**WEEK 04: HOMEWORK 02 –**

**AWS CLI AND DYNAMODB**

Hommy Rosado

Department of Computer Science, UMGC

SDEV 400 – Secure Programming in the Cloud

Mr. Craig Poma

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**Section One: Utilize the AWS CLI to Create and Update a DynamoDB Table**

1. # Create the Sensor Table as a multiple line command

2. aws dynamodb create-table --table-name Sensors --attribute-definitions AttributeName=Sensor,AttributeType=S --key-schema AttributeName=Sensor,KeyType=HASH --provisioned-throughput ReadCapacityUnits=10,WriteCapacityUnits=5

Source: <https://learn.umgc.edu/d2l/le/766913/discussions/threads/28446075/View>

Demonstration of the - Using your AWS Educate Cloud9 AWS CLI environment create a Table named Sensors with a Hash Key named Sensor.

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Command: aws dynamodb list-tables

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Demonstration of use the AWS-CLI to load at least 20 different sensor items. The sensor items should be stored in a JSON file. When creating the JSON file, be sure to not include all attributes for each item.

Command:

aws dynamodb batch-write-item --request-items file://homework02.json --return-consumed-capacity INDEXES --return-item-collection-metrics SIZE

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Command: Print out all items in the table utilizing the Scan().  
aws dynamodb scan --table-name Sensors

**Section Two: Utilize Python to Create a DynamoDB table and implement additional functionality**

1. Homework Task 1: Create two (2) S3 buckets with DNS-compliant names of your choice. In each of the buckets creates 2 folders. The following Figures 1 - 3 demonstrates the use of the AWS Management Console listing two DNS-compliantly named S3buckets:

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Figure : The above graphic demonstrates the creation of 2 S3 Buckets with DNS-compliant names ending in alpha and beta.

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Figure : The above graphic demonstrates the successful creation of two folders (Jobs & Support) having been created in the S3 Bucket ending in alpha.

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Figure : The above graphic demonstrates the successful creation of two folders (Jobs & Support) having been created in the S3 Bucket ending in beta.

2. Homework Task 1: Copy 2 files (or your choice) to each of the 2 folders you created for your S3 bucket. The following Figures 4 - 3 demonstrate the AWS Management Console listing the specified number of files to each of the S3 bucket folders created in step 1.

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Figure : The above graphic demonstrates the successful addition of two items in the S3 Bucket ending in alpha folder Jobs.

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Figure : The above graphic demonstrates the successful addition of two items in the S3 Bucket ending in alpha folder Support.

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Figure : The above graphic demonstrates the successful addition of two items in the S3 Bucket ending in beta folder Jobs.

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Figure : The above graphic demonstrates the successful addition of two items in the S3 Bucket ending in beta folder Support.

**Section Two: AWS S3 Application Menu**

In efforts to produce ease of navigation, the application implements two menus: the first menu (main\_menu function) provides the user with options relating to the S3 Buckets (List, Create, and Delete), the second menu (sub\_menu function) provides the user with actions to be implemented on S3 Buckets (Add to, Delete from, Copy to, Download, and an option to return to the main\_menu function).

Each of the Menu options invoke individual functions.

The main menu allows the user to select from the following options:

1. List all present S3 Buckets (See Figure x)
2. Create an S3 Bucket
3. Delete an existing S3 Bucket
4. Perform secondary actions listed in a sub-menu (See Figure x):
   1. Add items to a specified S3 Bucket
   2. Delete items from a specified S3 Bucket
   3. Copy items from a specified to another specified S3 Bucket
   4. Download items from a specified S3 Bucket
   5. Return to the Main Menu
   6. Exit the application
5. Exit the application

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Figure : Main console menu.

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Figure : Sub console menu.

The following reviews each of the individual functions:

1. list\_buckets:  
   This function performs an iteration through the current S3 Buckets and produces an updated list of S3 Buckets.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| list\_buckets() | This function lists all S3 Buckets. Region set was not specified in instructions. | Test One:  From the main menu, option 1 was selected generating the output of all Buckets  Test two:  A new bucket was created [kentuckybucket].  (See Figure 10, 11) | Success |

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Figure : list\_buckets function results.

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Figure : list\_buckets function updated results reflecting new bucket.

1. create\_bucket:  
   This function implements a while statement to evaluate various user inputs to create a new S3 Bucket. Validation is performed on first\_name, and last\_name input values, to include Yes / No validation on initial user prompt for continued desire to create an S3 Bucket.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| create\_bucket() | This function creates a new S3 Buckets and concatenates “umgc” information and a six digit string of random numbers. | Test One:  As per guidance, [jimrobertson-321921] was used as an example.  (See Figure 12) | Success |

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Figure : create\_bucket function results demonstrating the addition of a new bucket meeting the homework requirement concatenated with the class code information.

1. add\_items\_buckets:  
   This function allows the user to select from the existing list of S3 Buckets, then identifying objects to add to the S3 Bucket.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| add\_items\_buckets() | This function adds a new item to a specified S3 Bucket. | Test One:  A variable was set to the file name [testfile\_01.txt] and application prompts the user for a location of which bucket the file should be added.  The figures demonstrate a success message in the console, and a before and after of the Management Console showing the new file.  (See Figure 13-15) | Success |

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Figure : add\_items\_buckets function figure prior to the addition of the testfile\_01.txt file.

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Figure : add\_items\_buckets function console demonstrating the successful upload of the testfile\_01.txt file.

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Figure : add\_items\_buckets function AWS Management Console demonstrating the successful addition of the testfile\_01.txt file.

1. delete\_items\_buckets:  
   This function allows the user to select from the existing list of S3 Buckets, then identify objects to delete from the S3 Bucket. The user will be prompted with a secondary fail-safe message.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| delete\_items\_buckets() | This function deletes an item from a specified S3 Bucket. | Test One:  The application provides the user a list of buckets and their contents, then prompts the user for the full path of the item (object) desired to be deleted. The figures demonstrate a success message in the console, and a before and after of the Management Console confirming the deleted file.  (See Figure 16-18) | Success |

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Figure : delete\_items\_bucket function console demonstrating the deletion of the testfile\_01.txt file.

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Figure : delete\_items\_bucket function console demonstrating the successful deletion of the testfile\_01.txt file.

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Figure : delete\_items\_bucket function AWS Management Console demonstrating the successful deletion of the testfile\_01.txt file.

1. delete\_bucket:  
   This function allows the user to select from the existing list of S3 Buckets, then identifying the S3 Bucket they seek to delete. The user will be prompted with a secondary fail-safe message.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| delete \_buckets() | This function deletes a specified S3 Bucket. | Test one:  Deletion of first bucket.  Test two:  Deletion of second bucket.  The application provides the user of a list of buckets, then prompts the user for the name of the desired bucket to be deleted. The figures demonstrate a success message in the console, and a before and after of the Management Console confirming the deleted file.  (See Figure 19-22) | Success |

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Figure : delete\_buckets function AWS Management Console demonstrating the targeted Buckets for deletion.

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Figure : delete\_buckets function with successful deletion of bucket test one.

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Figure : delete\_buckets function with uncalculated output, but successful deletion of bucket test two.

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Figure : delete\_buckets function demonstrating via the AWS Management Console the deletion of test one and test two buckets.

1. copy\_items\_buckets:  
   This function allows the user to select from the existing list of S3 Buckets identifying the ‘copy from / origin’ to ‘copy to / destination’ S3 Buckets they seek to work with.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| copy\_items \_buckets() | This function copies an item from a specified S3 Bucket to another. | Test one:  User prompted with option to select from which origin / source bucket.  All items from within the bucket are listed. The user is then prompted to select the item to copy, then provided a list of buckets to select a destination.  Source: [edu.umuc.sdev400.hommyrosado.photos]  Item:  [2017/TESTIMAGE.svg.png]  Destination:  [edu.umuc.sdev400.testbucketmaster-676959]  (See Figure 23-25) | Success |

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Figure : copy\_items \_buckets function above figure demonstrating via the AWS Management Console an empty destination bucket.

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Figure : copy\_items \_buckets function above figure demonstrating via the console the successful steps taken to identify a source bucket, source file, and copy the file to the target destination bucket.

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Figure : copy\_items \_buckets function above figure demonstrating via the AWS Management Console the successful copy of the target file to the destination bucket.

1. download\_items\_buckets:  
   This function allows the user to select from the existing list of S3 Buckets, then identify objects to download from the selected S3 Bucket.

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Details | Test | Result |
| download\_items\_buckets() | This function downloads an item from a specified S3 Bucket. | Test one:  Because I haven’t figured how to show the Buckets and items  following the buckets, I listed all buckets and objects. Test case bucket: [edu.umuc.sdev400.hommyrosado .photos]  Test case file:  2019/2019\_upload\_doc.txt  (See Figure 26) | Success |

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Figure : download\_items\_buckets function above figure demonstrating via the console the successful download of a file – and read output of the file.

1. exit\_application:  
   This option is afforded to the user in the Main\_menu and the Sub\_menu, allowing the user an option to exit the application. Exit application function provides the user with timestamp information (See Figure 27).

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Figure : exit\_application function above figure demonstrates the successful output of timestamp information.

In conclusion, the application achieved a Pylint score of 9.52/10 (see Figure 28).

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Figure : This figure demonstrates a passing Pylint score of 9.52/10.