# HOW TO ENABLE CASE SENSITIVITY ON NTFS GUIDED EXERCISE

APFS (Apple File System), the file system used by both iOS and Mac Operating Systems, is case sensitive. NTFS (New Technology File System), a file system used for Windows OSs, is case insensitive. As such, iOS images often contain files that conflict when extracted from an archive such as a GrayKey Full File System extraction. During Hexordia's HMFA class in March 2023, a student ran into this exact issue while using a Windows Machine to extract the Magnet User Summit 2022 iOS 15 Full File System image. The iOS image contains two PList files in the same directory with the same name, but with differences in capitalization; namely, com.apple.Prefernces.plist and com.apple.preferences.plist. After the class, Troy Schnack wrote a blog regarding the issue, which can be found here https://troy4n6.blogspot.com/2023/03/try-to-be-more-sensitive.html. Microsoft has additional information regarding case sensitivity here:https://learn.microsoft.com/en-us/windows/wsl/case-sensitivity.

To deal with iOS images on an NTFS partition, the destination folder for the extracted contents needs to be case sensitive. To set case sensitivity on a Windows machine, open the command prompt as an administrator.
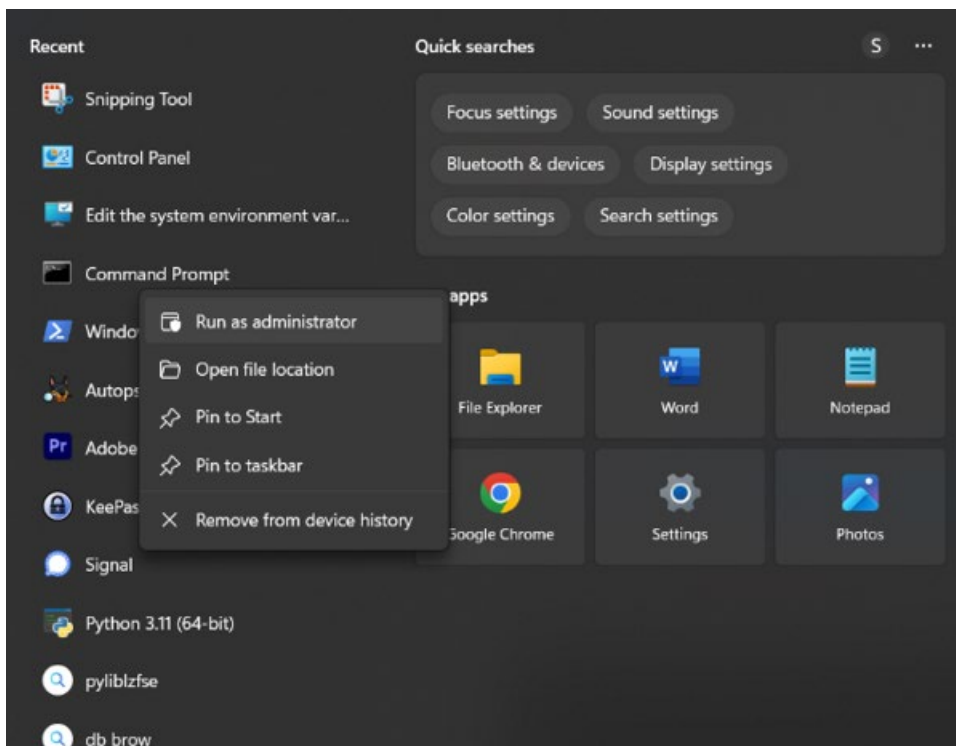
Create a folder that has no content in it on the drive that the zip file will be extracted. Run command "fsutil.exe file SetCaseSensitiveInfo <insert path> enable" and hit "enter". Be sure to use the path from the folder that is being updated.

```
Microsoft Windows [Version 10.0.22621.1992]
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C:\Windows\System32>fsutil.exe file SetCaseSensitiveInfo C:\Users\sarah\Desktop\Test
Case sensitive attribute on directory C:\Users\sarah\Desktop\Test is enabled.

C:\Windows\System32>
```

There should be a resulting "reply" in the command prompt that says "Case sensitive attribute on directory <path> is enabled."

**To test case sensitivity, navigate to the folder that was just programmed and create two .txt files, one all lower case and one all upper case. Both files created should be present without errors.

Desktop > Test			
Name	Date modified	Type	Size
Test.txt	7/25/2023 2:10 PM	Text Document	0 KB
test.txt	7/25/2023 2:10 PM	Text Document	0 KB

Once these steps have been completed, we can now extract the zip file from the iOS image.
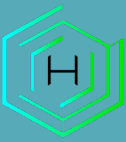
USING 7ZIP GUIDED EXERCISE

TO START, PLEASE DOWNLOAD 7ZIP FROM https://www.7-zip.org/download.html

Prior to installation, verify the hash value to the known good value from the syllabus for students enrolled in the HMFA Virtual Live course. The MD5 hash value for the 7z2201-x64.exe is a6a0f7c173094f8dafef996157751ecf

Select the file to be extracted. Right click on file, select "7-zip" and then "Extract Here".
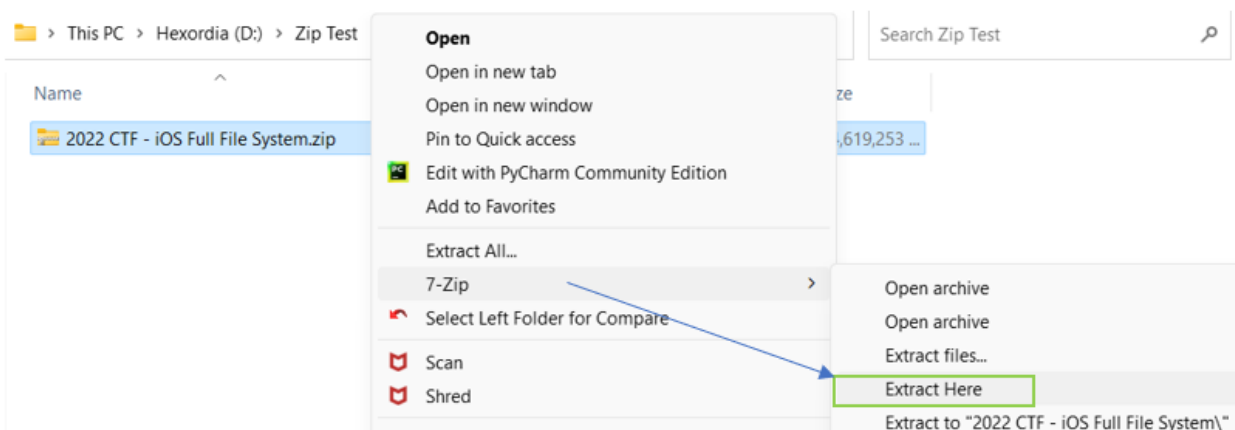
The extraction may take a few minutes to complete as this is a Gray Key extraction and contains multiple types of files, as well as a pdf file about the extraction. The forensic image itself is a compressed file. The .zip file can be loaded into many tools, such as iLEAPP. However, in order to fully navigate in tools like Autopsy, it is necessary to extract the .zip file so that the contents can be loaded.
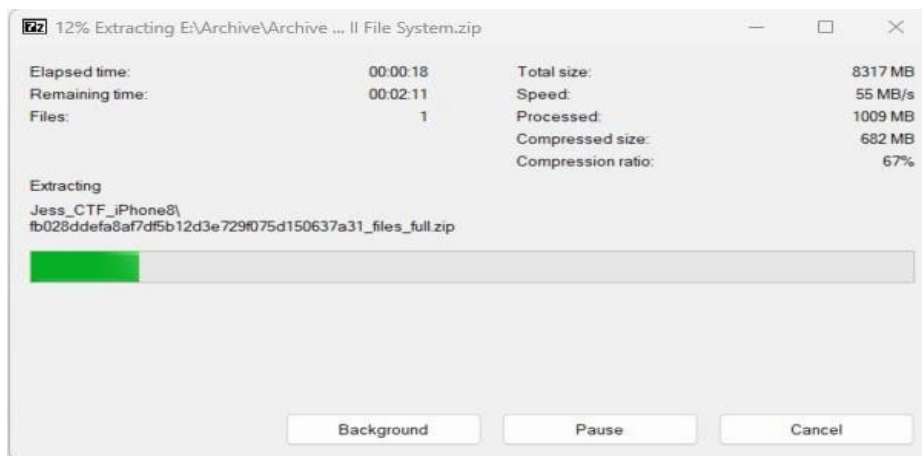
Double click or right click and select "open" the extracted file to open its contents.

There is another zipped file within this folder that needs to be extracted.
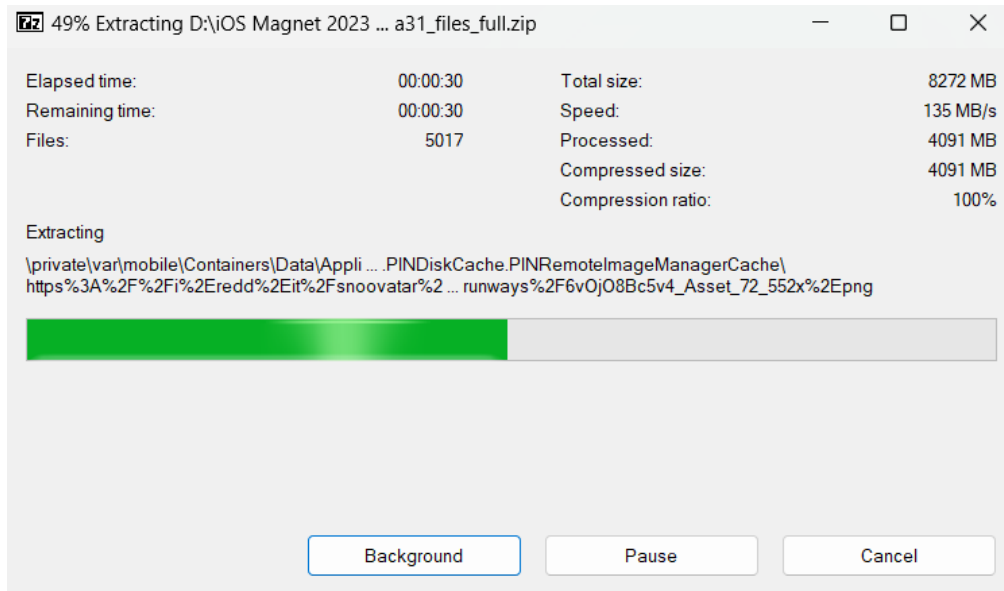

Repeat the first step, right click and select "7-zip" and then "Extract File"
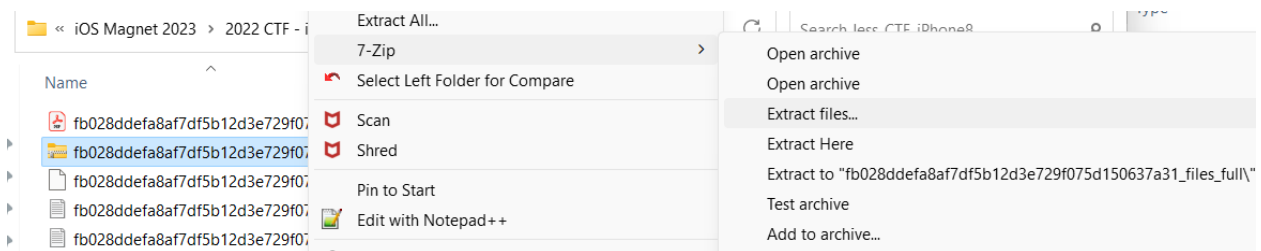
Now select the path for "Extract to" and select the folder that was programmed for case sensitivity.
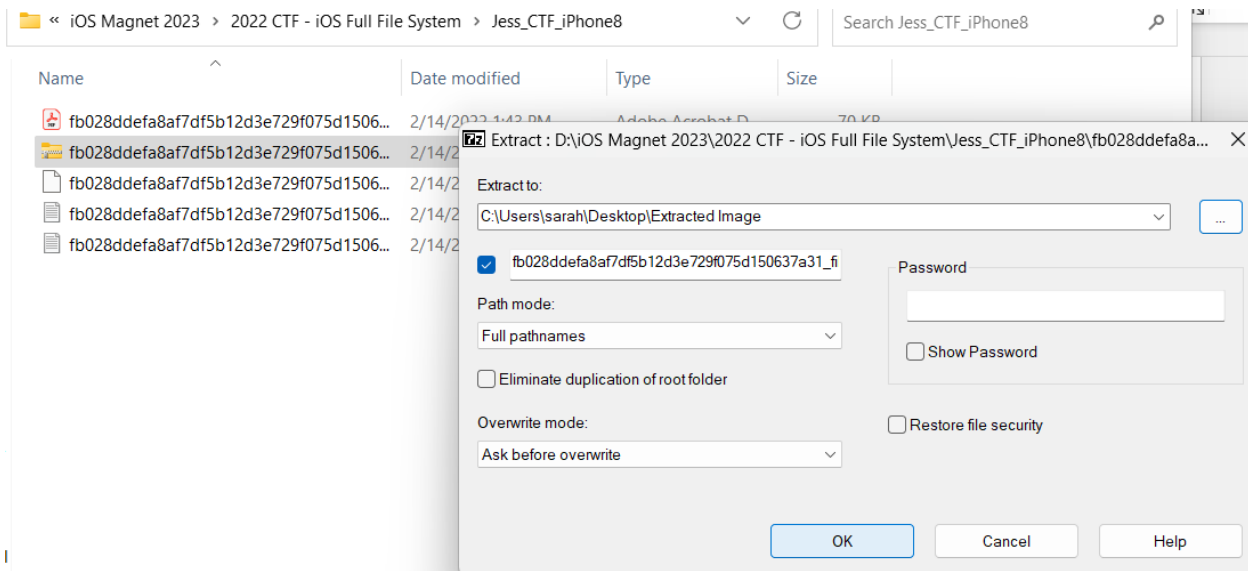
This may take a few minutes to complete.

Resulting Folder - the folder should still be called fb028ddefa8af7df5b12d3e729f075d150637a31_files_full just in an unzipped state.

Name	Date modified
Desktop > Extracted Image	
📁 fb028ddefa8af7df5b12d3e729f075d150637a31_files_full	7/25/2023 1:08 PM

Once complete, double check path fb028ddefa8af7df5b12d3e729f075d150637a31_files_full\private\var\mobile\Library\Preferences to make sure both files were unzipped.

com.apple.Preferences.plist	2/14/2022 12:06 PM	PLIST File	2 KB
com.apple.preferences.plist	1/6/2022 5:41 PM	PLIST File	1 KB

Once these steps have been completed, this forensic image can be processed in Autopsy. For instructions on how to process a forensic image in Autopsy please review: https://www.hexordia.com/s/Autopsy_Walkthrough_Final.pdf

TROUBLESHOOTING AND ERROR MESSAGES

EXFAT ERROR

Ensure the extraction is to an NTFS partition. If the destination folder is on an exFAT partition, fsutil.exe cannot be used to create a case sensitive folder.

```
C:\Windows\System32\cmd.e    ×    +    ∨

Microsoft Windows [Version 10.0.22621.1992]
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C:\Windows\System32>fsutil.exe file SetCaseSensitiveInfo D:\Test enable
A volume supporting case-sensitivity is required for this operation (e.g., a local REFS or NTFS volume).
```

Another way to identify if the destination folder is incorrect is if Windows prompts that there are files with the same names, that the destination already contains the same file or to select which file to keep. Upon seeing the prompt below, one should start over and ensure the destination folder is set as case sensitive using the steps in this document.
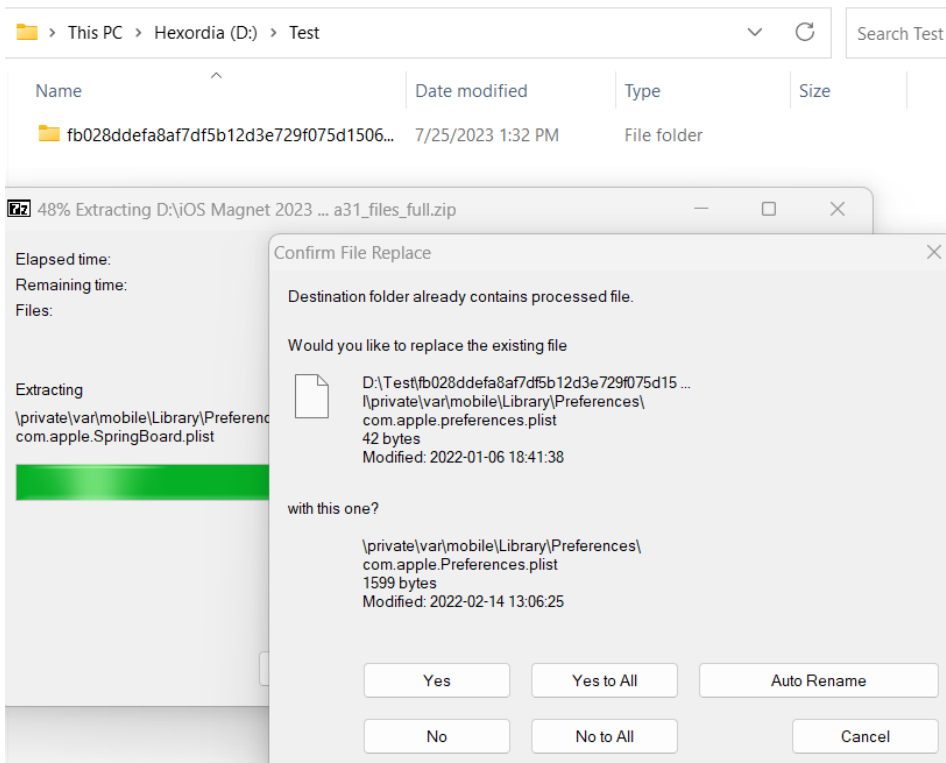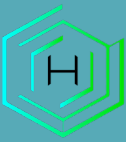
FSUTIL.EXE NOT RECOGNIZED

There may be the error "fsutil.exe file SetCaseSensitiveInfo <path> enable and an error occurs 'fsutil.exe' is not recognized as an internal or external command, operable program or batch file", then run the command again from the location that the "fsutil.exe" file is located in. Run the command from the location of the fsutil.exe file.

In the computers search type "fsutil" and select "open file location"
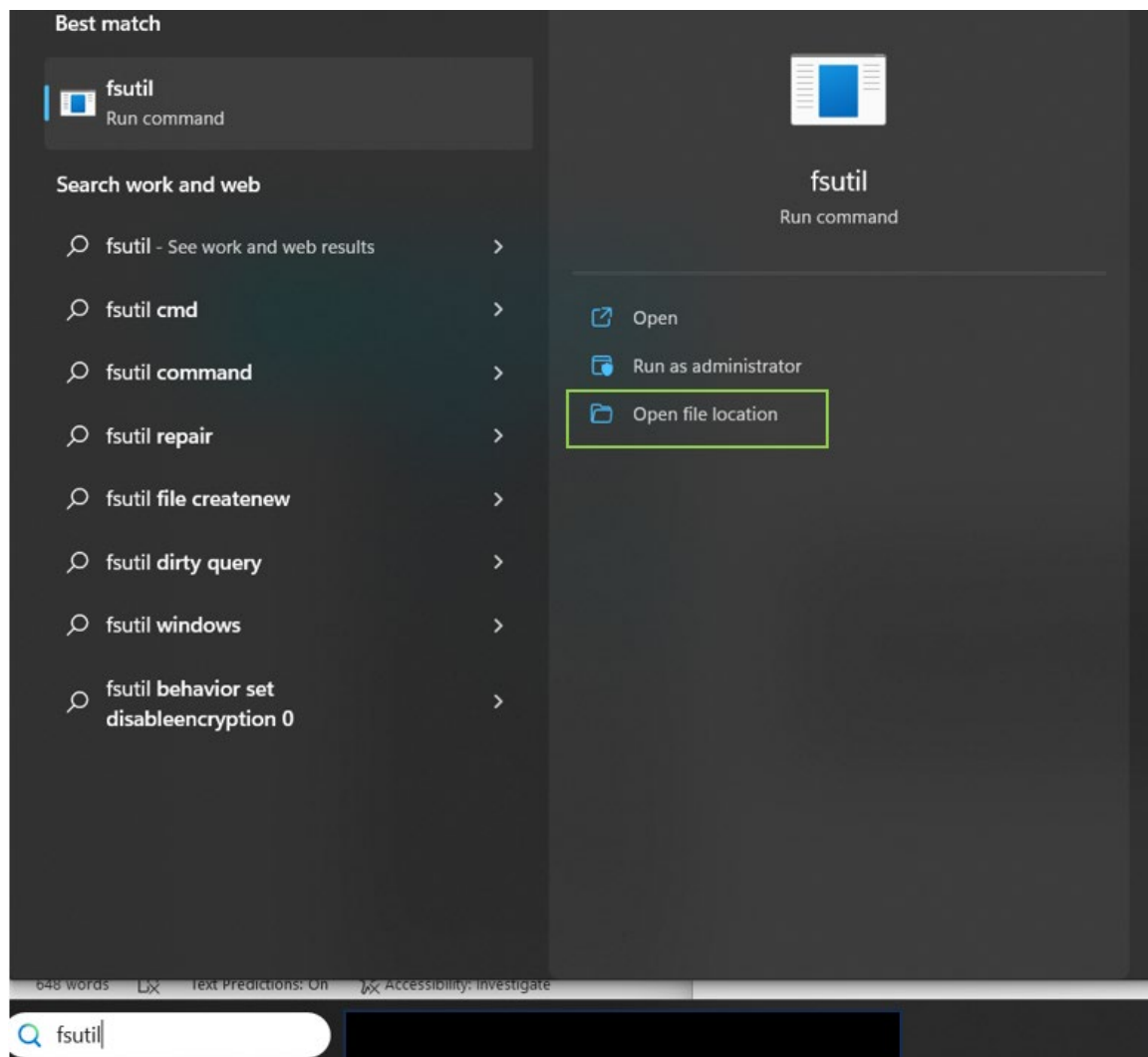
Once the location is open, in the address bar type in "cmd" to open the command prompt.
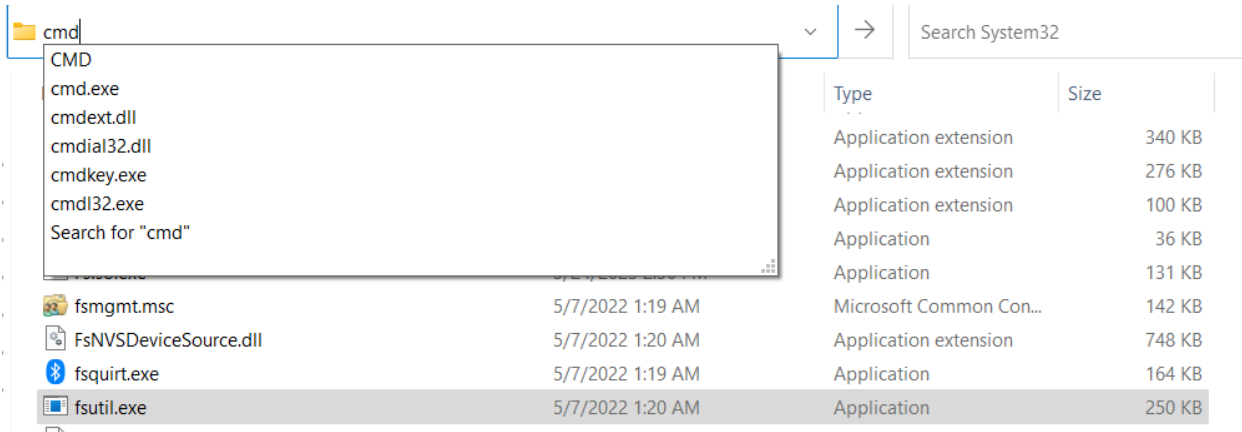
Run the command: "fsutil.exe file SetCaseSensitiveInfo <path> enable"