**Level 1: Windows File Systems**

Refer to the following document when answering the questions for Level 1.

<https://fossbytes.com/fat32-vs-ntfs-vs-exfat-difference-three-file-systems/>

1. What is the definition of a file system?  
   The definition of a file system is a list of systems that make decisions of how data is stored in a storage device like a hardrive.
2. What are the three file systems used on Windows computers?  
   The 3 file systems on Windows computers are FAT32, NTFS and exFAT.
3. What are the properties of the FAT file system?
   1. The FAT file system was the original Windows 95 file system. When was it introduced?

The FAT (File Allocation Table) system was introduced in 1977.

* 1. How is the FAT16 file system different from the FAT32 file system?

The FAT16 file system is different from FAT32 file system because it offers less volume size than the FAT32 system.

* 1. What is the file size limit of the FAT32 file system?

The file size limit of the FAT32 file system is 4GB.

* 1. What is the disk size limit of the FAT32 file system?

The disk size limit of the FAT32 file system is 16TB.

* 1. What other devices currently use the FAT file system?

Other devices that currently use the FAT file system are storage systems, for example flash drives, but you need to make sure that no individual file is above 4GB. It’s implemented in gaming consoles, HDTVs, DVD and Blu-Ray players and any other device with USB ports. All Windows, Linux, Apple’s Mac OS systems also uses the FAT system.

1. What are the properties of the NTFS file system?
   1. The NTFS file system is what is used on current Windows computers. When was it introduced?

The NTFS (New Technology File System) system was introduced in 1993.

* 1. How is the NTFS file system different from the FAT file system?

The NTFS file system it has read only compatibility Windows, Mac and Linux and Microsoft Xbox One. Limitless storage has limited cross platform compatibility and is best used in internal hard drives. The FAT32 is compatible with Windows, Mac, Linux, gaming consoles and any other device with a USB port. It can work with other platforms, it has limited storage and is used in removable devices.

* 1. What is the file size limit of the NTFS file system?

The file size limit of the NTFS file system has no limit.

* 1. What is the disk size limit of the NTFS file system?

The disk size limit of the NTFS file system has no limit.

* 1. What are some notable features of the NTFS file system?

Some notable features of the NTFS file system is that it has reparse points, sparse file support, disk usage quotas, distributed link tracing, and file-level encryption. It can also support backward compatibility with older versions.

* 1. What are some limitations regarding how other devices support the NTFS file system?  
     Some limitations is that Apple’s Mac OSX provides read only support while Linux provide little variants for NTFS.

1. Provide a summary of the exFAT file system.

The exFAT fie system picks up where the FAT32 system can’t continue. Most modern digital cameras have the exFAT in their SDXC memory cards. The exFAT file system is pre-formatted in high capacity SDXC memory cards. Microsoft is currently in the lead for US Patent in having Quick File Name Lookup using Name hash. This method speed up the search speed, it hasn’t been released to exFAT file system yet because the vendors need to get a restricted license form Microsoft. Microsoft wants to make it available for free, but this lead to custom versions being made for other companies like Linux called exFAT fuse which allows users to read/write. Samsung also made its own implementation but was leaked on Github by accident, later the update was made official. It got launched in 2006, it has a file system of 16EB like the NTFS, but its more lighter because it doesn’t have extra pieces like NTFS. It provide full read and write support for Mac, Android, Windows, but for Linux the appropriate software works to support it.

**Level 2: Windows NTFS Permissions**

Refer to the following document when answering the questions for Level 2.

<http://www.ntfs.com/ntfs-permissions.htm>

1. Read the information provided on the “Setting Permissions” page.
   1. Summarize how to view and set file and folder permissions.

First you open Windows Explorer and then right click a file or folder. After that choose Properties from context menu. Then the properties dialog box will appear then you click on the security tab. Under group, or user names you select or add a group. At the bottom you can deny or allow the available permissions.

1. Read the information provided on the “Advanced Permissions” page.
   1. List the advanced permissions that affect files.

The advanced permissions that affect files are Read Attributes, Read Extended Attributes, Creates Files/Write Data, Write Attributes, Write Extended Attributes, Delete Subfolders and Files, Delete, Read Permissions, Change Permissions, Take Ownership and Synchronize.

* 1. List the advanced permissions that affect folders.

The advanced permissions that affect folders are Traverse Folder, List Folder, Read Attributes, Read Extended Attributes, Creates Files/Append Data, Write Attributes, Write Extended Attributes, Delete Subfolders and Files, Delete, Read Permissions, Change Permissions, Take Ownership and Synchronize.

1. Read the information provided on the “Basic Permissions” page.
   1. The basic permissions are listed at the top of the columns in the table. List the 6 basic permissions.

The 6 basic permissions are Basic Full Control, Basic Modify, Basic Read and execute, Basic List Folder Contents, Basic Read and Basic Write.

* 1. What basic permissions allow a user to write data to a file?

The basic permissions that allows a user to write data to a file is Take Ownership.

* 1. What basic permissions allow a user to delete a folder?  
     The basic permissions that allows a user to delete a folder is Basic Full Control and Basic Modify.

1. Why do you think there are separate permissions for reading and writing a file? Provide an example where you might want somebody to read a file but not be able to change it.

For example if the teacher gives and exam review for the whole class to look at, the teacher most likely doesn’t want you to write the answers on the sheet because then everyone could see it. So the teacher will only everyone to read it only. That’s why there’s 2 separate commands for reading and writing for a file because sometimes may not want the file to be edited because no one will do the work or for other reasons.

1. Why do you think there are separate permissions for listing folders and reading files? Provide an example where you might want somebody to be able to list a folder but not be able to read a file in the folder.

You need separate permissions for listing folder and reading folders because you might want to just look at the folder names and not look at the contents. This will be useful for when you need to look for a specific folder.

**Level 3: Windows Share Permissions**

Refer to the following document when answering the questions for Level 3.

<https://blog.netwrix.com/2018/05/03/differences-between-share-and-ntfs-permissions/>

1. What are share permissions?
   1. Who do share permissions affect?

Share permissions affect how users can view, use or read files that they have access to.

* 1. Who do share permissions not affect?

Share permissions don’t affect users that log on locally.

* 1. Summarize the 3 types of share permissions.  
     The read permission allows the user to view subfolders, files, read data and run programs. The change permission allows everything you can do in the read permission, but you can also add subfolders, change data and delete files. The full control permission allows everything you can do in the read and change permission, but it can also change NTFS files and folders only.

1. Summarize the main difference between NTFS and Share Permissions.

NTFS has more control over the files and its contents while share permissions are easier to use and manage. Share permissions are more portable unlike NTFS. Share permissions are placed in the ‘Advanced Share’ properties in the ‘Permissions’ settings. Unlike share permissions which are placed in the Security Tab.

1. Summarize how to view and change share permissions.

You first need to click on the shared folder, then click on properties, open the sharing tab where you click on advanced sharing and the click on permissions. Then you select a user group and either click ‘Allow’ or ‘Deny’ and you’re done.

**Level 4: Your Files and Folders**

1. Organized your files and folders on your network drive to match your GitHub repository.
   1. Create a folder on your student drive for Computer Science Work
   2. Create sub-folders (e.g. Topic A, etc.) to match the folders on your GitHub repository
   3. Move your answer files and other work you have done for this course into the proper sub-folders.
   4. Show your organized folders/files to Mr. Nestor