: 110 tracks

124 to 65: 59 tracks

65 to 67: 2 tracks

Total tracks travelled= 643

Average tracks per request= 643/9=71.44

b. Shortest seek time first (SSTF)

Queue = 52,98,183,37,122,14,124,65,67

Head start at 50

Movement:

50 to 52: 2 tracks

52 to 37: 15 tracks

37 to 14: 23 tracks

14 to 65: 51 tracks

65 to 67: 2 tracks

67 to 98: 31 tracks

98 to 122: 24 tracks

122 to 124: 2 tracks

124 to 183: 59 tracks

Total track travelled= 209

Average tracks per request= 209/9=23.33

c. SCAN

Queue = 52,98,183,37,122,14,124,65,67

Head starts at 50

Movement:

50 to 14: 36 tracks

14 to 37: 23 tracks

37 to 52: 15 tracks

52 to 65: 13 tracks

65 to 67: 2 tracks

67 to 98: 31 tracks

98 to 122: 24 tracks

122 to 124: 2 tracks

124 to 183: 59 tracks

Total tracks travelled= 205

Average tracks per request =205/9=22.78

d. C_SCAN

Queue= 52, 98, 183, 37, 122, 14, 124, 65, 67

Head starts at 50

Movement:

50 to 14: 36 tracks

14 to 37: 23 tracks

37 to 52: 15 tracks

52 to 65: 13 tracks

65 to 67: 2 tracks

67 to 98: 31 tracks

98 to 122: 24 tracks

122 to 124: 2 tracks

124 to 183: 59 tracks

Total tracks travelled=205

Average tracks per request= 205/9=22.78

e. LOOK
Queue = 52, 98, 183, 37, 122, 14, 124, 65, 67
Head start at 50
Movement:
50 to 14: 36 tracks
14 to 37: 23 tracks
37 to 52: 15 tracks
52 to 65: 13 tracks
65 to 67: 2 tracks
67 to 98: 31 tracks
98 to 122: 24 tracks
122 to 124: 2 tracks
124 to 183: 59 tracks
Total tracks= 205
Average tracks per request= 205/9=22.78

Question 7:

It provides two of the most used filesystems in modern operating systems, namely the New Technology File System, mainly applied in contexts related to Windows, and the Fourth Extended Filesystem that is generally used in Linux versions. Each of these filesystems uses unique features, architectures, and benefits in respective ways for specific use cases within contemporary computing environments.

1. New Technology File System, or NTFS

MS developed NTFS and released it in 1993; it is a file system that, with every installation of Windows, installs by default.

Master File Table Architecture: This system includes the Master File Table as the prime controlling factor. It maintains records of all the files, directories, and related metadata in a particular drive. In fact, each directory and file maintain its record in the MFT.

Features and Functionalities

Access Control Lists: The use of an access control list is an innate NTFS security feature, ensuring that proper control right from the file level is affected.

File Encryption and Compression: It supports EFS and file- and folder-level compression.

Support for Large Files: It allows usage of large files on dynamic drives up to a maximum of 16 TB.

Fault Tolerance: Utilizing the log replay for data consistency, NTFS can recover from system crashes.

Sparse Files and Disk Quotas: NTFS provides for disk quotas, which can be applied by systems to restrict users in their usage of storage, and sparse files, which enable efficient usage of disk space.

Advantages

Reliability: The utilization of the journaling activity in NTFS reduces corruption from system crashes.

Granular Security: NTFS is effective in an enterprise environment because the ACLs provide a tremendous amount of granular control with regard to access to files. Rich Feature Set: Large volumes, compression, and encryption capabilities make NTFS effective for a variety of applications. Limitations Compatibility: NTFS usage in cross-operating system platforms is limited because not all non-Windows operating systems natively support NTFS. Fragmentation: If NTFS is not defragmented periodically, fragmentation could degrade performance over time.

EXT4, which was released in 2008, is an upgrade to EXT3 and the default file system shipped in many Linux variants.

EXT4 has a structure based on an inode-based architecture, where every file is associated with an inode-an object storing metadata about the file, such as permissions, timestamps, and size in bytes.

Unlike EXT3, EXT4 uses extents for mapping very large files, thereby reducing fragmentation. By using an extent, which is a continuous block of storage, data access becomes more efficient.

Delayed Allocation: to reduce fragmentation, EXT4 uses the concept of delayed allocation. It delays the allocation of blocks to the time data will be flushed to disk.

Features and Functionalities

EXT4 is backward compatible with EXT2 and EXT3, making it easily migrate from earlier Linux systems.

File Reallocation: EXT4 supports file reallocation by saving space for those files that are

Advantages

Performance: Ext4 is much more efficient than its predecessors because of its features like extents, delayed allocation, and multi-block allocation, allowing it to deal with huge files more efficiently.

Less Fragmentation: By using extents, fragmentation could be very minimal which works in keeping performance steady over a long period.

Limitations

Lack of Advanced functionalities: Although Linux would be able to carry out similar functionalities with other utilities, generally speaking, there is no advanced functionalities like encryption and compression that are inbuilt in the EXT4 compared to NTFS.

Compatibility Issues due to Partial Windows Support: The incompletely native support from Windows makes the use of EXT4 in mixed operating system environments more problematic.

Question 8:

VUIs are recently gaining widespread popularity due to the fact that they grant users a natural and simple way of communicating with technology. The use of VUI in gadgets, such as Apple Siri, Google Home, and Amazon Echo, brings forth efficiency on the ground of accessibility and convenience of different consumers. Effective context awareness, user-oriented design, and natural language processing plays a colossal role in determining how well they interact with the user. Let's talk about their capabilities, efficacy, and difficulties.

Efficiency of VUIs in Promoting User Convenience and Accessibility

Available

Assistive Technology: The VUIs have a number of benefits related to users with physical limitations, either in mobility or poor vision. It enables users to perform various functions, like operating smart devices, dialing, and accessing information, all without requiring physical interaction from the user.

Simplified Interaction: Since the VUIs do not require the complexity of conventional GUIs, the operations can be comfortably executed by elderly, blind, or people unfamiliar with technology.

Ease of Use

Hands-Free Operation: The VUI's permit the working of operations without involving hands, which is quite convenient when driving a car, cooking or any other work that requires manual dexterity.

How to Handle Natural Language Understanding and Sentiment Analysis

Natural Language Processing

Speech Recognition: This is one of the first applications of NLP in VUIs, by ASR, which essentially recognizes the spoken word into text. The speech recognition systems, like Amazon Alexa and Google's Speech-to-Text, are usually trained on large datasets, including a variety of accents, dialects, and pronunciations.

Context Awareness

Contextual Understanding: A good VUI could make use of context for better performance. For example, when the user says, "Turn on the lights," it would apply previous context or location to determine which room the lights are in.

Challenges relating to VUI's Comprehension of Users

Accents & Dialects: The main challenge that VUIs face is recognizing different accents, dialects, or geographic variations in speech. Unusual accents may lead to misunderstanding and user frustration.

Ambiguity in Commands: Natural language, by its very nature, is ambiguous; and without further context, VUIs may find it difficult to distinguish between two similar-sounding sentences that have distinct meanings. Their efficiency for complex requests is therefore limited.

System Reliability

Speech Recognition Errors: These can be caused by background noise and ambiguous speech, among other factors. Even state-of-the-art voice user interfaces sometimes commit speech recognition errors. And if any of those commands is misjudged, users can get infuriated, especially when this happens repeatedly.

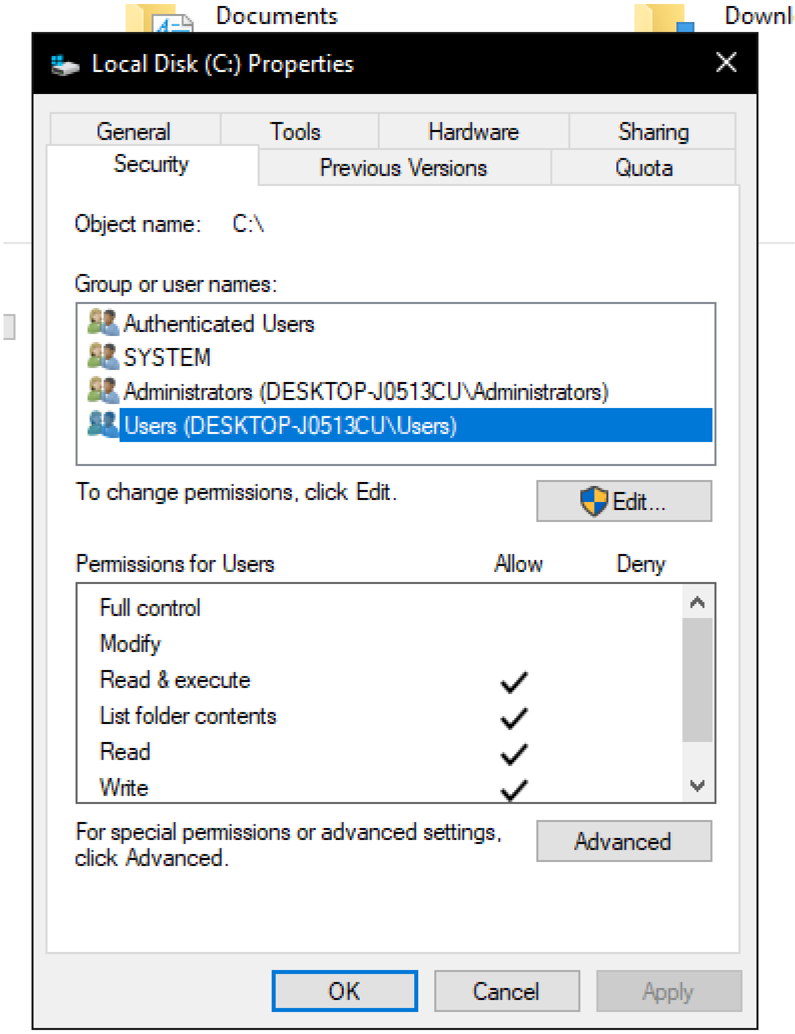
Dependence on networking: Most of the VUIs depend on cloud services to process information mainly in NLP. They, therefore, depend on consistent internet networking. At low levels of connectivity, VUIs may fail to work, or be unreliable.

Choreography Challenges and Usability

While much merit lies in VUI for accessibility and convenience, the irreconcilability of context awareness, natural language comprehension, and stability of systems hinder the practical utility of such systems. Advances in machine learning, at especial deep learning and reinforcement learning models, are continuing to improve VUI in its capabilities to understand various inputs of language, adapt to user preferences, and minimize recognition errors.

Question 9:

1. Change file permission to be readable and writeable by the owner and executable by other:
   Command: chmod 744 filename
   Verify: ls -l filename



Object name: C:\

Group or user names:

- Authenticated Users
- SYSTEM
- Administrators (DESKTOP-J0513CU\Administrators)
- Users (DESKTOP-J0513CU\Users)

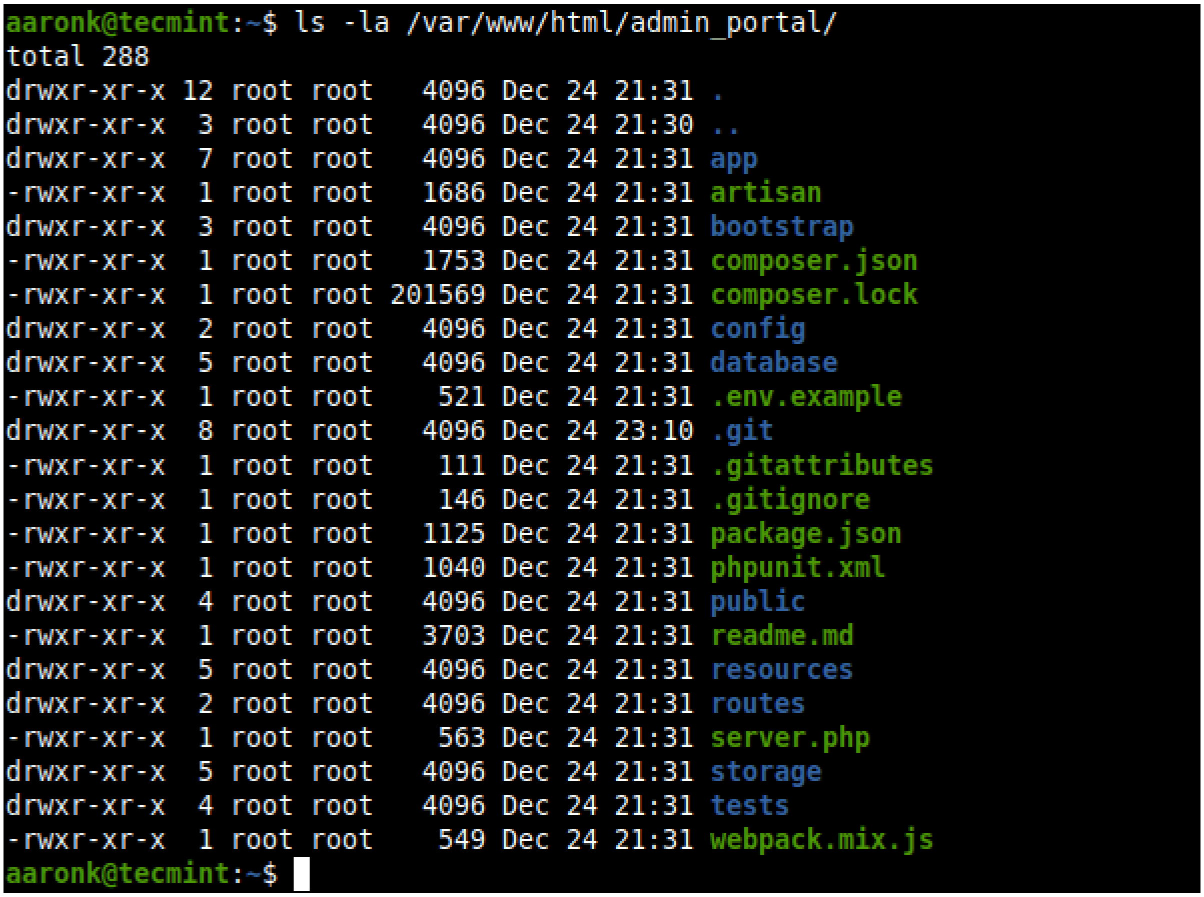
To change permissions, click Edit.

Permissions for Users	Allow	Deny
Full control		
Modify		
Read & execute	✓	
List folder contents	✓	
Read	✓	
Write	✓	

For special permissions or advanced settings, click Advanced.

Source: https://answers.microsoft.com/en-us/windows/forum/all/

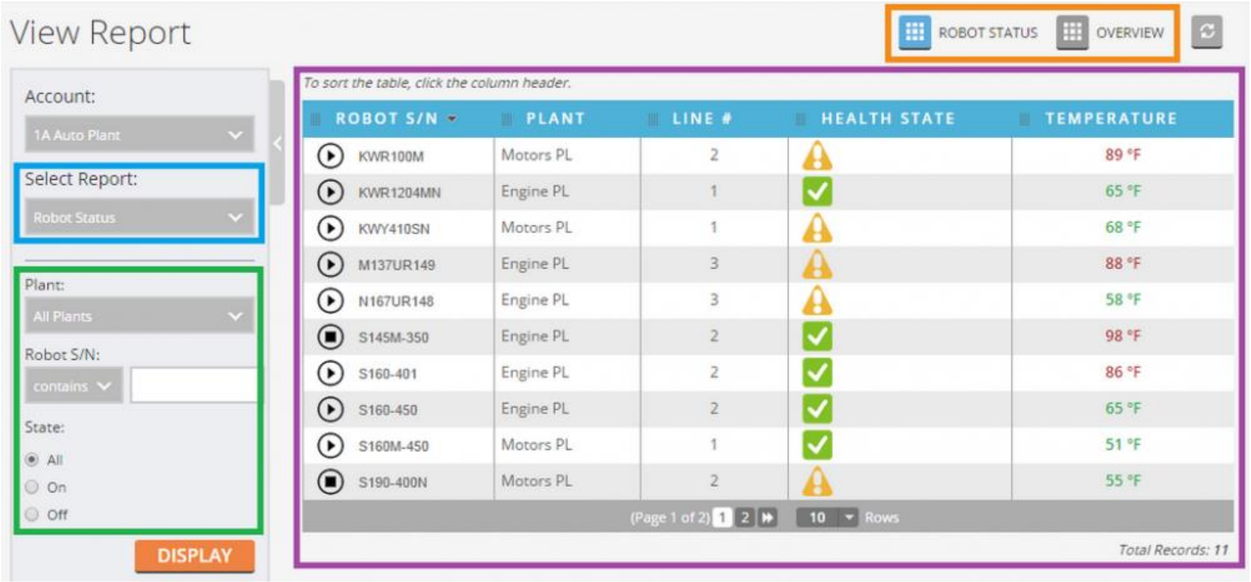
2. List all files with detailed information
   Command: ls -la, while -a includes hidden files.



```
aaronk@tecmint:~$ ls -la /var/www/html/admin_portal/
total 288
drwxr-xr-x 12 root root   4096 Dec 24 21:31 .
drwxr-xr-x  3 root root   4096 Dec 24 21:30 ..
drwxr-xr-x  7 root root   4096 Dec 24 21:31 app
-rwxr-xr-x  1 root root   1686 Dec 24 21:31 artisan
drwxr-xr-x  3 root root   4096 Dec 24 21:31 bootstrap
-rwxr-xr-x  1 root root   1753 Dec 24 21:31 composer.json
-rwxr-xr-x  1 root root 201569 Dec 24 21:31 composer.lock
drwxr-xr-x  2 root root   4096 Dec 24 21:31 config
drwxr-xr-x  5 root root   4096 Dec 24 21:31 database
-rwxr-xr-x  1 root root    521 Dec 24 21:31 .env.example
drwxr-xr-x  8 root root   4096 Dec 24 23:10 .git
-rwxr-xr-x  1 root root    111 Dec 24 21:31 .gitattributes
-rwxr-xr-x  1 root root    146 Dec 24 21:31 .gitignore
-rwxr-xr-x  1 root root   1125 Dec 24 21:31 package.json
-rwxr-xr-x  1 root root   1040 Dec 24 21:31 phpunit.xml
drwxr-xr-x  4 root root   4096 Dec 24 21:31 public
-rwxr-xr-x  1 root root   3703 Dec 24 21:31 readme.md
drwxr-xr-x  5 root root   4096 Dec 24 21:31 resources
drwxr-xr-x  2 root root   4096 Dec 24 21:31 routes
-rwxr-xr-x  1 root root    563 Dec 24 21:31 server.php
drwxr-xr-x  5 root root   4096 Dec 24 21:31 storage
drwxr-xr-x  4 root root   4096 Dec 24 21:31 tests
-rwxr-xr-x  1 root root    549 Dec 24 21:31 webpack.mix.js
aaronk@tecmint:~$
```

Source: https://www.tecmint.com/list-files-ordered-by-size-in-linux/

3. Copy assignment2.txt to bn104 directory
   Command: cp assignment2.txt bn104/
4. View report.txt page by page
   Command: less report.txt



View Report

ROBOT STATUS OVERVIEW

Account:
1A Auto Plant

Select Report:
Robot Status

Plant:
All Plants

Robot S/N:
contains

State:
● All
○ On
○ Off

DISPLAY

To sort the table, click the column header.

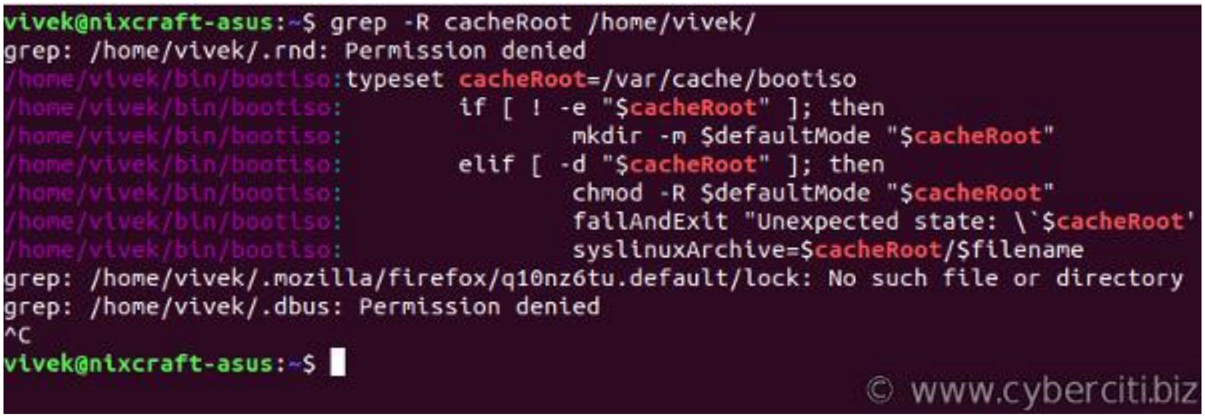
ROBOT S/N	PLANT	LINE #	HEALTH STATE	TEMPERATURE
▶ KWR100M	Motors PL	2	⚠	89 °F
▶ KWR1204MN	Engine PL	1	✓	65 °F
▶ KWY410SN	Motors PL	1	⚠	68 °F
▶ M137UR149	Engine PL	3	⚠	88 °F
▶ N167UR148	Engine PL	3	⚠	58 °F
■ S145M-350	Engine PL	2	✓	98 °F
▶ S160-401	Engine PL	2	✓	86 °F
▶ S160-450	Engine PL	2	✓	65 °F
▶ S160M-450	Motors PL	1	✓	51 °F
■ S190-400N	Motors PL	2	⚠	55 °F

(Page 1 of 2) 1 2 ⏩ 10 Rows

Total Records: 11

Source: https://help.autodesk.com/cloudhelp/ENU/FUSIONCONNECT-Help/UserGuide/View_Reports.html

5. Search for string issue in file.txt
   Command: grep issue file1.txt



```
vivek@nixcraft-asus:~$ grep -R cacheRoot /home/vivek/
grep: /home/vivek/.rnd: Permission denied
/home/vivek/bin/bootiso:typeset cacheRoot=/var/cache/bootiso
/home/vivek/bin/bootiso:        if [ ! -e "$cacheRoot" ]; then
/home/vivek/bin/bootiso:                mkdir -m $defaultMode "$cacheRoot"
/home/vivek/bin/bootiso:        elif [ -d "$cacheRoot" ]; then
/home/vivek/bin/bootiso:                chmod -R $defaultMode "$cacheRoot"
/home/vivek/bin/bootiso:                failAndExit "Unexpected state: \`$cacheRoot'
/home/vivek/bin/bootiso:                syslinuxArchive=$cacheRoot/$filename
grep: /home/vivek/.mozilla/firefox/q10nz6tu.default/lock: No such file or directory
grep: /home/vivek/.dbus: Permission denied
^C
vivek@nixcraft-asus:~$ 
```

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Source: https://www.cyberciti.biz/faq/howto-search-find-file-for-text-string/

Question 10:

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