**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?  
   A file system is a various number of rules that are used to make decisions on how to open and access files in a storage device. Examples of storage devices are flash drives and hard drives.
2. What are the three file systems used on Windows computers?  
   The three file systems used 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 system was introduced in August 1995. It was released at the time with the Windows 95 operating system.

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

The FAT16 file system is different from the FAT32 file system because it offers a smaller volume size.

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

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

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

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

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

The devices that currently use the FAT file system are flash drives, HDTVs, DVD & Blu-Ray players. Also, any device that has a USB port uses the FAT file 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 file system was introduced in the year 1993. This file system was introduced with the Windows NT 3.1 operating system.

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

The NTFS file system is different than the FAT file system because it offers a much larger capacity for storage. Unlike the FAT file system, the NTFS file system does not offer compatibility for a wide range of platforms.

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

The file size limit of the NTFS file system is 16 Exabytes (EB).

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

The disk size limit of the NTFS file system is 256 Terabytes (TB).

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

Some notable features of the NTFS file system are file level encryption, reparse points, link tracking, support for sparse files, and disk usage quotas. This information was gathered from the website document.

* 1. What are some limitations regarding how other devices support the NTFS file system?  
     Some limitations regarding how other devices support the NTFS file system are that read only support for Linux is limited to only a few variants. Read only NTFS formatted drives are supported by the Mac OSX.

1. Provide a summary of the exFAT file system.

The exFat file system is short form for Extended FAT and it is commonly used for modern day digital cameras. Files with a size more than 4 GB are supported and the exFAT file system is formatted in SDXC file systems. Reading and writing operations of the NTFS file system are available on distributions of Linux which is called exfat-fuse. The exFAT file system also has 16 EB of file size storage and it was launched in the year 2006. Operating systems with the names Windows, Mac, and Android support reading and writing for this file system.

**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.

To view folder permissions, right click a file in Windows Explorer and click on “Properties” in the context menu. To set file and folder permissions, click on the “Security” tab. After that, select a user or a group under the “Group or user name”

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

Advanced permissions that affect files:

* Execute File
* Read Data
* Read attributes
* Create Files
* Write Data
* Append Data
* Write Attributes
* Write Extended Attributes
* Delete Files
* Delete
* Read Permissions
* Change Permissions
* Take Ownership
* Synchronize
  1. List the advanced permissions that affect folders.

Advanced permissions that affect folders:

* Traverse Folder
* List Folder
* Read Attributes
* Read Extended Attributes
* Create Folders
* Write Attributes
* Write Extended Attributes
* Delete Subfolder
* Delete
* Read Permissions
* Change Permissions
* Take Ownership
* 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 & 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 allow a user to write data to a file are “Traverse Folder/Execute File”, “List Folder/Read Data”, “Read Attributes”, “Read Extended Attributes”, “Delete Subfolders and Files”, “Delete”, “Change Permissions”, and “Take Ownership”.

* 1. What basic permissions allow a user to delete a folder?  
     The basic permissions that allow a user to delete a folder are “Delete Subfolders and Files” and “Delete”.

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.  
   I think that there are separate permissions for reading and writing a file so that a public user does not change the content of a file that belongs to the owner. An example of wanting somebody to read a file but not allowing them to change it would be looking at a website on the internet.
2. 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.

I think that there are separate permissions for listing folders and reading files because folders may contain confidential files inside of them. An example of wanting somebody to be able to list a folder but not allowing them to change it can be a student searching for lessons and not being allowed to access a folder that contains files of an exam or test.

**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 the number of access to files and folders that are shared.

* 1. Who do share permissions not affect?

Share permissions do not affect the control access of Subfolders or objects that are shared.

* 1. Summarize the 3 types of share permissions.

Read share permission: The users can run programs, read the data inside files, and view the names of Subfolders. “Read” permissions are given to the “Everyone” group in default.

Change share permission: The Change Permission is not given in default but with the “Read” permission, all of the users are allowed to do everything that is allowed. This means that they are allowed to add, change, and delete files and Subfolders.

Full control share permission: The “Change” and “Read” permissions grant full access to users. They can only change permissions for files and folders of NTFS. The “Full Control” permissions are given to the “Administrators” group by default.

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

The NTFS permissions are more advanced in allowing control for shared folders but the share permissions are easier to control and apply. NTFS permissions can not be used when sharing folders with the FAT32 AND FAT file systems but share permissions do. Share permissions do not apply to locally logged on users but permissions of NTFS do. NTFS permissions do not allow you to restrict the number of concurrent connections to folders that are shared but Share permissions do. The Security tab enables permissions for the NTFS permissions and the “Advanced Sharing” properties in the settings of “Permissions” enable Share permissions.

1. Summarize how to view and change share permissions.

First, you must open the “Security” tab, click “edit” in the dialog box called “Properties” which can be found in the folder. Next, the thing that you want to change the permissions for can be clicked on. For the settings, click on “Allow” or “Deny”. After, click on the “Apply” button to approve the permissions.

**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