**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 basically a set of rules used to decide how data is stored and fetched in a storage device, be it a hard drive, flash drive, or something else. A file system is basically a set of rules used to decide how data is stored and fetched in a storage device, be it a hard drive, flash drive, or something else.
2. What are the three file systems used on Windows computers?

Three file systems that are on windows computers are the FAT32, NTFS, exFAT.

1. 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) file system was introduced in the year 1977.

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

The FAT32 file system has a larger volume size and allows you to store up 4 GB. Its maximum disk size is 16TB.

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

The file size limit is 4GB.

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

The disk size limit is 16TB.

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

Other devices that currently use this file system include gaming consoles, HDTVs, DVD and Blu-Ray players and many device with a USB port.

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 1993.

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

The NTFS has inexhaustible file size limits, whereas the FAT file system has a limit of 4GB.

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

The file size limit of this file system is 16EB.

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

The disk size limit is 256TB.

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

Some notable features of the system are reparse point, sparse file support, disk usage quotes, distributed link tracking, and file-level encryption.

* 1. What are some limitations regarding how other devices support the NTFS file system?

A NTFS-formatted drive can only be read on Apple’s Mac OSX and Linux are able to provide write support for NTFS.

1. Provide a summary of the exFAT file system.

Digital cameras, high capacity SDXC memory cards all use exFAT. It is light weight compared to NTFS. It also has a larger file size than 4GB. Microsoft uses the US Patent 8321439 for Quick File Name Lookup using name hash. This method escalates file search speed. However, Microsoft has not released a complete specification set of exFAT. For this the vendors need a restricted license from Microsoft. This means vendors that are a part of an open-source operating system or a commercial software cannot implement the exFAT file system. The exFAT file system has the same 16 EB file size limit as NTFS, but being way lighter. It does not contain extra features unlike the NTFS. Mac allows full read and write support

**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.

Firstly, to find properties, right-click a file, folder or volume which will display context menu with ‘Properties’ as one of the options. Secondly, click the security tab. Then under the ‘Group’ or ‘usernames’ select or add a group or user. Lastly, at the bottom you can allow or deny permissions.

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

-Execute File

-Read Data

-Read Attributes

-Read Extended Attributes

-Create Files/Write Data

-Append Data

-Write Attributes

-Write Extended Attributes

-Delete Subfolders and Files

-Read Permissions

-Change Permissions

-Take Ownership

* 1. List the advanced permissions that affect folders.

-Traverse Folder

-List Folder

-Read Attributes

-Read Extended Attributes

-Create Folders]

-Write Attributes

-Write Extended Attributes

-Delete

-Read Permissions

-Change Permissions

-Take Ownership

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.

-Basic Full Control

-Basic Modify

-Basic Read and Execute

-Basic List Folder Contents

-Basic Read

-Basic Write

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

Basic Full Control, Basic Modify, and Basic Write

* 1. What basic permissions allow a user to delete a folder?  
     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.  
   There are separate permissions for reading and writing because sometimes you just want someone to view the file and read and understand the content and not actually be able to change it. An example of this would be when there is a scientific Data Base. One will only want people to read it not change it, because if they do it will mess with the facts and the wrong information will get out.
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.

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.

There are separate permissions for listing folders and reading files because sometimes someone does not want anyone to read the files only list the folders. This could be because the folders have sensitive information on them and access cannot be granted to certain individuals. This could be what they government does. Folders may be listed but permission to read the files may not be given.

**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 users that the folders are shared with. The number of users that can view them could be controlled.

* 1. Who do share permissions not affect?

Share permissions do not apply to Users who locally log on.

* 1. Summarize the 3 types of share permissions.

Read: Users are only allowed to view folders and files. They can read its contents but cannot modify it.

Change: Users can read and view contents of files and folders. They can also edit content, add more files and subfolders and delete them.

Full Control: Users can do everything in the “Read” and “Change” permissions. They are also allowed to change permissions for NTFS files and folders. The “Administrators” group is given “Full Control” permission.

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

* NFTS permissions are more complex to manage, whereas Share permissions are much easier to apply and manage.
* NTFS permissions cannot be used to share FAT and FAT32 folders, Share permissions can be.
* NTFS permissions apply to users who are logged on to the server locally, Share permissions are not.
* Share permissions allow to restrict the number of concurrent connections to a shared folder, NFTS does not.
* Share permissions are configured in the “Advanced Sharing” properties in the “Permissions” settings. NTFS permissions are configured on the Security tab in the file or folder properties.

1. Summarize how to view and change share permissions.
2. Right-click the shared folder.
3. Click “Properties”
4. Open the “Sharing” tab
5. Click “Advanced Sharing”
6. Click “Permissions”
7. Select a user or group from the list
8. Select either “Allow” or “Deny” for each of the settings.

**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