PC Backup Project (100 points)

The purpose of this assignment is for you to develop and implement a backup strategy to protect your data. Your backup strategy should include file level and image level solutions, as well as ensuring your data is protected in the event of a disaster. This means at least one copy of your data should be stored offsite (meaning a different location than your data is currently located). Your backup strategy should ensure that you have more than one copy of your data. You may use different backup tools for protecting different types of data, including 3rd party tools (many offer free trials).

Your backup strategy should be very detailed and document the backup process, as well as the restore /recovery process. Individuals with very little technical knowledge should be able to review your documentation and be able to perform a backup / restore. (50 points)

Once you have developed a backup strategy you must now implement your strategy. To prove implementation, you must provide screenshots showing your backup configuration and showing a test restore / recovery **(Note: Test restore may just be an individual file, you do not need to restore / recover an entire system).** (25 points)

Finally, certain applications may require specific tools for backup. This project should also include how a systems administrator would backup Microsoft Active Directory. (25 points)

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1. **<u>My critical data:</u>**
    a. **Personal Files (Computer):** Documents and photos
    b. **System Files:** OS, Apps, settings

2. **<u>Backup methods (Windows):</u>**
    a. File-Level Backup:
        i. **Windows:** Use File History to back up specific folders.
        ii. **Cloud Storage:** Use Microsoft OneDrive and Google Drive.
        iii. **Flash drive:** Use one or more USB flash drives (e.g., SanDisk) to store important files.
    b. Image-Level Backup:
        i. **Windows:** Use Windows Backup to create a system image.
        ii. **Cloud Storage:** Use Microsoft OneDrive and Google Drive.
        iii. **External Hard Drive:** Purchase external hard drive that has high capacity
    c. Offsite Backup:
        i. **Cloud Storage:** Google Drive or OneDrive are popular for offsite cloud storage.
        ii. **External Hard Drive:** A physical drive stored in a different location such as a safe cabinet with passcode, or a place that is safe.

iii. **Network Attached Storage (NAS):** Use a network-connected device for remote storage, often shows up in File Explorer.

3. **<u>Implementing backup strategy (Windows):</u>**
    a. **File-level backup:**
        i. **Identify:** The file and/or photo that needs to be backed up, or in other words, what do you think is important and that you don't want to lose.
        ii. **Decide:** Using cloud storage (Google Drive, Microsoft OneDrive), USB flash drive/hard drive, or all.
        iii. **Purchase:** Subscription for cloud storage or purchase a physical USB flash drive if necessary.
            1. The subscription plan cost will vary on the amount of capacity (storage space) you need, check the official website for a detailed plan.
            2. For USB flash drives, the higher the capacity, the better it is. Usually measured in gigabytes (GB) or terabytes (TB) in modern technology.
            3. The ranks for storage capacity: 1B (8 bits) < 1KB (1000B) < 1MB (1000KB) < 1GB (1000MB) < 1TB (1000GB) < Etc.
        iv. **For USB flash drives:** look for an USB port on an applicable device and plug it in (Usually looks like a rectangular shaped, if not the right port, the USB flash drive will not fit).
            1. After plugging in the drive, investigate the File Explorer app (Usually has an icon that looks like a yellow folder with a blue notch) for a folder that has your plugged in USB flash drive (In most cases, it shows up in the bottom of File Explorer homepage).
            2. A USB flash drive may or may not have a passcode or encryption, depending on the manufacturer, check manufacturers for details.
            3. After getting access to the flash drive, create multiple new folders on the drive, and name them whatever you want but remember what each one of them are for.
            4. After folders have been created, simply left click and hold, then drag & drop the files and/or folders you would like to be backed up into the newly created folder in the flash drive.
            5. Note that larger files take longer to be backed up, therefore give some time for those files to be backed up.
            6. Pull the flash drive out and store it in a safe place.
        v. **For cloud storage:** Create and/or login with your credentials either online via a browser or download the application to your applicable device (Downloads should be available on the applications' official website).
            1. After logging into the application(s), locate the main directory online via browser or in File Explorer (The homepage/root folder).

2. In the main directory, create multiple new folders and name them for organizing the files and/or folders that you would like to perform backup on.
3. Locate your newly created folder(s), simply left click and hold, then drag & drop the files and/or folders you would like to be backed up in that folder.
4. Note that larger files take longer to be backed up, therefore give some time for those files to be backed up.
5. After everything has been uploaded/backed up, then you're good to go.

vi. **Frequency:** For active modifying daily, file-level backup should be performed daily to what is changed for important data.
1. **Monday** has a backup of what is changed on **Sunday.**
2. **Tuesday** has a backup of what is changed on **Monday.**
3. **Wednesday** has a backup of what is changed on **Tuesday.**
4. **Thursday** has a backup of what is changed on **Wednesday.**
5. **Friday** has a backup of what is changed on **Thursday.**
6. **Saturday** has a backup of what is changed on **Friday.**
7. **Sunday** has a backup of what is changed on **Saturday.**

vii. **Retention Policy:** It's up to the backup owner on how long the copies should be kept, it'll be a huge payout if backups are adding up day by day; Might need more subscription plan and/or storage devices.
1. Could be deleting older files/folders that are not needed anymore.
2. Make sure you are deleting the right files/folders.

viii. **Test/operation:** Test the backup on a different folder, copy the existing folder that you want to perform a backup on, and paste it on a new folder, delete the copied folder and test if the backup is working.
1. On an applicable device, open File Explorer and locate the files/folders you would like to perform a backup on
2. Copy that folder using the windows copy tool (right click, select copy)
3. Paste the copied folder on a different place using the windows paste tool (e.g., different folder)
4. Either from cloud storage or USB flash drives mentioned above, access them.
5. Locate the copied files/folders and perform the backup as mentioned above.
6. After uploading/backup that specific file/folder, delete that copied file/folder on the applicable device.
7. Try to restore that from the backup you've just backed up to the cloud storage or the flash drive (Drag & drop back to File Explorer).
8. Note that larger files take longer to be restored, therefore give some time for those files/folders.

9. If it works, good to go, and if not, there's something you've done incorrectly (Go back and redo the steps once again)

b. Image-level backup:

i. **Identify:** The file and/or photo that needs to be backed up, or in other words, what do you think is important and that you don't want to lose.

ii. **Decide:** Using cloud storage (Google Drive, Microsoft OneDrive), external Hard drive, or all.

iii. **Purchase:** Subscription for cloud storage or purchase a physical external hard drive if necessary.

1. The subscription plan cost will vary on the amount of capacity (storage space) you need, check the official website for a detailed plan.
2. For external hard drives, the higher the capacity, the better it is. Usually measured in gigabytes (GB) or terabytes (TB) in modern technology.
3. The ranks for storage capacity: 1B (8 bits) < 1KB (1000B) < 1MB (1000KB) < 1GB (1000MB) < 1TB (1000GB) < Etc.

iv. **For cloud storage:** Create and/or login with your credentials either online via a browser or download the application to your applicable device (Downloads should be available on the applications' official website).

1. After logging into the application(s), locate the main directory online via browser or in File Explorer (The homepage/root folder).
2. In the main directory, create multiple new folders and name them for organizing.
3. Following the Software's Instructions, different tools have specific procedures for creating image backups. Generally, you'll need to select the drives or partitions to back up and choose a destination for the image file.
4. Note that larger files take longer to be backed up, therefore give some time for those files to be backed up.
5. After everything has been uploaded/backed up, then you're good to go.

v. **External Hard drive:** Purchase multiple hard drives with high capacity and store data in them.

1. Your external hard drive should have a USB cable, plug it into your computer's USB port and the other end should be plugged in also to your external hard drive.
2. Once done, your computer should automatically detect your external hard drive.
3. Find the "Control Panel" application and open it (On Windows, press the Windows key and search "Control Panel" on the search bar)
4. Go to System & Security > Backup & Restore > Click "Set up backup" > Select the new external drive > Choose what to backup
5. Note that image-level backup takes longer to be backed up, therefore give some time for it to be backed up.

6. For larger organizations, use multiple backup methods, such as cloud storage by purchasing subscriptions for more storage, and/or purchase more external hard drives.
7. After everything has been backed up, then you're good to go.

vi. **Frequency:** For active modifying weekly, image-level backup should be performed weekly to what is changed in that week.
    1. Over the weekend, perform image-level backup from Saturday to Sunday, image-level backup usually took a long time to process.

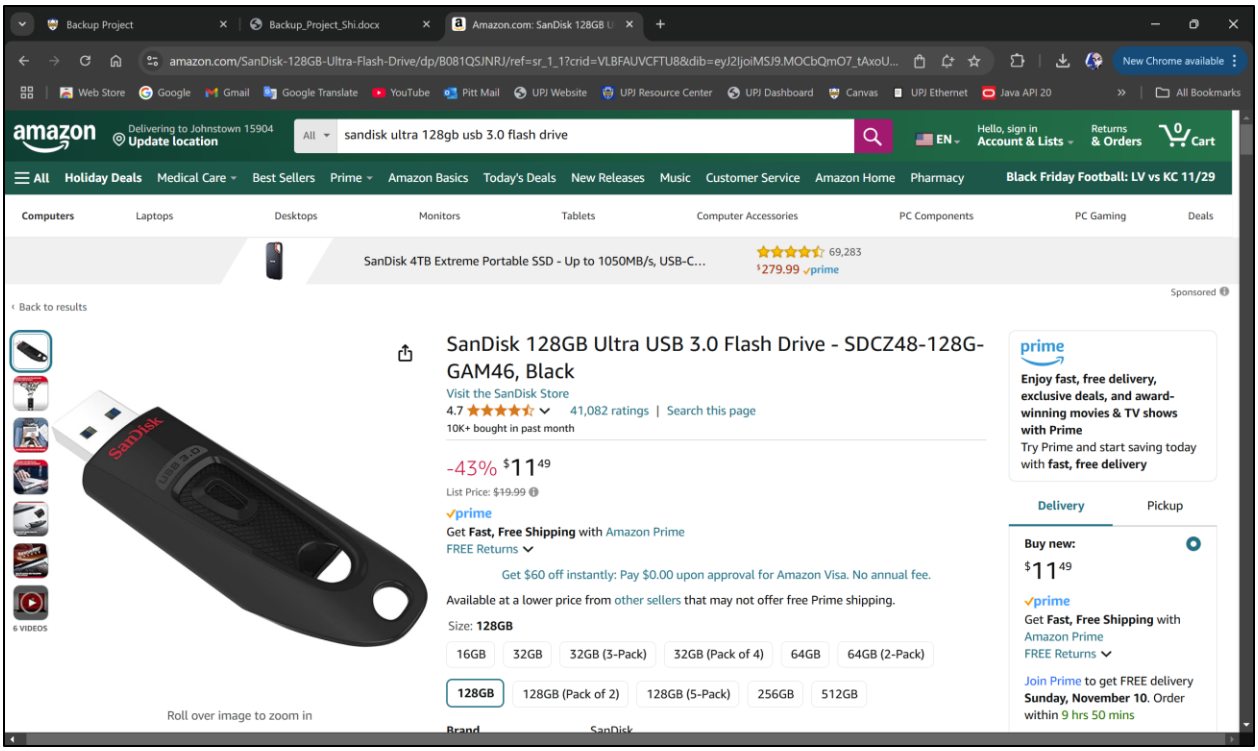
vii. **Organize:** If using hard drives, label each hard drive on which date of the update was performed. If using cloud storage, organize them by creating folders and name them by date when the backup was performed.

viii. **Retention Policy:** It's up to the backup owner on how long the copies should be kept, it'll be a huge payout if backups are adding up week by week; Will need more subscription plan and/or storage devices.
    1. Could be deleting older files/folders that are not needed anymore.
    2. Make sure you are deleting the right files/folders.

ix. **Test/operation (Windows)**: Test the backup on a different computer or use virtual machine to check if the backups are working as they should be.
    1. For cloud storage, follow instructions from the program/application for restoring from backups.
    2. For external hard drives, Press the Windows Key & search "Settings" > System > Recovery > Advanced startup > Restart now > After restart, go back to System > Troubleshoot > Advanced Options > System Image Recovery
    3. Follow the steps on Windows instruction to restore.

4. **<u>My backup and restoration plan (Microsoft Windows File-level backup):</u>**

Step 1: Purchased an USB flash drive (SanDisk Ultra USB 3.0 128GB) from Amazon



Step 2: Plug the flash drive into the USB port on a laptop

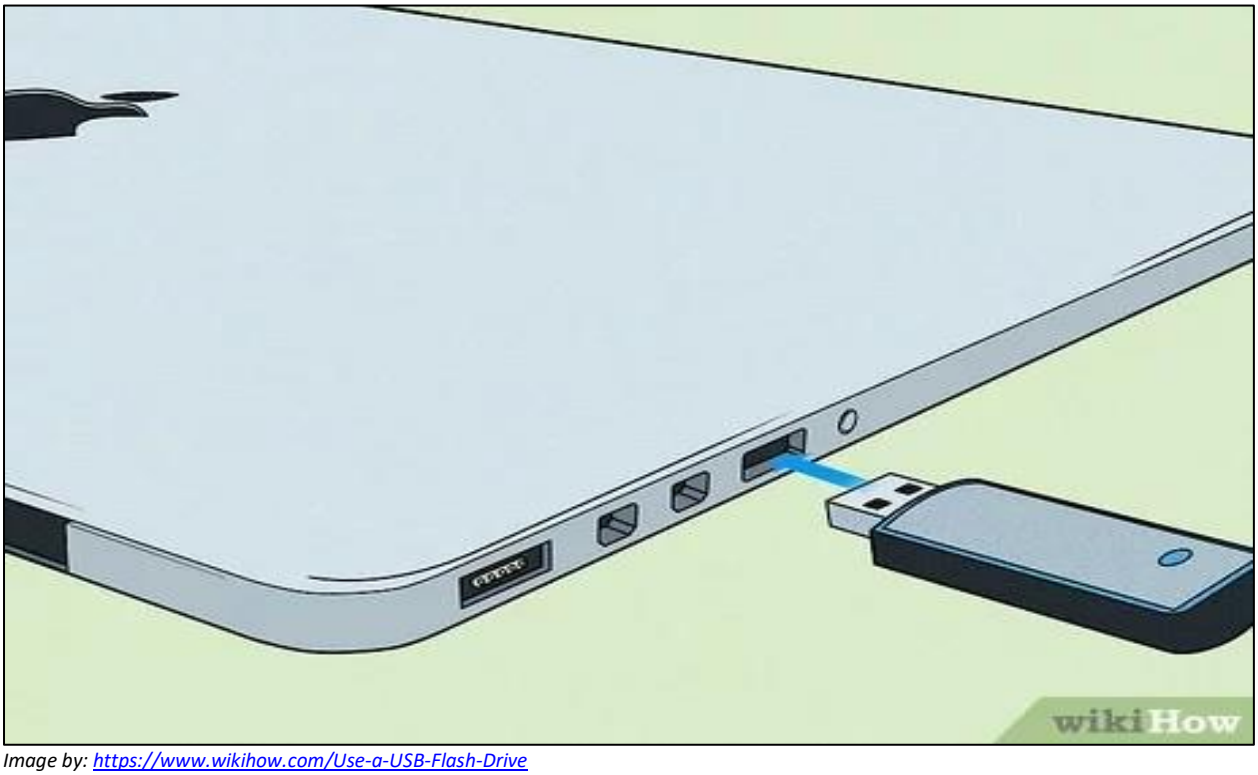
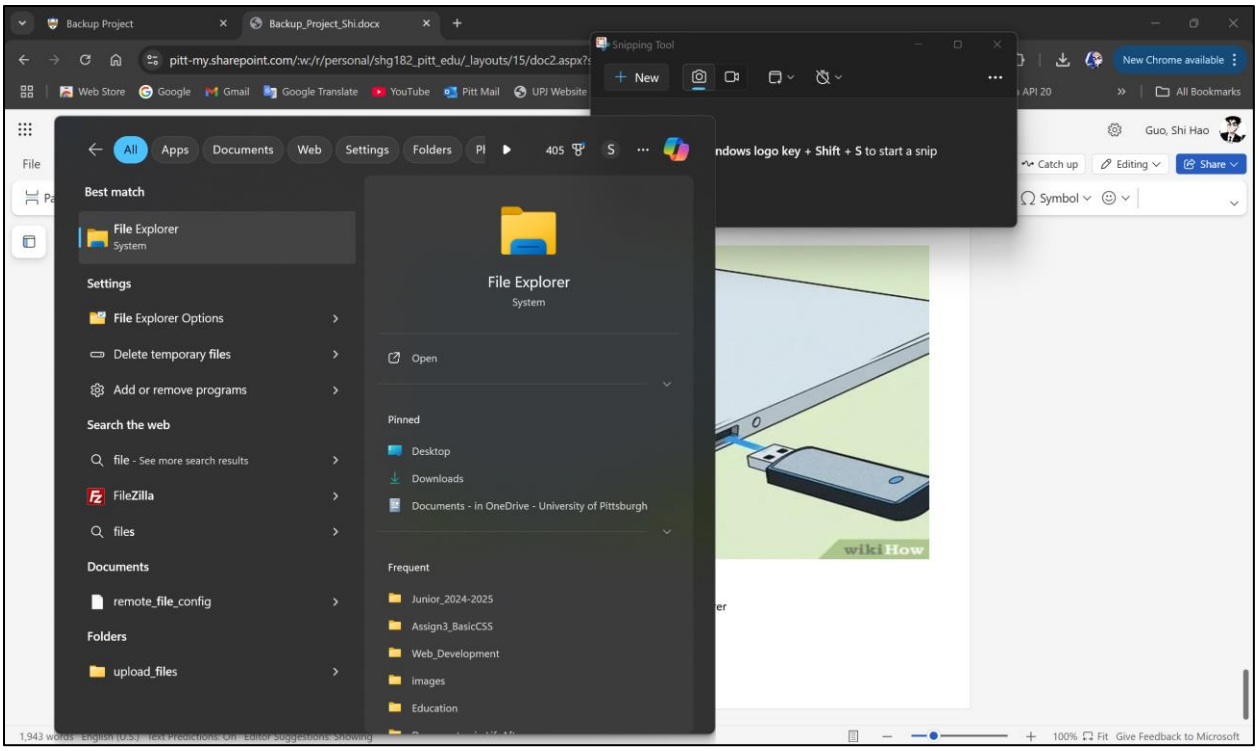
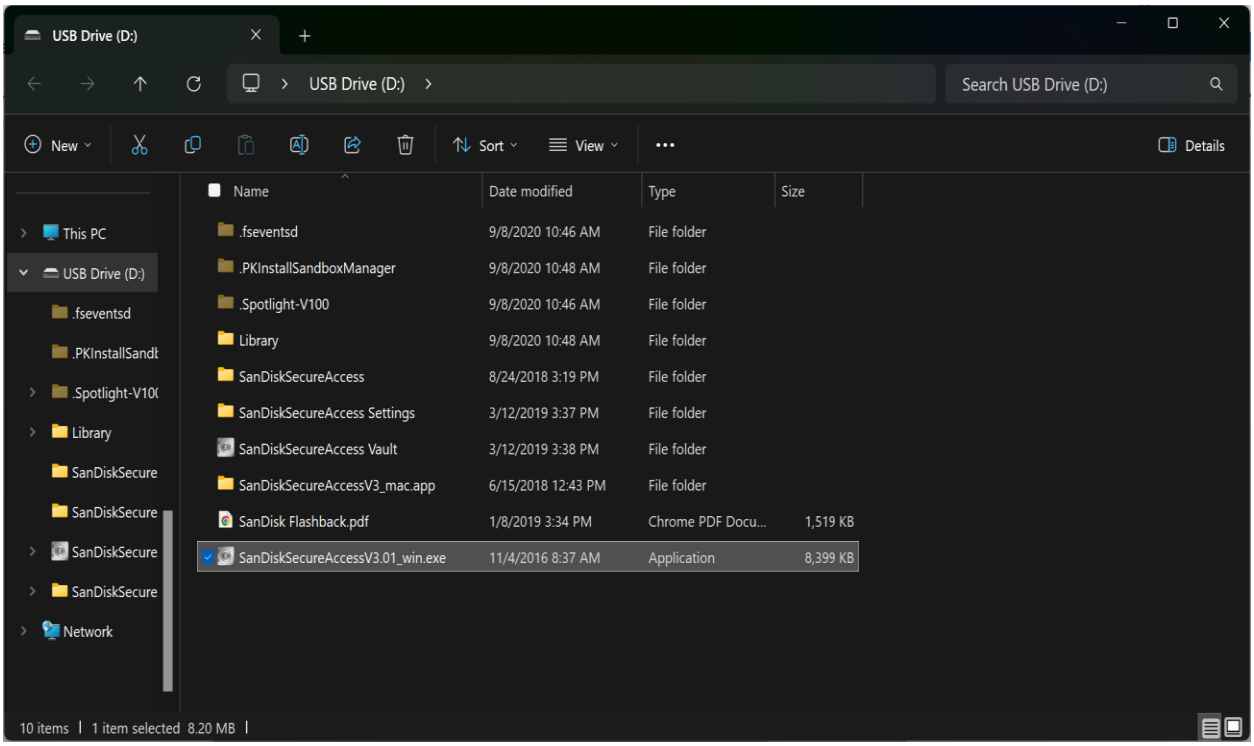


Image by: https://www.wikihow.com/Use-a-USB-Flash-Drive

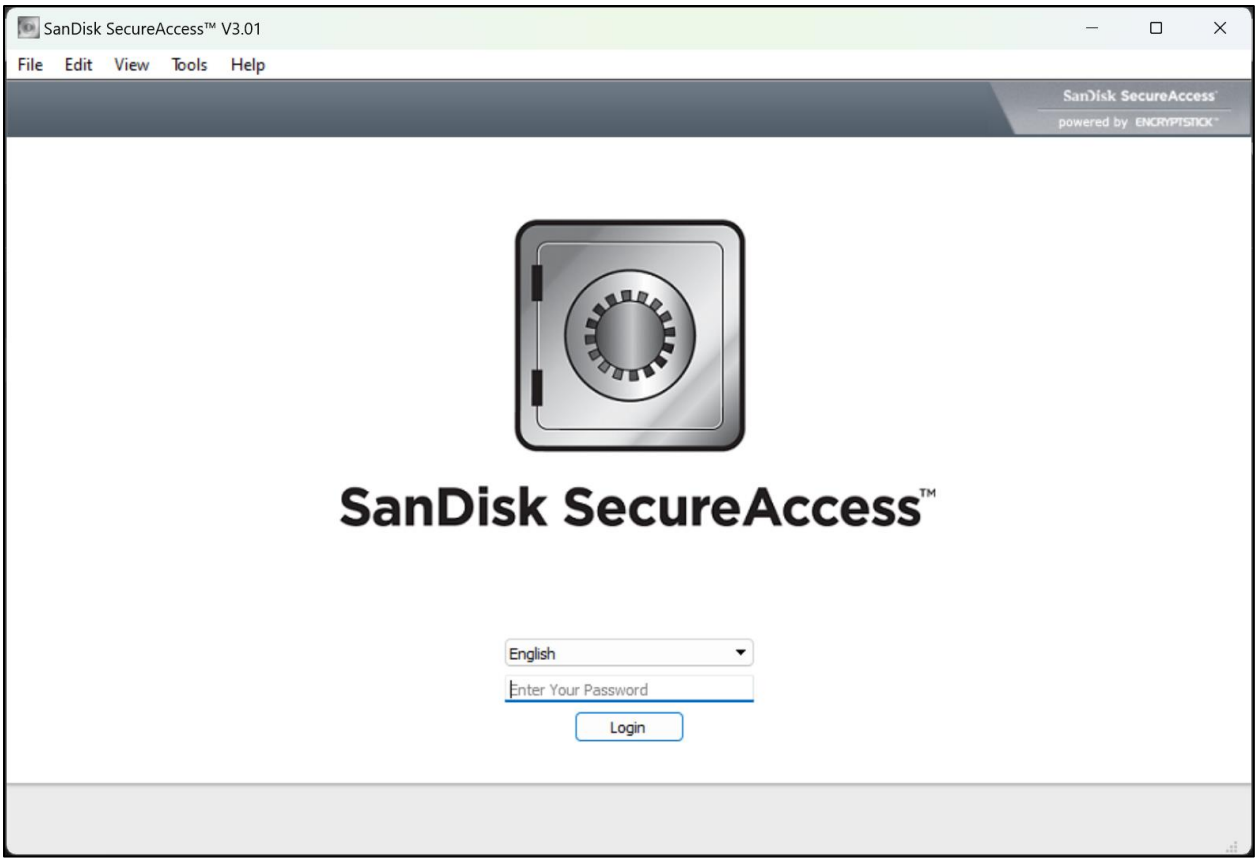
Step 3: Locate and open File Explorer



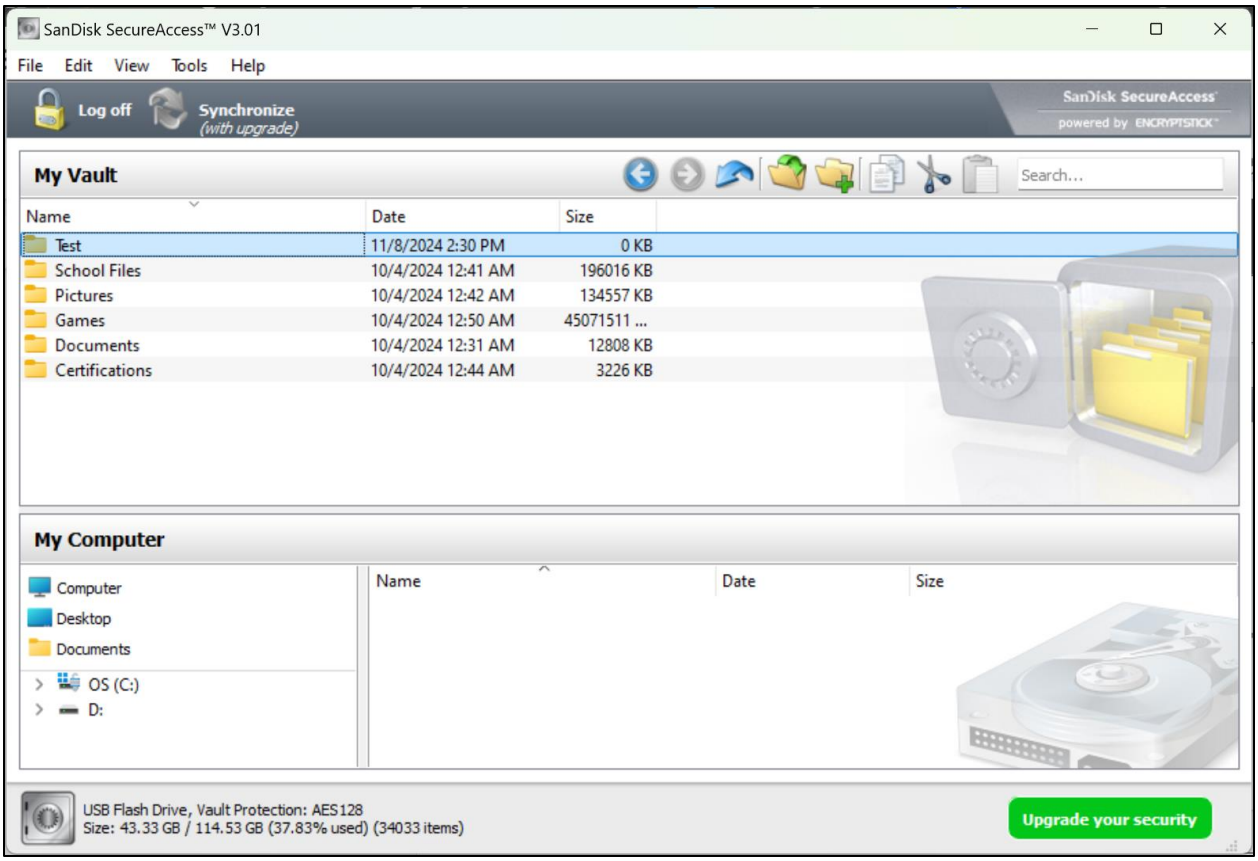
Step 4: Locate the newly plugged in flash drive folder



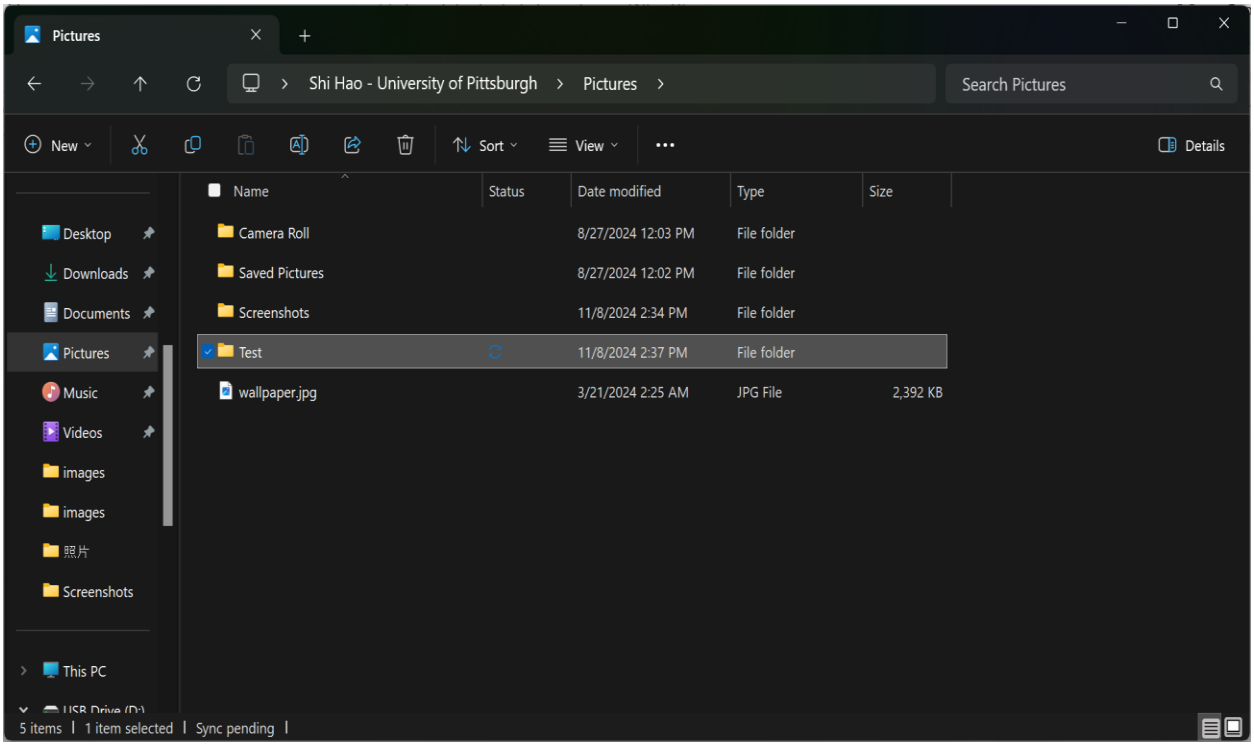
Step 5: Start up the application that comes with flash drive and logged in with my credentials



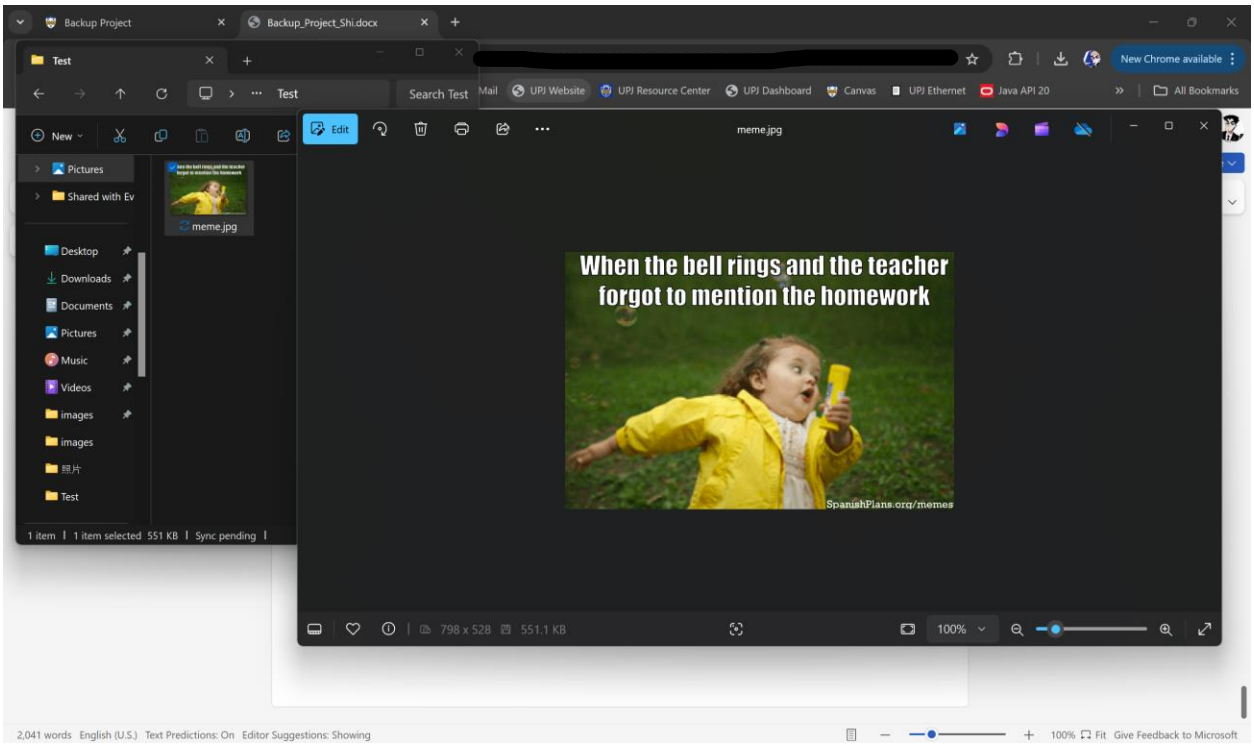
Step 7: Create a new folder by right click on an empty space > select new > named the new folder to “Test” (Note the Test folder only has 0KB right now because it is empty)



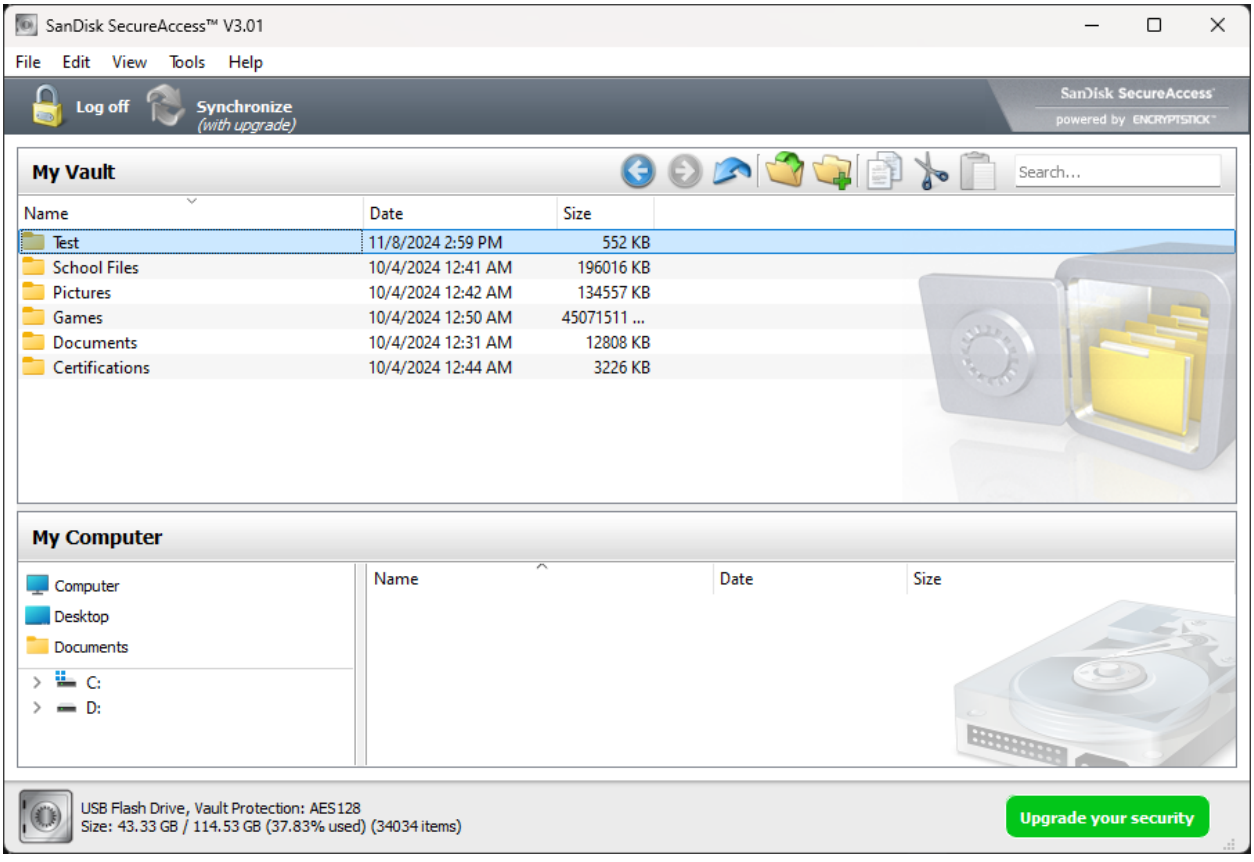
Step 8: Go back to File Explorer > Pictures > create a new folder by right click on an empty space > select new > renamed the new folder to “Test”



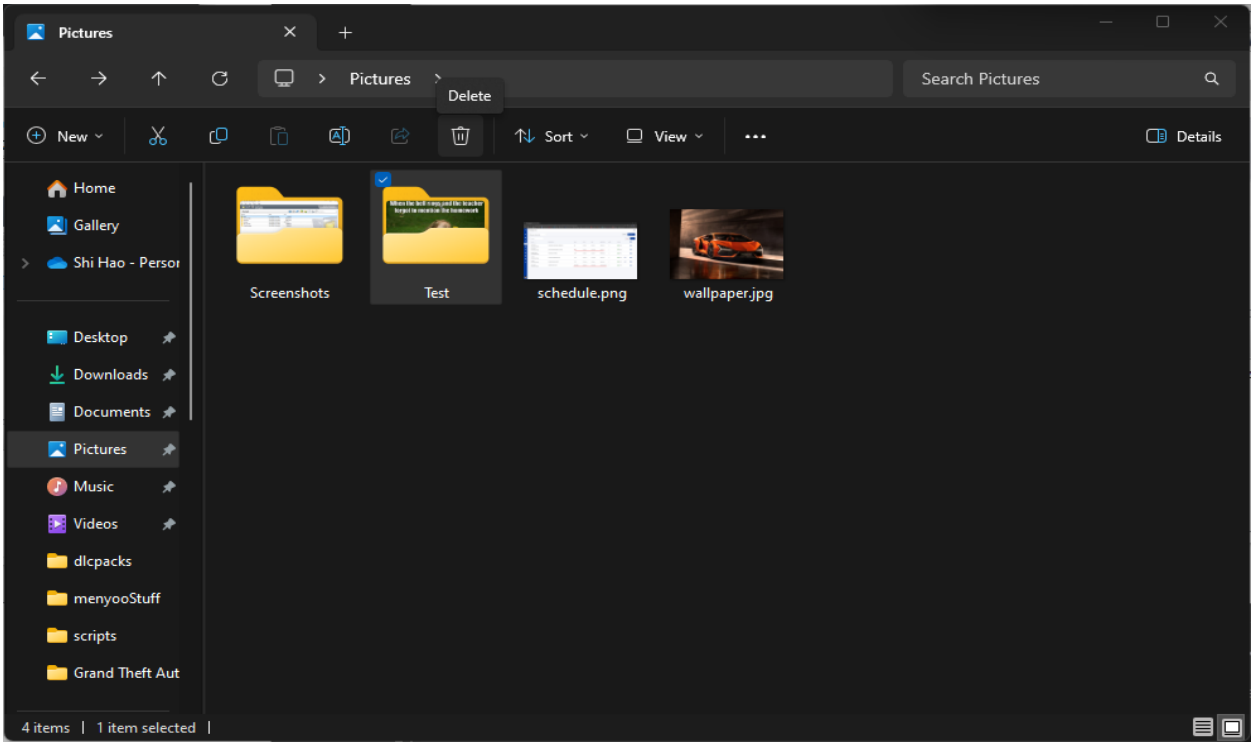
Step 9: Save/download a picture into the Test folder



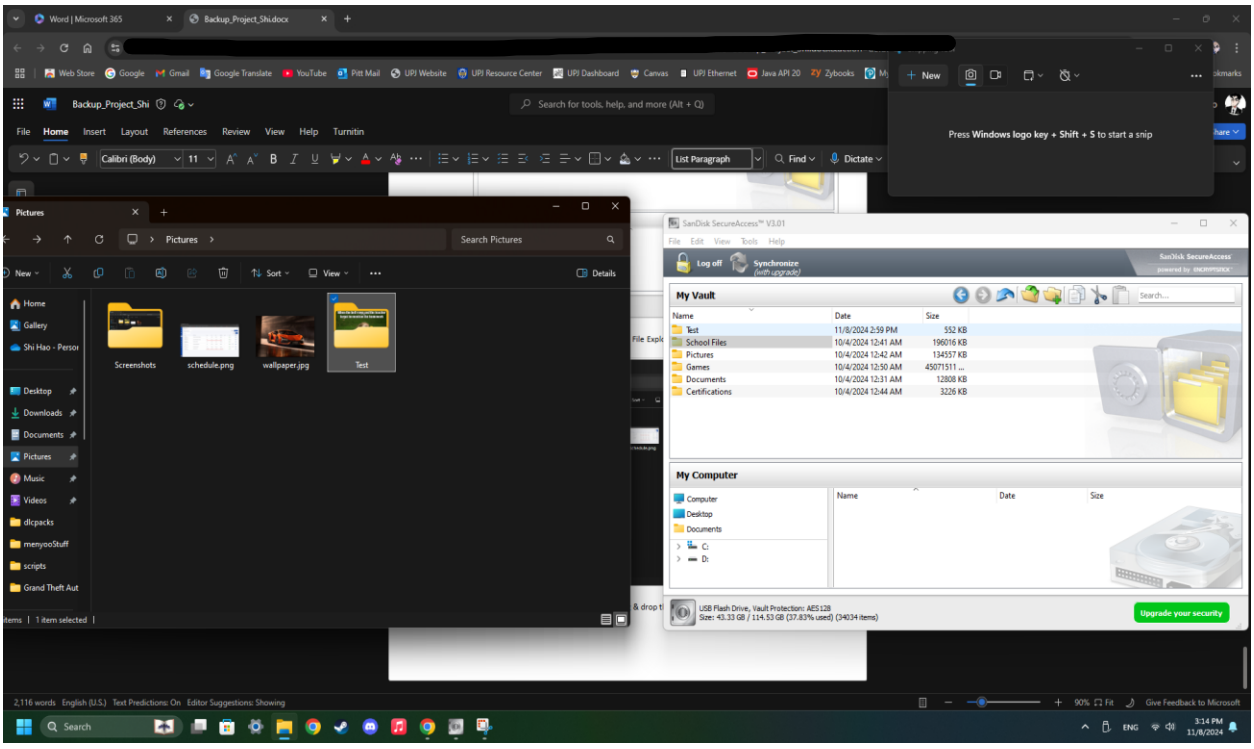
Step 10: Drag & drop the entire “Test” folder, not the image itself (Although you could), to an empty space in the flash drive directory (Note the Test folder now has 552KB)



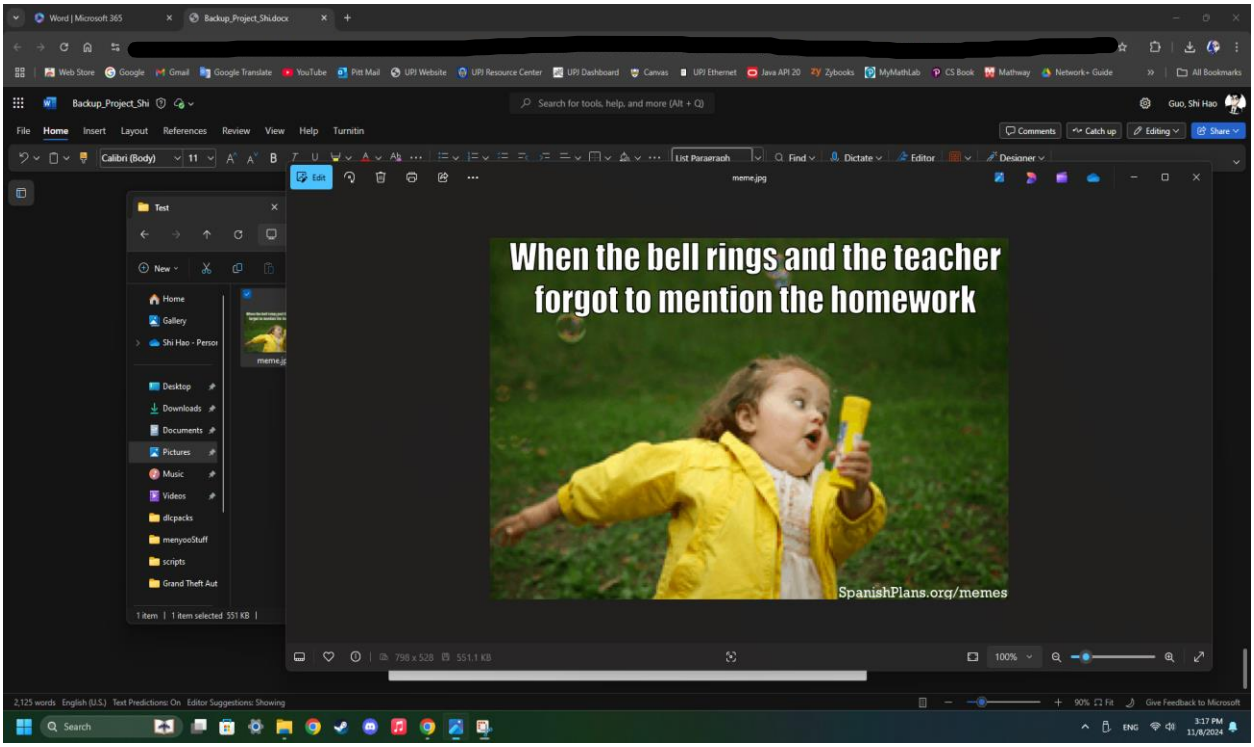
Step 11: Delete the Test folder that is in the File Explorer > Pictures, make sure is fully deleted, even the recycle bin



Step 12: Go back to the flash drive, then drag & drop the Test folder into File Explorer > Pictures



Step 13: There you go, the picture is back.



5. **<u>Microsoft Active Directory Backup:</u>**
    a. By using Windows Server Backup
        i. Log in to the server with administrative privileges
        ii. Open Server Manager > select Tools > and then Windows Server Backup
        iii. Select Local Backup > Backup Once > Different options and then Next
        iv. Select Custom and then Next > Add Items and then System State > Select Ok
        v. Select Local drives/Remote shared folder > Select the backup location > Backup
    b. Back up at least one domain controller
    c. Back up domain controllers that hold the FSMO (Flexible Single Master Operation) roles
    d. Back up frequently
    e. Ensure the backup is no older than the Active Directory tombstone lifetime (TSL)
    f. Video for more detail: https://www.youtube.com/watch?v=n1JFRvop5sw&t=171s