

Program 3 Design Documentation

Backup - backup.py:

Takes two inputs:

directory: The local directory path to be backed up.

bucket_path: The destination bucket path in the format "bucket-name::directory-name" where the files will be backed up.

Outputs

The backup function provides informative output messages to the console, indicating the progress and status of the backup operation. It notifies users of the files being backed up, updated, or failed to back up.

Key Components

1. Directory Existence Check

The function checks if the specified local directory exists before proceeding with the backup operation. If the directory does not exist, an error message is displayed, and the function terminates.

2. AWS S3 Access

The function establishes a connection to AWS S3 using the boto3 library, allowing it to interact with S3 buckets and objects. It retrieves the AWS region from the session to ensure compatibility with the specified bucket.

3. Bucket Existence Check

Before initiating the backup process, the function checks if the destination bucket exists. If the bucket exists, the function proceeds with the backup operation. Otherwise, it attempts to create the bucket using the provided bucket name and region.

4. Backup Process

The function traverses the local directory using `os.walk()` to iterate through all subdirectories and files. For each file encountered, it constructs the corresponding destination path within the S3 bucket.

5. File Upload

For each file in the local directory, the function checks if the file already exists in the S3 bucket. If the file does not exist or has been modified locally since the last backup, the function uploads the file to the specified bucket path.

6. Output Messages

Throughout the backup process, the function prints informative messages to the console to provide feedback to the user. These messages include details about the files being backed up, updated, or failed to back up.

Restore - restore.py:

Takes two inputs:

directory: The local directory path where the files will be restored.

bucket_path: The source bucket path in the format "bucket-name::directory-name" from which the files will be restored.

Outputs:

The restore function provides informative output messages to the console, indicating the progress and status of the restore operation. It notifies users of the files being restored and indicates when the restore process is completed.

Key Components

1. Input Validation

The function checks if the correct number of command-line arguments is provided and verifies that the operation is set to "restore." If the syntax is incorrect, the function displays an error message and terminates.

2. Directory Existence Check

The function verifies if the specified local directory exists before proceeding with the restore operation. If the directory does not exist, an error message is displayed, and the function terminates.

3. AWS S3 Access

The function establishes a connection to AWS S3 using the boto3 library, allowing it to interact with S3 buckets and objects. It retrieves the AWS region from the session to ensure compatibility with the specified bucket.

4. Bucket Existence Check

Before initiating the restore process, the function checks if the source bucket exists. If the bucket exists, the function proceeds with the restore operation. Otherwise, it displays an error message and terminates.

5. File Restoration

The function iterates through all objects in the specified bucket directory and retrieves each file. It constructs the corresponding local file path based on the directory structure within the bucket and downloads the file to the specified local directory.

6. Directory Creation

Before downloading each file, the function checks if the destination directory exists. If the directory does not exist, it creates the necessary directory structure to ensure that the files can be restored with their original directory structure intact.

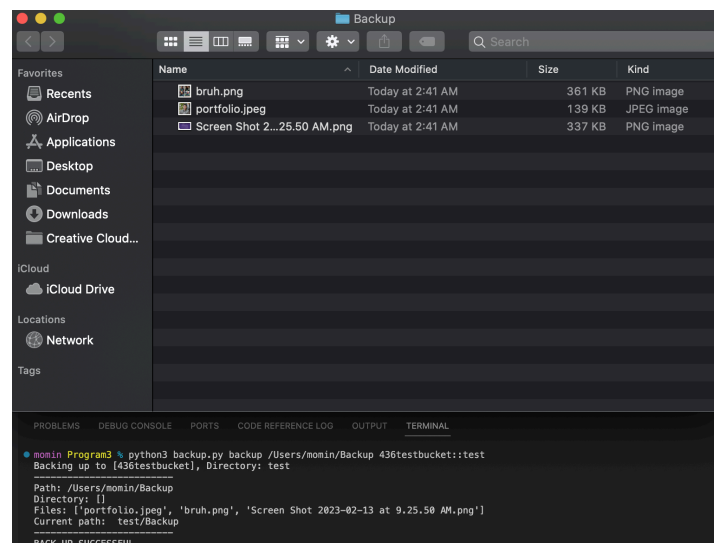
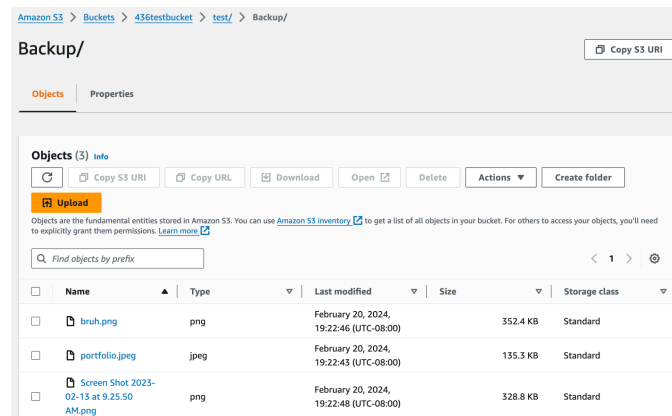
7. Output Messages

Throughout the restore process, the function prints informative messages to the console to provide feedback to the user. These messages include details about the files being restored and indicate when the restore process is completed.

8.) Multiple Function Use

Unlike, backup.py, several functions were used to build this program as connection errors and finding directories took lots of debugging.

Backup Running:



Restore Running:

