

S3 Backup and Restore

Arch and Design

This application recursively traverses the files of a given absolute path to a local directory and backs up the said directory inside a specific bucket. This application can also restore from the cloud. In order to have created this Python app, AWS's Python SDK called "Boto3" allows this application to backup, update, and restore locally with a bucket.

For backup.py, the user must input a bucket name, a bucket directory, and the absolute path to the local directory that the user wishes to backup. backup.py will add the valid local directory to the specified bucket inside of S3, and if there is no bucket present, the application will create one. Once the bucket is created, its directory name is searched for; if not present, it is also created. Once found or created, the local directory's absolute path is recursively searched using `os.walk()`. As the application walks through the directories, the files inside are uploaded to the bucket. If the file already exists, the local version's date modified is compared to the cloud's version. The file is updated if the local's modified date is greater/after the cloud's version. Once all directories are searched, the console will display how many files were created or updated.

Restore.py is more straightforward; it takes in a bucket name, a bucket directory, and a local directory's absolute path where the files in the cloud will be restored/downloaded locally. First, the bucket's files are searched in the bucket's directory as the filter. Each directory and file's path is appended to the local path creating a new path. If this new path doesn't exist locally, then a new directory is created. The files are then restored/downloaded to the local directory. Once all files from the bucket have been restored, the console displays how many files were restored locally.

Pre-requisites

In order to use backup.py and restore.py, you must make sure to have Python installed and an AWS account. In addition, the AWS CLI needs to be installed. Once installed and added as a PATH variable, open Command Prompt and enter:

```
C:\Users\User > aws configure
```

Then a prompt will be displayed asking the following information regarding your AWS account:

```
PS C:\Users\William\source\PycharmProjects\Program3> aws configure
AWS Access Key ID [*****ODNO]: ACCESS_KEY_ID
AWS Secret Access Key [*****qA42]: SECRET_ACCESS_KEY
Default region name [us-west-2]: REGION
Default output format [json]: FORMAT
```

In addition, Boto3 must also be installed. Open Command Prompt and enter the following:

```
pip3 install boto3
```

backup.py Instructions

1. Open Command Prompt
2. Change directory to where backup.py is located using the following command:

```
C:\Users\User>cd <backup.py's absolute path>
```

3. Once at the correct path where backup.py is located, enter the following command:

Command parameters: <bucket-name>:<bucket-directory-name> <absolute-path-to-local-directory>

Note: <absolute-path-to-local-directory> comes after like restore.py in order to avoid absolute path formatting issues

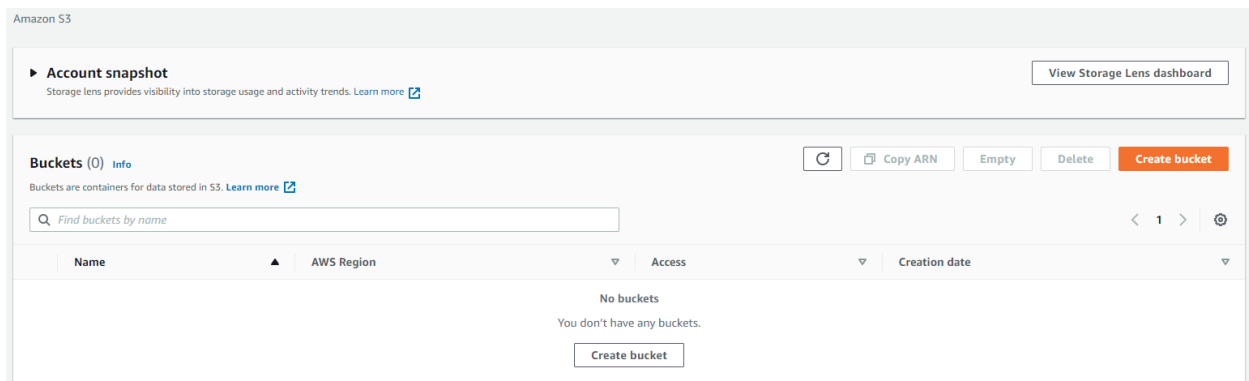
Example:

```
C:\Users\User\Desktop> python backup.py Program3::HelloWorld
"C:\Users\User\source\PycharmProjects\Program3\files"
```

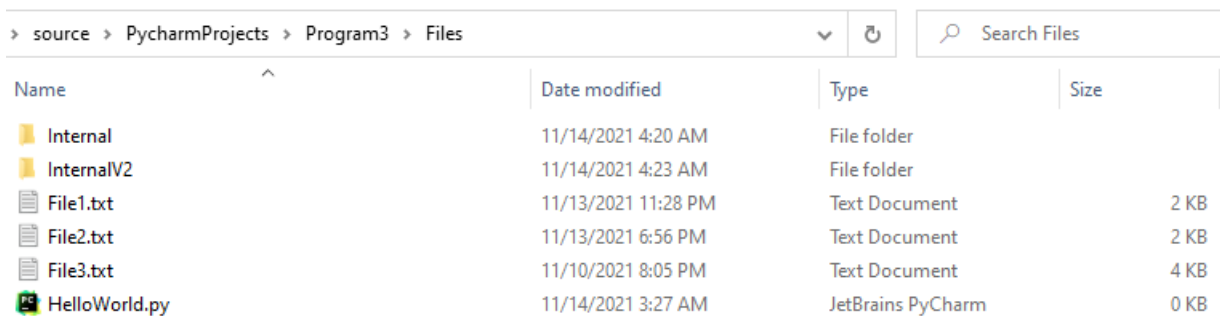
4. The script then runs resulting in the local directory being backup to your S3 bucket.

Screenshots:

1. No buckets available



2. The folder I will upload to my S3 bucket that I will create



3. Changing directory to where backup.py is located, which is my desktop in this case.



4. The script is completed and the files are inside the new S3 bucket called Program3

```
C:\Users\William\Desktop>python backup.py Program3::HelloWorld "C:\Users\William\source\PycharmProjects\Program3\files"
Backing up to new Bucket program3
Creating File: HelloWorld/files/File1.txt
Creating File: HelloWorld/files/File2.txt
Creating File: HelloWorld/files/File3.txt
Creating File: HelloWorld/files/HelloWorld.py
Creating File: HelloWorld/files/Internal/File4.txt
Creating File: HelloWorld/files/Internal/File5.txt
Creating File: HelloWorld/files/InternalV2/Deep/File7.txt
Files Backed up: 7
Files Updated: 0
```

5. As you can see, our files are showing up on the AWS website

Amazon S3 > program3 > HelloWorld/ > files/

files/ Copy S3 URI

Objects Properties

Objects (6)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

Refresh Copy S3 URI Copy URL Download Open Delete Actions Create folder Upload

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	File1.txt	txt	November 14, 2021, 04:32:36 (UTC-08:00)	1.4 KB	Standard
<input type="checkbox"/>	File2.txt	txt	November 14, 2021, 04:32:36 (UTC-08:00)	1.7 KB	Standard
<input type="checkbox"/>	File3.txt	txt	November 14, 2021, 04:32:36 (UTC-08:00)	3.1 KB	Standard
<input type="checkbox"/>	HelloWorld.py	py	November 14, 2021, 04:32:36 (UTC-08:00)	0 B	Standard
<input type="checkbox"/>	Internal/	Folder	-	-	-
<input type="checkbox"/>	InternalV2/	Folder	-	-	-

6. Now we're going to add new file called File-6.txt inside the directory called internalV2

> source > PycharmProjects > Program3 > Files > InternalV2 Refresh Search InternalV2

Name	Date modified	Type	Size
Deep	11/14/2021 4:20 AM	File folder	
File-6.txt	11/14/2021 4:21 AM	Text Document	2 KB

7. I'm also going to modify File4.txt inside Internal

> source > PycharmProjects > Program3 > Files > Internal Refresh Search Internal

Name	Date modified	Type	Size
File4.txt	11/14/2021 4:56 AM	Text Document	4 KB
File5.txt	11/10/2021 8:08 PM	Text Document	5 KB

8. Now re-running the script

```
Command Prompt
C:\Users\William\Desktop>py backup.py Program3::HelloWorld "C:\Users\William\source\PycharmProjects\Program3\files"
Backing up to existing Bucket program3
Updating File: HelloWorld/files/Internal/File4.txt
Creating File: HelloWorld/files/InternalV2/File-6.txt
Files Backed up: 1
Files Updated: 1
C:\Users\William\Desktop>
```

9. File-6.txt now appears in my S3 bucket

Amazon S3 > program3 > HelloWorld/ > files/ > InternalV2/

InternalV2/ Copy S3 URI

Objects Properties

Objects (2)
Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

Refresh Copy S3 URI Copy URL Download Open Delete Actions Create folder Upload

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	Deep/	Folder	-	-	-
<input type="checkbox"/>	File-6.txt	txt	November 14, 2021, 04:57:58 (UTC-08:00)	1.3 KB	Standard

10. File4.txt's has now been updated, take note of the "Last Modified" column

Amazon S3 > program3 > HelloWorld/ > files/ > Internal/

Internal/ Copy S3 URI

Objects Properties

Objects (2)
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Refresh Copy S3 URI Copy URL Download Open Delete Actions Create folder Upload

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	File4.txt	txt	November 14, 2021, 04:57:58 (UTC-08:00)	3.4 KB	Standard
<input type="checkbox"/>	File5.txt	txt	November 14, 2021, 04:32:36 (UTC-08:00)	4.5 KB	Standard

restore.py Instructions

1. Open Command Prompt
2. Change directory to where restore.py is located using the following command:

```
C:\Users\User>cd <restore.py's absolute path>
```

3. Once at the correct path where backup.py is located, enter the following command:

Command parameters: <bucket-name>::<bucket-directory-name> <local-directory-name-to-restore-to>

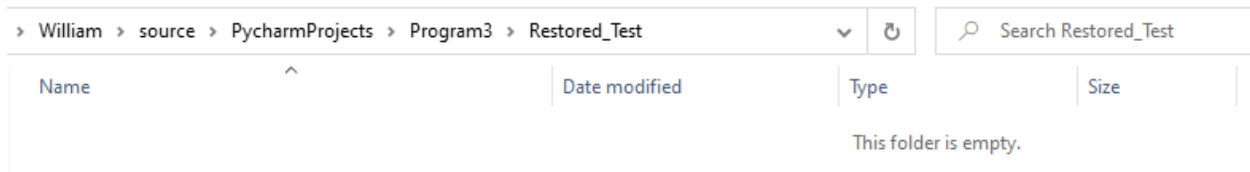
Example:

```
python restore.py program3::HelloWorld  
"C:\Users\William\source\PycharmProjects\Program3\Restored Test\New Restored"
```

4. The script then run resulting in the local directory being backup to your S3 bucket.

Screenshots:

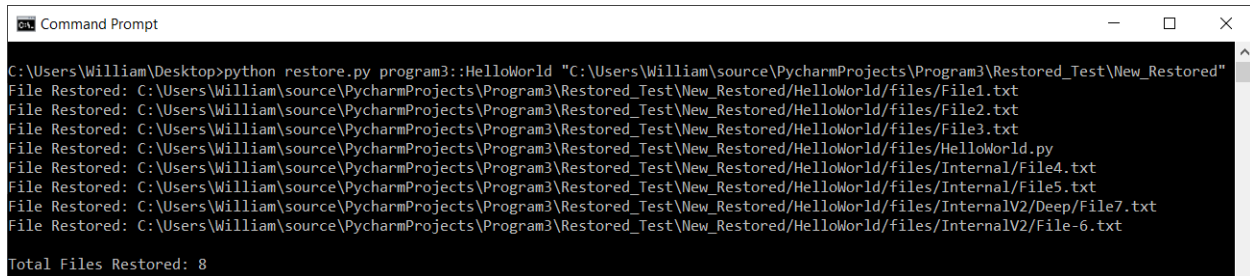
1. The folder I will restore my bucket files to



2. Changing directory to where restore.py is located, which is my desktop in this case.



3. The script is completed and the files are restored to our Restored_Test folder



4. As you can see, our files now appear their respective folders inside the New_Restored folder

