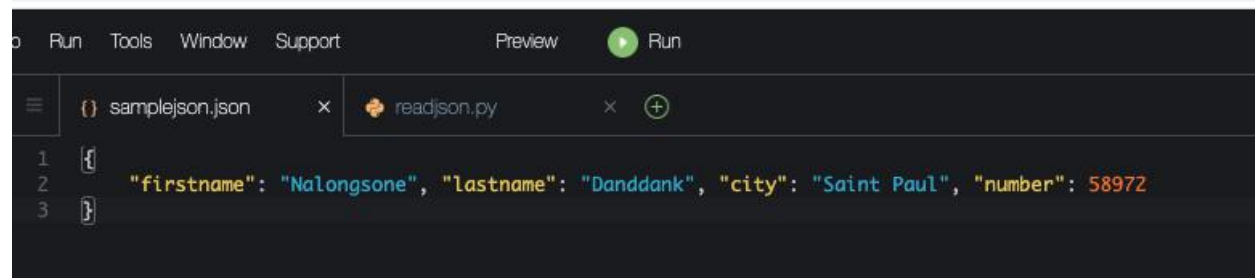


Lab #11 : NoSQL Databases: AWS DynamoDB and GCP Firestore

Exercise 1: Reading JSON Documents using Python

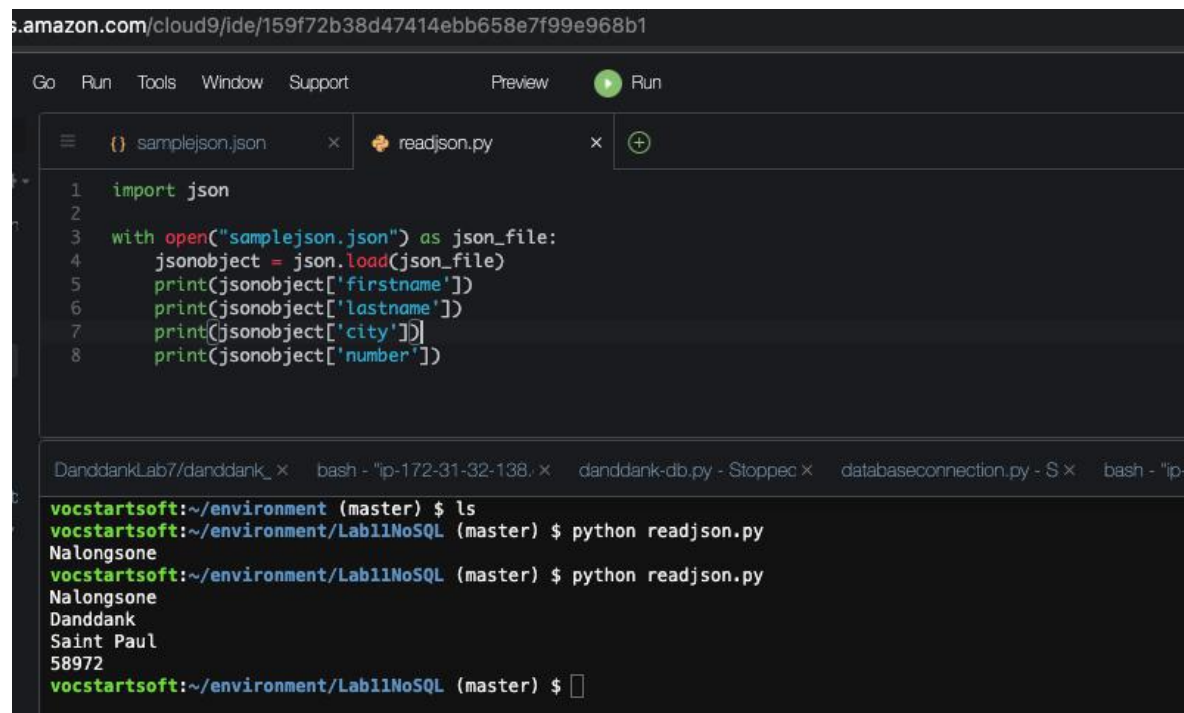
Lab report screen-shot #1:

amazon.com/cloud9/ide/159f72b38d47414ebb658e7f99e968b1



```
{
  "firstname": "Nalongsone", "lastname": "Danddank", "city": "Saint Paul", "number": 58972
}
```

Lab report screen-shot #2:



```
import json
with open("samplejson.json") as json_file:
    jsonobject = json.load(json_file)
    print(jsonobject['firstname'])
    print(jsonobject['lastname'])
    print(jsonobject['city'])
    print(jsonobject['number'])
```

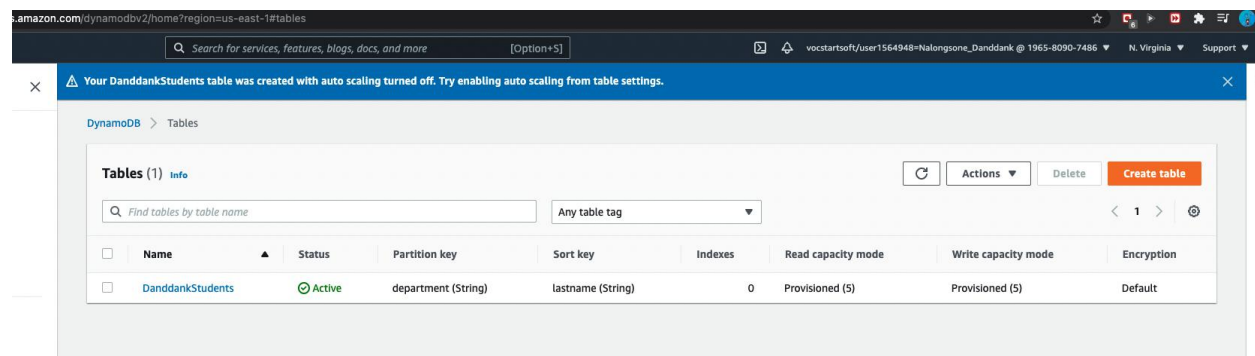
DanddankLab7/danddank_ x bash - "ip-172-31-32-138." x danddank-db.py - Stoppec x databaseconnection.py - S x bash - "ip-

```
vocstartsoft:~/environment (master) $ ls
vocstartsoft:~/environment/Lab11NoSQL (master) $ python readjson.py
Nalongsone
Danddank
Saint Paul
58972
vocstartsoft:~/environment/Lab11NoSQL (master) $
```

Exercise 2: Working with AWS DynamoDB

Part 1: Working with DynamoDB using AWS Console

Lab report screen-shot #3:



Search for services, features, blogs, docs, and more [Option+S] vocstartsoft/user1564948:Nalongsone_Danddank @ 1965-8090-7486 N. Virginia Support

Your DanddankStudents table was created with auto scaling turned off. Try enabling auto scaling from table settings.

DynamoDB > Tables

Tables (1) info

Find tables by table name Any table tag

<input type="checkbox"/>	Name	Status	Partition key	Sort key	Indexes	Read capacity mode	Write capacity mode	Encryption
<input type="checkbox"/>	DanddankStudents	Active	department (String)	lastname (String)	0	Provisioned (5)	Provisioned (5)	Default

Lab report screen-shot #4:

Create item

Form JSON

Attributes

Attribute name	Value	Type
department - Partition key	csc	String
lastname - Sort key	Danddank	String
firstname	Nalongsone	String
age	30	Number

Add new attribute

Cancel Create item

Lab report screen-shot #5:

The item has been saved successfully.

Items

Tables (1)

Tag: Any table tag

Find tables by name

DanddankStudents

DanddankStudents

Expand to query or scan items.

Items returned (4)

	department...	lastname	age	firstname
<input type="checkbox"/>	math	Smith	31	Jonh
<input type="checkbox"/>	math	Li	33	Yong
<input type="checkbox"/>	csc	Lee	31	Jane
<input type="checkbox"/>	csc	Danddank	30	Nalongsone

Lab report screen-shot #6:

Query

Table or index: DanddankStudents

department (Partition key): math

lastname (Sort key): Equal to

Filters:

Attribute name	Type	Condition	Value
Enter attribute name	String	Equal to	Enter attribute value

Add filter

Run Reset

Completed Read capacity units consumed: 0.5

Items returned (2)

	department...	lastname	age	firstname
<input type="checkbox"/>	math	Li	33	Yong
<input type="checkbox"/>	math	Smith	31	Jonh

Part 2: Working with DynamoDB using Python SDK

Lab report screen-shot #7:

```
File Edit Find View Go Run Tools Window Support Preview Run
Go to Anything (⌘P)
Dandank Lab7 Er
  dandank-mr-wordcount
  DandankLab7
  Lab11NoSQL
    createtable.py
    readjson.py
    samplejson.json
  ssl
  dandank-db.py
  dandank-db1.py
  dandank_hello_world.t
  databaseconnection.py
  README.md
aws
DandankLab7/dandank_ x bash - "ip-172-31-32-138. x dandank-db.py - Stoppec x databaseconnection.py - S x bash - "ip-172-31-32-138. x Lab11NoSQL/readjson.py x bash - "ip-172-31-32-138. x
import boto3
dynamodb_client = boto3.resource("dynamodb", region_name="us-east-1")
dynamodb_client.create_table(
    TableName="pets",
    KeySchema=[
        {
            "AttributeName": "petname",
            "KeyType": "HASH"
        }
    ],
    AttributeDefinitions=[
        {
            "AttributeName": "petname",
            "AttributeType": "S"
        }
    ],
    ProvisionedThroughput={
        "ReadCapacityUnits": 1,
        "WriteCapacityUnits": 1
    }
)
```

```
vocstartsoft:~/environment/Lab11NoSQL (master) $ python createtable.py
vocstartsoft:~/environment/Lab11NoSQL (master) $
```

Lab report screen-shot #8:

aws Services Search for services, features, blogs, docs, and more [Option+S] vocstartsoft/user1564948-Halongone_Dandank @ 1965-8090-7486 N. Virginia Support

DynamoDB Dashboard Tables Items New PartQL editor Backups Exports to S3 Reserved capacity DAX Clusters Subnet groups Parameter groups Events Tell us what you think Return to the previous console experience

DynamoDB > Tables > pets

Tables (2) Tag Any table tag Find tables by name DanndankStudents pets

pets Overview Indexes Monitor Global tables Backups Exports and streams Additional settings

General information

Partition key petname (String)	Sort key -	Capacity mode Provisioned	Table status Active No active alarms
-----------------------------------	---------------	------------------------------	--

Additional info

Items summary
DynamoDB updates the following information approximately every six hours.

Item count 0	Table size 0 bytes	Average item size 0 bytes
-----------------	-----------------------	------------------------------

Table capacity metrics View all metrics

1h 3h 12h 1d 3d 1w			
Read usage (average units/second)	Read throttled requests (count)	Read throttled events (count)	
1	1	1	

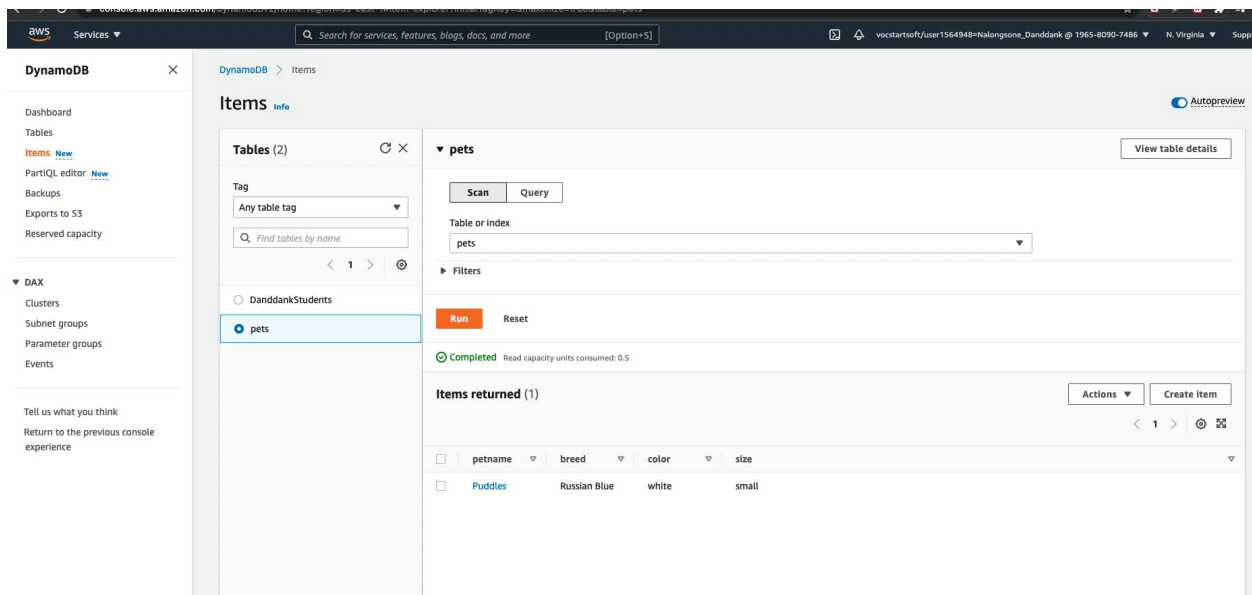
No data available

Lab report screen-shot #9:

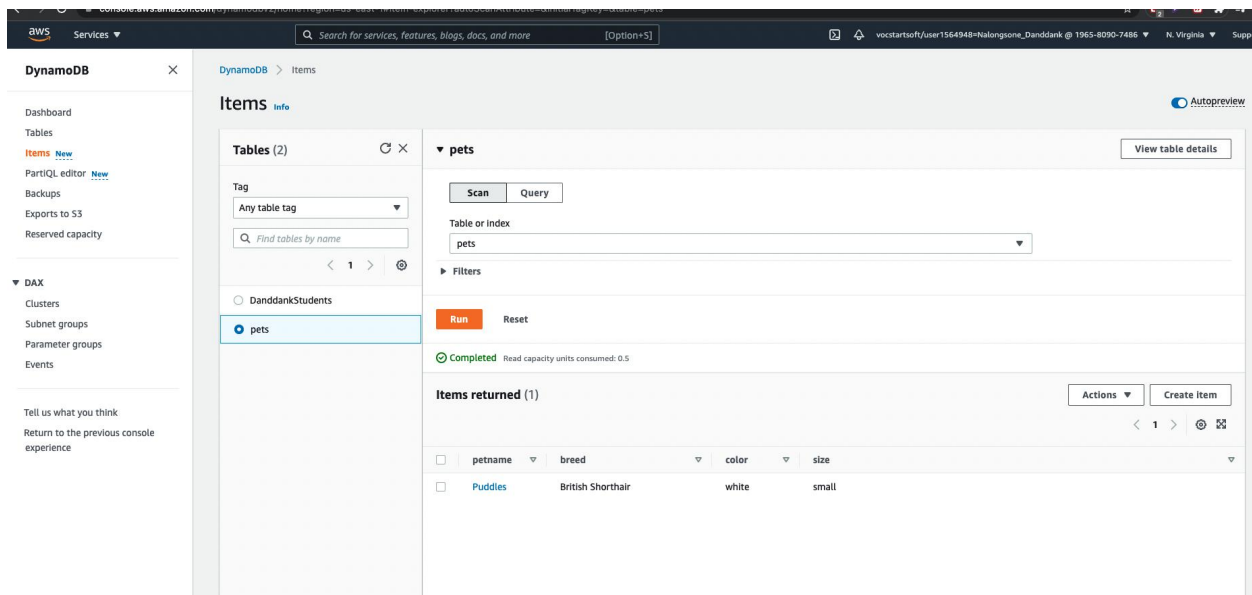
```
File Edit Find View Go Run Tools Window Support Preview Run
Go to Anything (⌘P)
Dandank Lab7 Er
  dandank-mr-wordcount
  DandankLab7
  Lab11NoSQL
    additems.py
    createtable.py
    readjson.py
    samplejson.json
  ssl
  dandank-db.py
  dandank-db1.py
  dandank_hello_world.t
  databaseconnection.py
  README.md
aws
DandankLab7/dandank_ x bash - "ip-172-31-32-138. x dandank-db.py - Stoppec x databaseconnection.py - S x bash - "ip-172-31-32-138. x Lab
import boto3
dynamodb_client = boto3.resource("dynamodb", region_name="us-east-1")
table = dynamodb_client.Table("pets")
table.put_item(
    Item={
        "breed": "Russian Blue",
        "petname": "Puddles",
        "color": "white",
        "size": "small"
    }
)
```

```
vocstartsoft:~/environment/Lab11NoSQL (master) $ clear
vocstartsoft:~/environment/Lab11NoSQL (master) $ python createtable.py
vocstartsoft:~/environment/Lab11NoSQL (master) $ python additems.py
vocstartsoft:~/environment/Lab11NoSQL (master) $
```

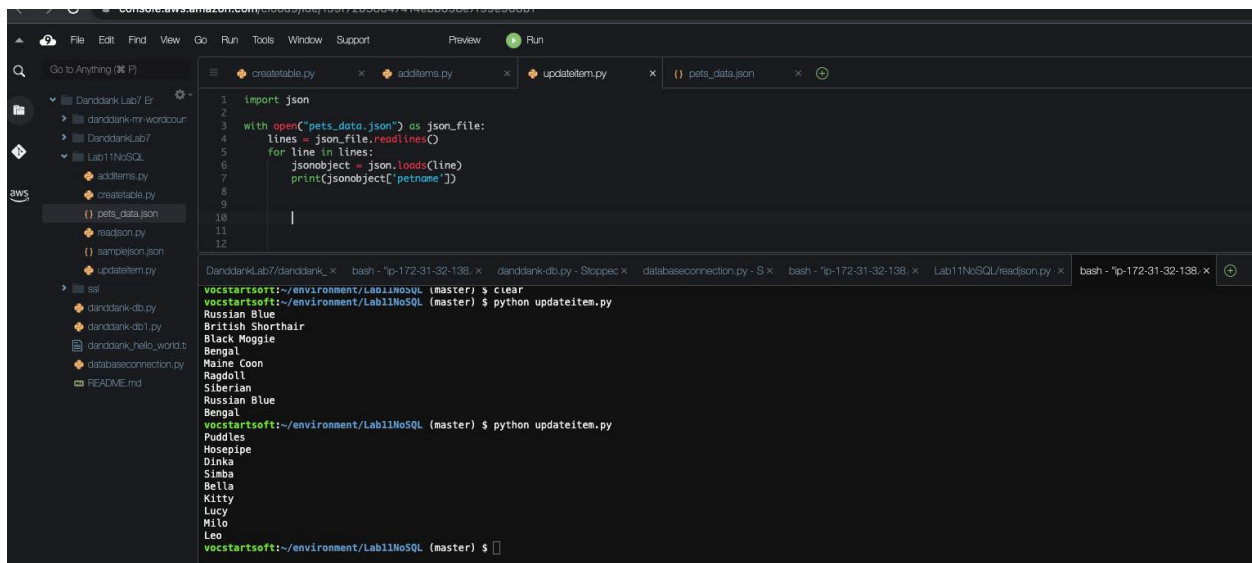
Lab report screen-shot #10:



Lab report screen-shot #11:



Lab report screen-shot #12:



Lab report screen-shot #13:

```
1 import json
2 import boto3
3
4 dynamodb_client = boto3.resource("dynamodb", region_name="us-east-1")
5
6 table = dynamodb_client.Table("pets")
7
8
9 with open("pets_data.json") as json_file:
10     lines = json_file.readlines()
11     for line in lines:
12         jsonobject = json.loads(line)
13         table.put_item(
14             Item=jsonobject
15         )
```

DandankLab7/dandank_ x bash - "p-172-31-32-138. x dandank-db.py - Stoppec x databaseconnection.py - S x bash - "p-172-31-32-138. x Lab11NoSQL/readjson.py x bash - "p-172-31-32-138. x

Bengal
Maine Coon
Ragdoll
Siberian
Russian Blue
Bengal
vocsstartsoft:~/environment/Lab11NoSQL (master) \$ python updateitem.py
Puddles
Hosepipe
Dinka
Simba
Bella
Kitty
Lucy
Milo
Leo
vocsstartsoft:~/environment/Lab11NoSQL (master) \$ python updateitem.py
vocsstartsoft:~/environment/Lab11NoSQL (master) \$

Lab report screen-shot #14:

aws Services Search for services, features, blogs, docs, and more [Option+S]

vocsstartsoft/User1564948-Nalongone_Dandank @ 1965-8090-7486 N. Virginia Support

DynamoDB

- Dashboard
- Tables
- Items** New
- PartiQL editor New
- Backups
- Exports to S3
- Reserved capacity

▼ DAX

- Clusters
- Subnet groups
- Parameter groups
- Events

Tell us what you think
Return to the previous console experience

DynamoDB > Items

Items info Autopreview

Tables (2)

Tag

Any table tag

Find tables by name

○ DandankStudents

● **pets**

► **pets**
Expand to query or scan items.

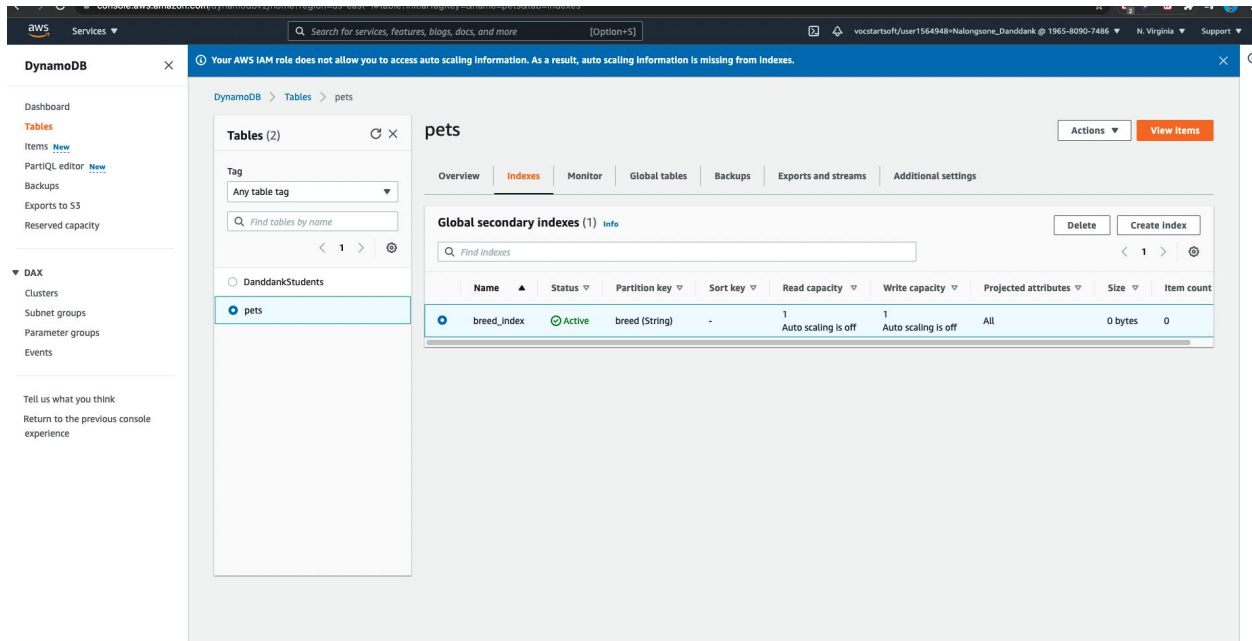
Items returned (9)

Actions Create Item

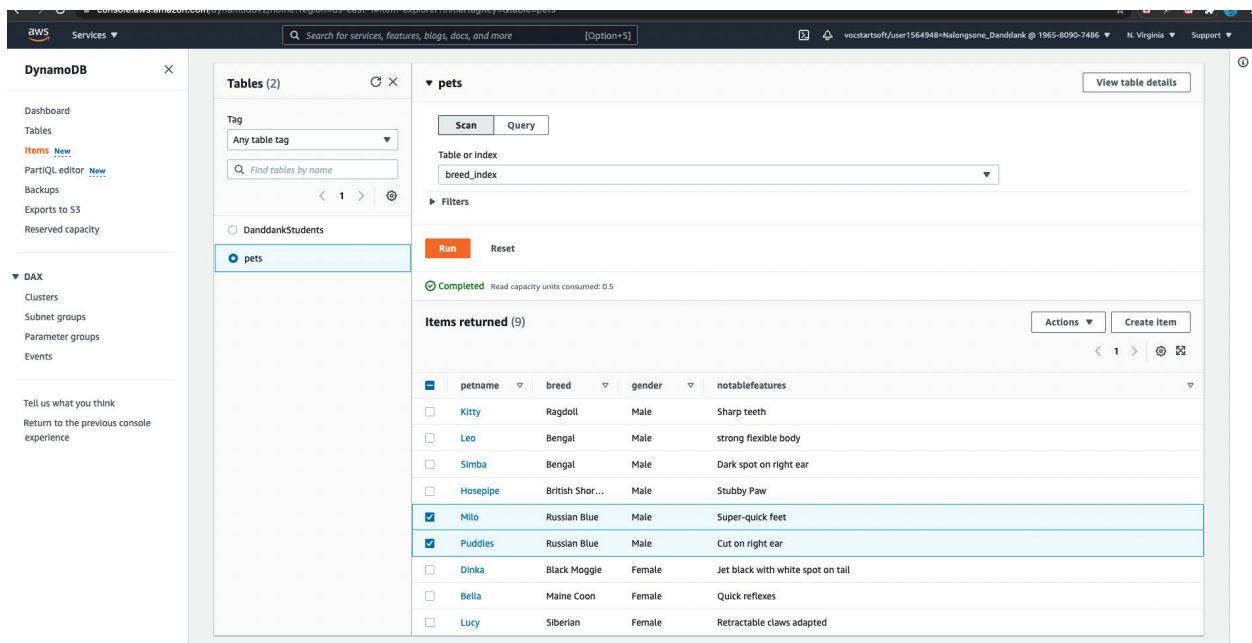
< 1 > ⚙

<input type="checkbox"/>	petname	breed	gender	notablefeatures
<input type="checkbox"/>	Leo	Bengal	Male	strong flexible body
<input type="checkbox"/>	Hosepipe	British Shor...	Male	Stubby Paw
<input type="checkbox"/>	Lucy	Siberian	Female	Retractable claws adapted
<input type="checkbox"/>	Kitty	Ragdoll	Male	Sharp teeth
<input type="checkbox"/>	Milo	Russian Blue	Male	Super-quick feet
<input type="checkbox"/>	Simba	Bengal	Male	Dark spot on right ear
<input type="checkbox"/>	Dinka	Black Moggie	Female	Jet black with white spot on tail
<input type="checkbox"/>	Puddles	Russian Blue	Male	Cut on right ear
<input type="checkbox"/>	Bella	Maine Coon	Female	Quick reflexes

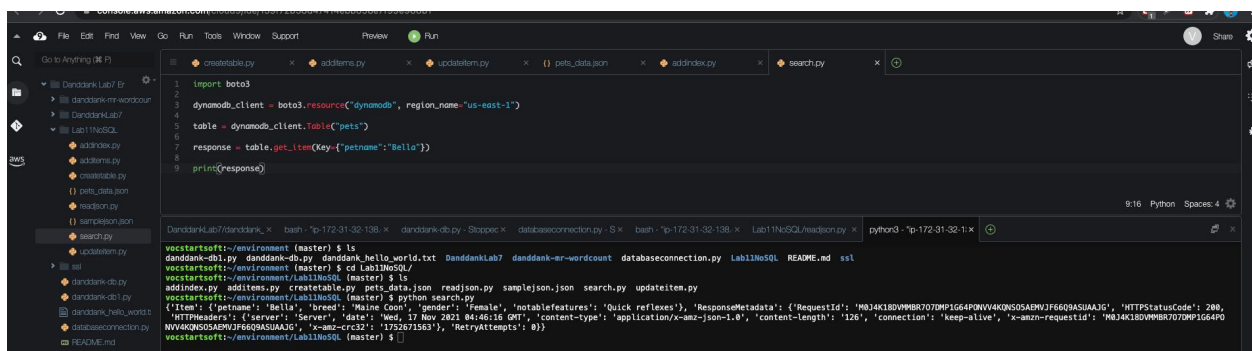
Lab report screen-shot #15:



Lab report screen-shot #16:



Lab report screen-shot #17:



Lab report screen-shot #18:


```
1 import boto3
2
3 dynamodb_client = boto3.resource("dynamodb", region_name="us-east-1")
4
5 table = dynamodb_client.Table("pets")
6
7 # response = table.get_item(Key={"petname": "Bella"})
8
9 # print(response)
10
11 res = table.scan()
12 items = res["Items"]
13 for item in items:
14     print(item["petname"], "-> item['breed'])
```

DandankLab7@dandank: ~ - bash - lp-172-31-32-138.x - dandank-db.py - Stopper x databaseconnection.py x S x bash - lp-172-31-32-138.x x Lab11NoSQL/readson.py x bash - lp-172-31-32-138.x x

vocstartsoft:~/environment (master) \$ ls
dandank-db.py dandank-hello_world.txt DandankLab7 dandank-ar-wordcount databaseconnection.py Lab11NoSQL README.md ssl
vocstartsoft:~/environment (master) \$ cd Lab11NoSQL/
vocstartsoft:~/environment/Lab11NoSQL (master) \$ ls
addindex.py additems.py createtable.py pets_data.json readson.py samplejson.json search.py updateitem.py
vocstartsoft:~/environment/Lab11NoSQL (master) \$ python search.py
{'Item': {'petname': 'Bella', 'breed': 'Maine Coon', 'gender': 'Female', 'notablefeatures': 'Quick reflexes'}, 'ResponseMetadata': {'RequestId': 'M0J4K18DWWMBR707DMP1664PQNVV4KQNS05ABWJF66Q9ASUAAJG', 'HTTPStatusCode': 200, 'HTTPHeaders': {'server': 'Server', 'date': 'Wed, 17 Nov 2021 04:46:16 GMT', 'content-type': 'application/x-amz-json-1.0', 'content-length': '126', 'connection': 'keep-alive', 'x-amzn-requestid': 'M0J4K18DWWMBR707DMP1664PQNVV4KQNS05ABWJF66Q9ASUAAJG', 'x-amz-crc32': '1152071853'}, 'RetryAttempts': 0}}
vocstartsoft:~/environment/Lab11NoSQL (master) \$ python search.py
Lucy Bengal
Hosepipe British Shorthair
Kitty Siberian
Milo Russian Blue
Simba Bengal
Diana Black Moggie
Puddles Russian Blue
Bella Maine Coon
vocstartsoft:~/environment/Lab11NoSQL (master) \$

Lab report screen-shot #19:

```
1 import boto3
2 from boto3.dynamodb.conditions import Key
3
4 dynamodb_client = boto3.resource("dynamodb", region_name="us-east-1")
5
6 table = dynamodb_client.Table("pets")
7
8 # response = table.get_item(Key={"petname": "Bella"})
9
10 # print(response)
11
12 petname = "Puddles"
13 res = table.query(
14     KeyConditionExpression=Key("petname").eq(petname),
15     ProjectionExpression="notablefeatures"
16 )
17 print(res)
18
19 # response = table.get_item(Key={"petname": "Bella"})
20
21 # print(response)
22
23 # res = table.scan()
24 # items = res["Items"]
```

DandankLab7@dandank: ~ - bash - lp-172-31-32-138.x - dandank-db.py - Stopper x databaseconnection.py x S x bash - lp-172-31-32-138.x x Lab11NoSQL/readson.py x bash - lp-172-31-32-138.x x

vocstartsoft:~/environment (master) \$ python search.py
{'Items': [{'notablefeatures': 'Cut on right ear'}], 'Count': 1, 'ScannedCount': 1, 'ResponseMetadata': {'RequestId': '0NC82AGARBDDPFCIFD8T0CFVWV4KQNS05ABWJF66Q9ASUAAJG', 'HTTPStatusCode': 200, 'HTTPHeaders': {'server': 'Server', 'date': 'Wed, 17 Nov 2021 05:22:23 GMT', 'content-type': 'application/x-amz-json-1.0', 'content-length': '183', 'connection': 'keep-alive', 'x-amzn-requestid': '0NC82AGARBDDPFCIFD8T0CFVWV4KQNS05ABWJF66Q9ASUAAJG', 'x-amz-crc32': '983468157'}, 'RetryAttempts': 0}}
vocstartsoft:~/environment/Lab11NoSQL (master) \$ clear
vocstartsoft:~/environment/Lab11NoSQL (master) \$ python search.py
{'Items': [{'notablefeatures': 'Cut on right ear'}], 'Count': 1, 'ScannedCount': 1, 'ResponseMetadata': {'RequestId': '0BQ073GWB82P4E684F15HLEJVV4KQNS05ABWJF66Q9ASUAAJG', 'HTTPStatusCode': 200, 'HTTPHeaders': {'server': 'Server', 'date': 'Wed, 17 Nov 2021 05:22:32 GMT', 'content-type': 'application/x-amz-json-1.0', 'content-length': '183', 'connection': 'keep-alive', 'x-amzn-requestid': '0BQ073GWB82P4E684F15HLEJVV4KQNS05ABWJF66Q9ASUAAJG', 'x-amz-crc32': '983468157'}, 'RetryAttempts': 0}}
vocstartsoft:~/environment/Lab11NoSQL (master) \$

Lab report screen-shot #20:

```
1 import boto3
2 from boto3.dynamodb.conditions import Key
3
4 dynamodb_client = boto3.resource("dynamodb", region_name="us-east-1")
5
6 table = dynamodb_client.Table("pets")
7
8 breed = "Russian Blue"
9 res = table.query(
10     IndexName="breed_index",
11     KeyConditionExpression=Key("breed").eq(breed)
12 )
13 print(res)
```

DandankLab7@dandank: ~ - bash - lp-172-31-32-138.x - dandank-db.py - Stopper x databaseconnection.py x S x bash - lp-172-31-32-138.x x Lab11NoSQL/readson.py x python3 - lp-172-31-32-138.x x

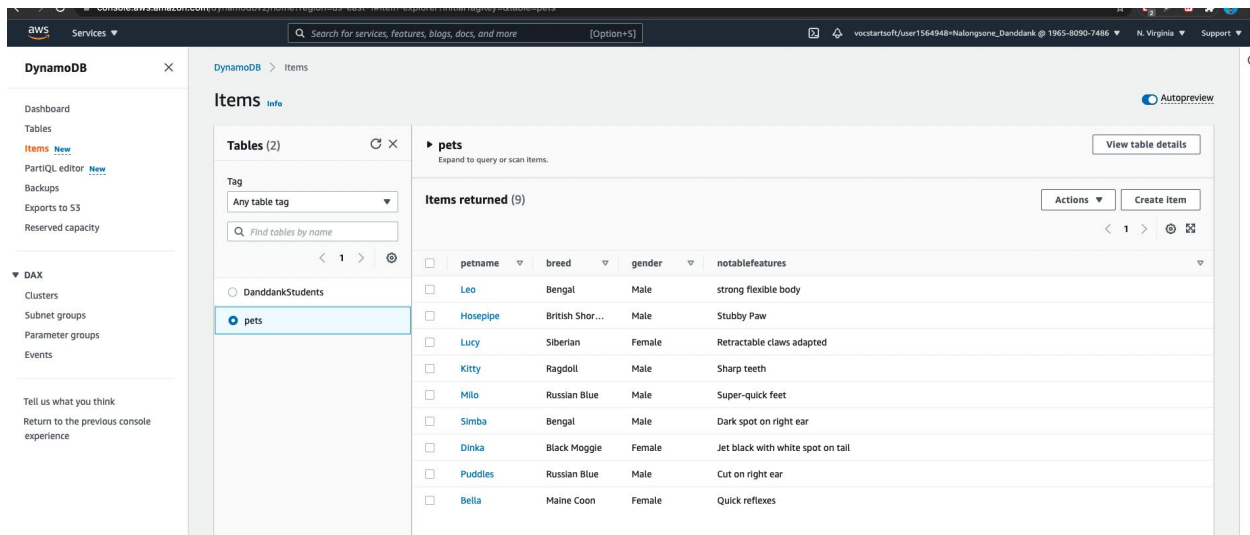
vocstartsoft:~/environment/Lab11NoSQL (master) \$ python search.py
{'Items': [{'petname': 'Milo', 'breed': 'Russian Blue', 'gender': 'Male', 'notablefeatures': 'Super-quick feet'}, {'petname': 'Puddles', 'breed': 'Russian Blue', 'gender': 'Male', 'notablefeatures': 'Cut on right ear'}], 'Count': 2, 'ScannedCount': 2, 'ResponseMetadata': {'RequestId': '0C73RT0Q6P9MWZ07FHEA6PHTV4KQNS05ABWJF66Q9ASUAAJG', 'HTTPStatusCode': 200, 'HTTPHeaders': {'server': 'Server', 'date': 'Wed, 17 Nov 2021 05:22:23 GMT', 'content-type': 'application/x-amz-json-1.0', 'content-length': '279', 'connection': 'keep-alive', 'x-amzn-requestid': '0C73RT0Q6P9MWZ07FHEA6PHTV4KQNS05ABWJF66Q9ASUAAJG', 'x-amz-crc32': '1149964981'}, 'RetryAttempts': 0}}
vocstartsoft:~/environment/Lab11NoSQL (master) \$

```
5 table = dynamodb_client.Table("pets")
6 breed = "Russian Blue"
7
8 res = table.query(
9     IndexName="breed_index",
10     KeyConditionExpression=Key("breed").eq(breed)
11 )
12
13 for item in res["Items"]:
14     print(item)
15
16 # petname = "Puddles"
17 # res = table.query(
18 #     KeyConditionExpression=Key("petname").eq(petname),
19 #     ProjectionExpression="notablefeatures"
```

DandankLab7@dandank: ~ - bash - lp-172-31-32-138.x - dandank-db.py - Stopper x databaseconnection.py x S x bash - lp-172-31-32-138.x x Lab11NoSQL/readson.py x bash - lp-172-31-32-138.x x

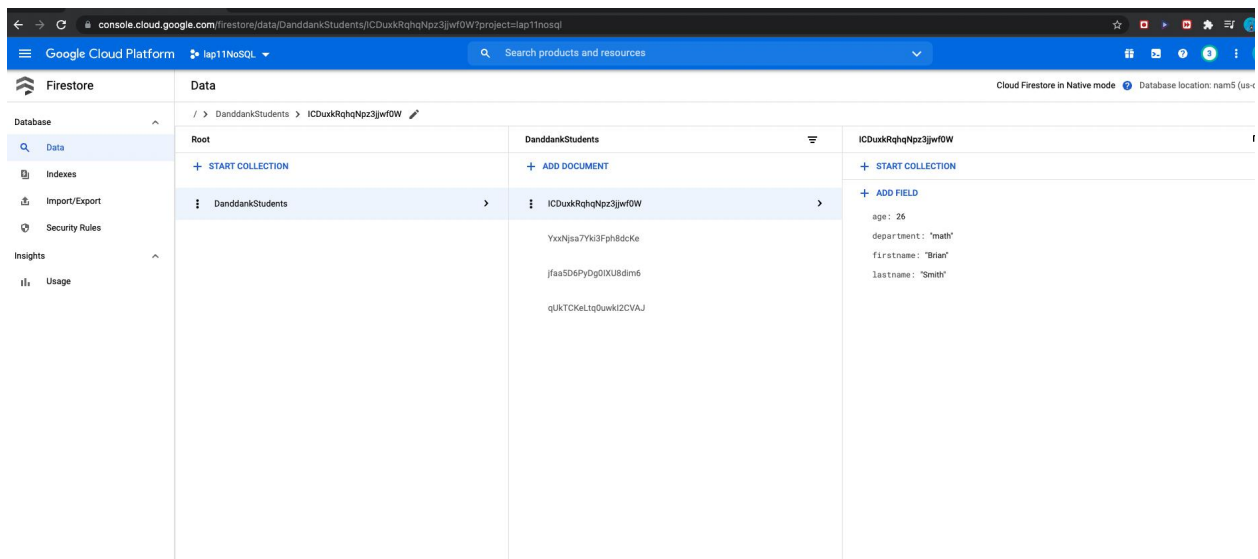
vocstartsoft:~/environment/Lab11NoSQL (master) \$ python search.py
{'petname': 'Milo', 'breed': 'Russian Blue', 'gender': 'Male', 'notablefeatures': 'Super-quick feet'}
{'petname': 'Puddles', 'breed': 'Russian Blue', 'gender': 'Male', 'notablefeatures': 'Cut on right ear'}
vocstartsoft:~/environment/Lab11NoSQL (master) \$

Lab report screen-shot #21:



Exercise 3: Google Firestore Document Database

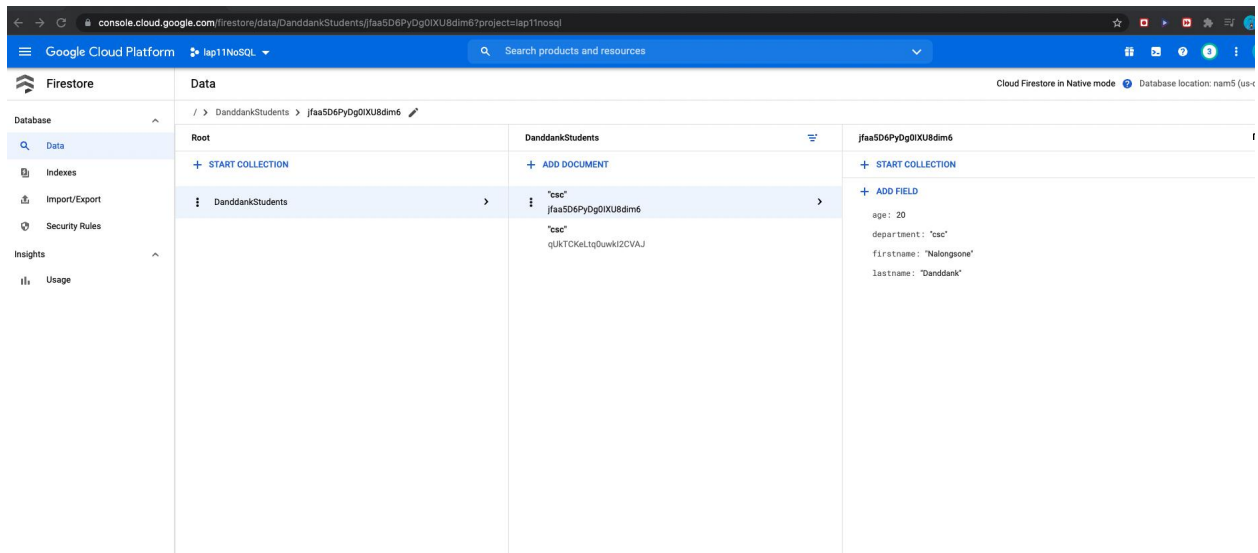
Lab report screen-shot #22:



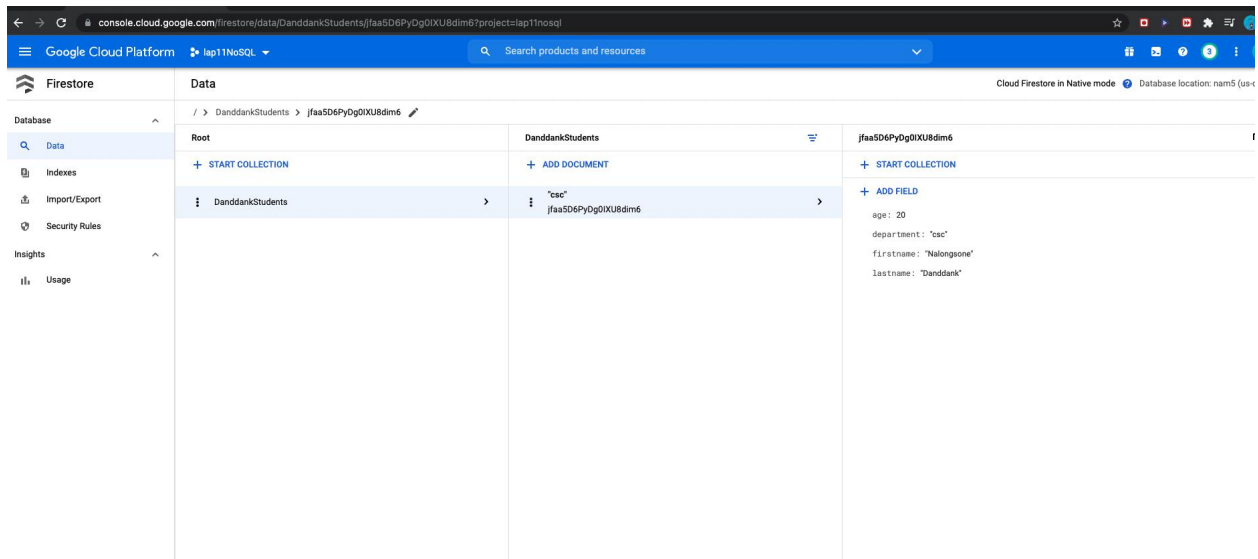
Lab report screen-shot #23:

`.collection("DanddankStudents")`

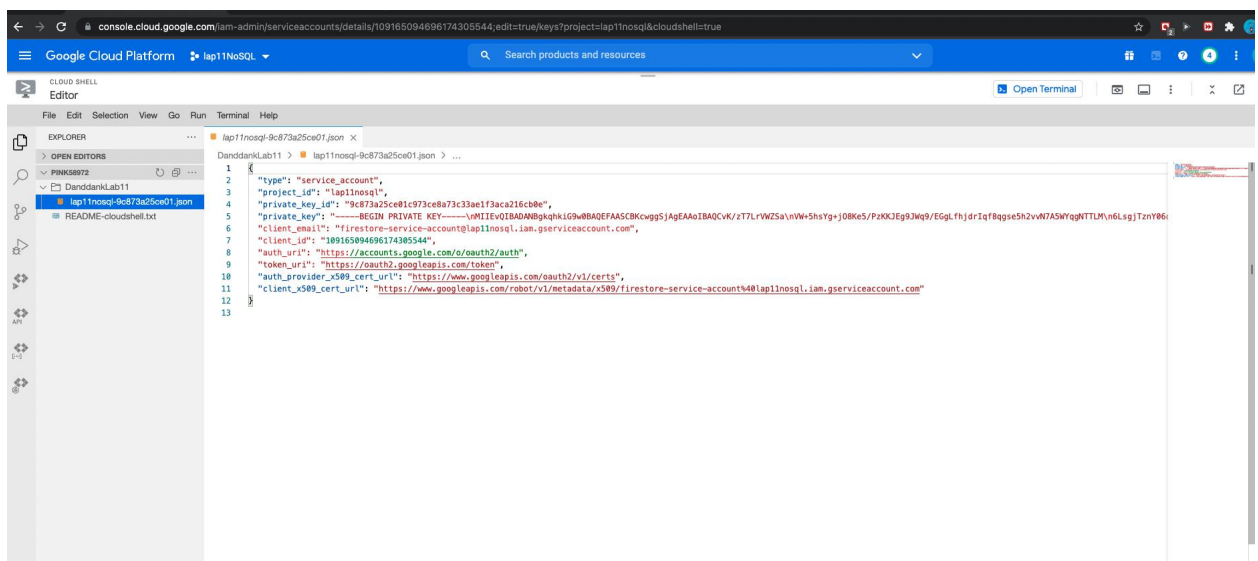
`.where("department", "==", "csc")`



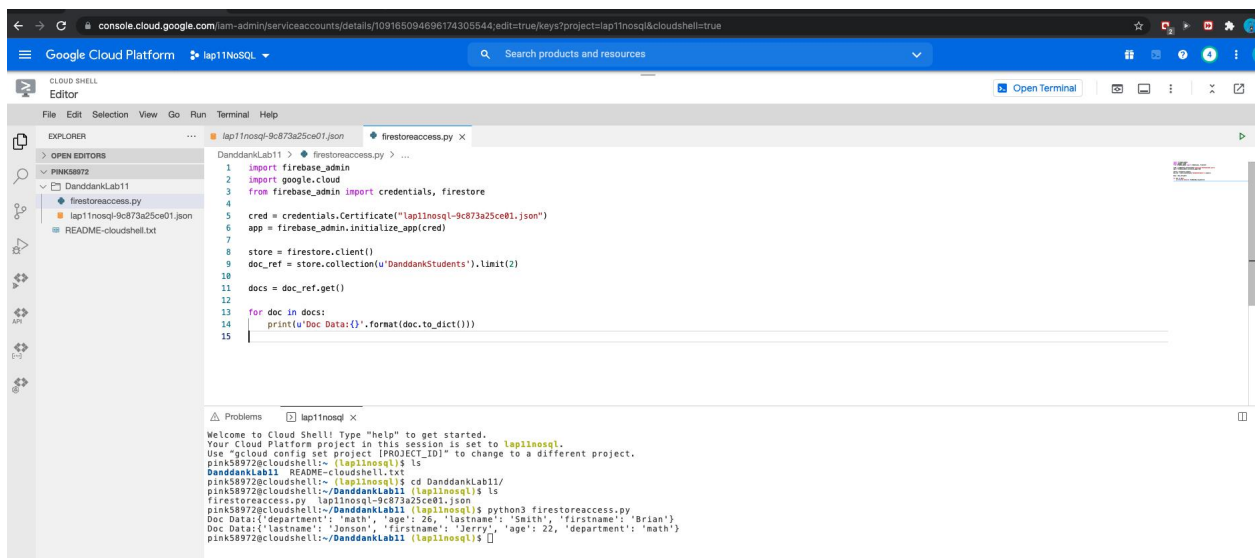
Lab report screen-shot #24:



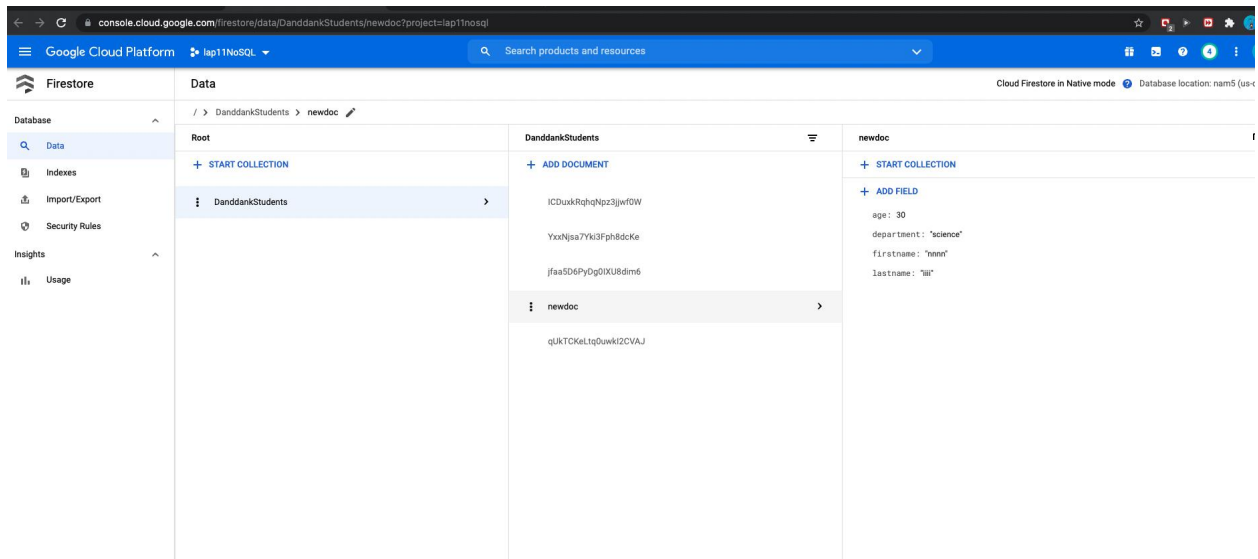
Lab report screen-shot #25:



Lab report screen-shot #26:



Lab report screen-shot #27:



Lab report screen-shot #28:

