**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.

1. What are the three file systems used on Windows computers?  
   FAT32, NTFS, exFAT
2. 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 story started in 1977 with the original 8-bit FAT file system intended

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

FAT32 surmounted the limited volume size offered by the FAT16 file system.

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

FAT32 allows you to store files of size up to 4GB and

What is the disk size limit of the FAT32 file system?

The maximum disk size can go up to 16TB

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

Microsoft’s Standalone Disk Basic-80 currently use 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?

NTFS (New Technology File System) was introduced in 1993 with their Windows NT 3.1 operating system coming into existence.

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

NTFS file system offers inexhaustible file size limits. FAT file does not offer it.

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

16 EB – 1KB which is 18,446,744,073,709,550,592 bytes

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

NTFS file system is only 256 TB out the whopping 16 EB

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

Notable features include reparse points, sparse file support, disk usage quotas, distributed link tracking, and file-level encryption.

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

It’s a journaling file system which proves to be an important aspect when it comes to reviving a corrupt file system.

1. Provide a summary of the exFAT file system.

The exFAT (Extended FAT) is another Microsoft proprietary file system which finds its use in ball games where the FAT32 feels out of breath. Most of the modern digital cameras use exFAT. High capacity SDXC memory cards are now pre-formatted with the exFAT file system, as it is lighter in contrast to NTFS and supports file of sizes, more than 4GB. So, if you have an exFAT SD card, you shall face no issues while copying full-length HD movies on it which is not the case with FAT32.

**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.

In Windows Explorer, right-click a file, folder or volume and choose Properties from the context menu. The Properties dialog box appears.

Click the Security tab.

Under Group or user names, select or add a group or user.

At the bottom, allow or deny one of the available permissions.

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

Traverse Folder/Execute File

Traverse Folder: Allows or denies moving through a restricted folder to reach files and folders beneath the restricted folder in the folder hierarchy. Traverse folder takes effect only when the group or user is not granted the "Bypass traverse checking user" right in the Group Policy snap-in. This permission does not automatically allow running program files.

Execute File: Allows or denies running program (executable) files.

* 1. List the advanced permissions that affect folders.

List Folder/Read Data

List Folder: Allows or denies viewing file names and subfolder names within the folder. List Folder only affects the contents of that folder and does not affect whether the folder you are setting the permission on will be listed.

Read Data: Allows or denies viewing data in files.

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 & 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

Basic Write

* 1. What basic permissions allow a user to delete a folder?

Basic Full Control

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.  
   Full Control or the special permissions "Take Ownership" to be able to take ownership of a file or folder. Users who have the "Restore files and directories" privilege can assign ownership to any user or group.
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.

If the ownership of a file or folder needs to change, you can replace the existing owner with your own account or with one of the groups you are a member of.

**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 manage access to folders shared over a network Share permissions apply to all files and folders in the share; you cannot granularly control access to subfolders or objects on a share.

* 1. Who do share permissions not affect?

They don’t apply to users who log on locally.

* 1. Summarize the 3 types of share permissions.  
     Share permissions apply to all files and folders in the share; you cannot granularly control access to subfolders or objects on a share.

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

hare permissions are easy to apply and manage, but NTFS permissions enable more granular control of a shared folder and its contents. When share and NTFS permissions are used simultaneously, the most restrictive permission always wins. For example, when the shared folder permission is set to “Everyone Read Allow” and the NTFS permission is set to “Everyone Modify Allow”, the share permission applies because it is most restrictive; the user is not allowed to change the files on the shared drive. Share permissions can be used when sharing folders in FAT and FAT32 file systems; NTFS permissions can’t. NTFS permissions apply to users who are logged on to the server locally; share permissions don’t. Unlike NTFS permissions, share permissions allow you to restrict the number of concurrent connections to a shared folder. 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.

Open the “Security” tab.

In the folder’s “Properties” dialog box, click “Edit”.

Click on the name of the object you want to change permissions for.

Select either “Allow” or “Deny” for each of the settings.

Click “Apply” to apply 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