ASSIGNMENT - 3
PART A:Build an event-driven serverless Application

SUBMITTED TO: Prof. SAURABH DEY

SUBMITTED BY: DHRUV DOSHI
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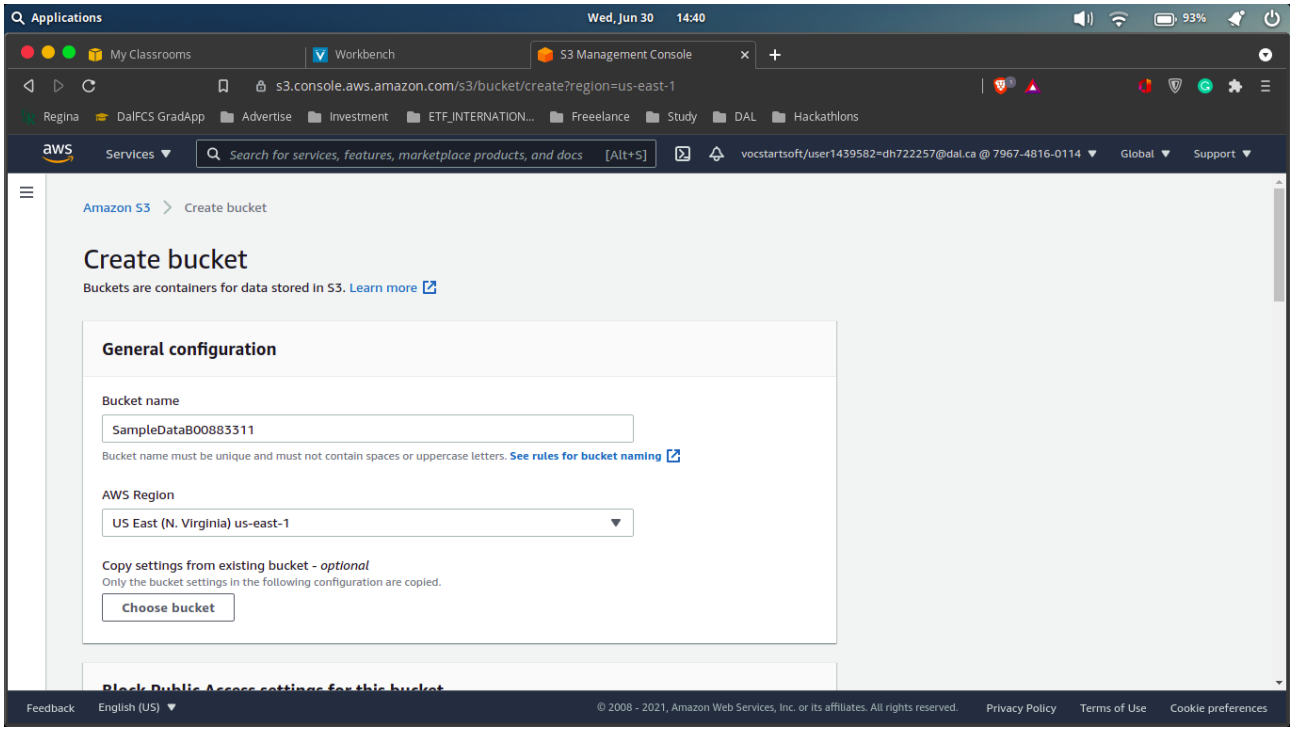
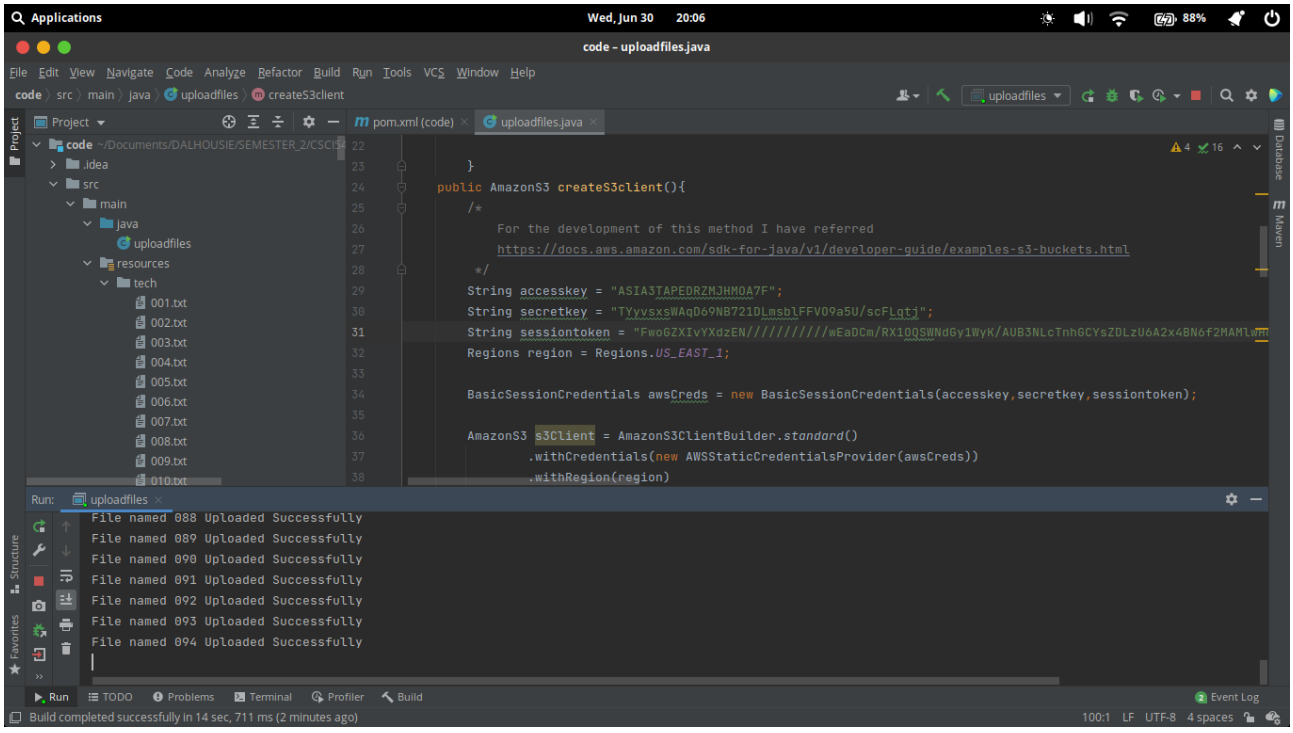
FIND WHOLE CODE AT GITLAB:
https://git.cs.dal.ca/doshi/dhruv-csci5410-summer/-/tree/master/assignment_3

There is a series of Screenshots which explains the whole process.

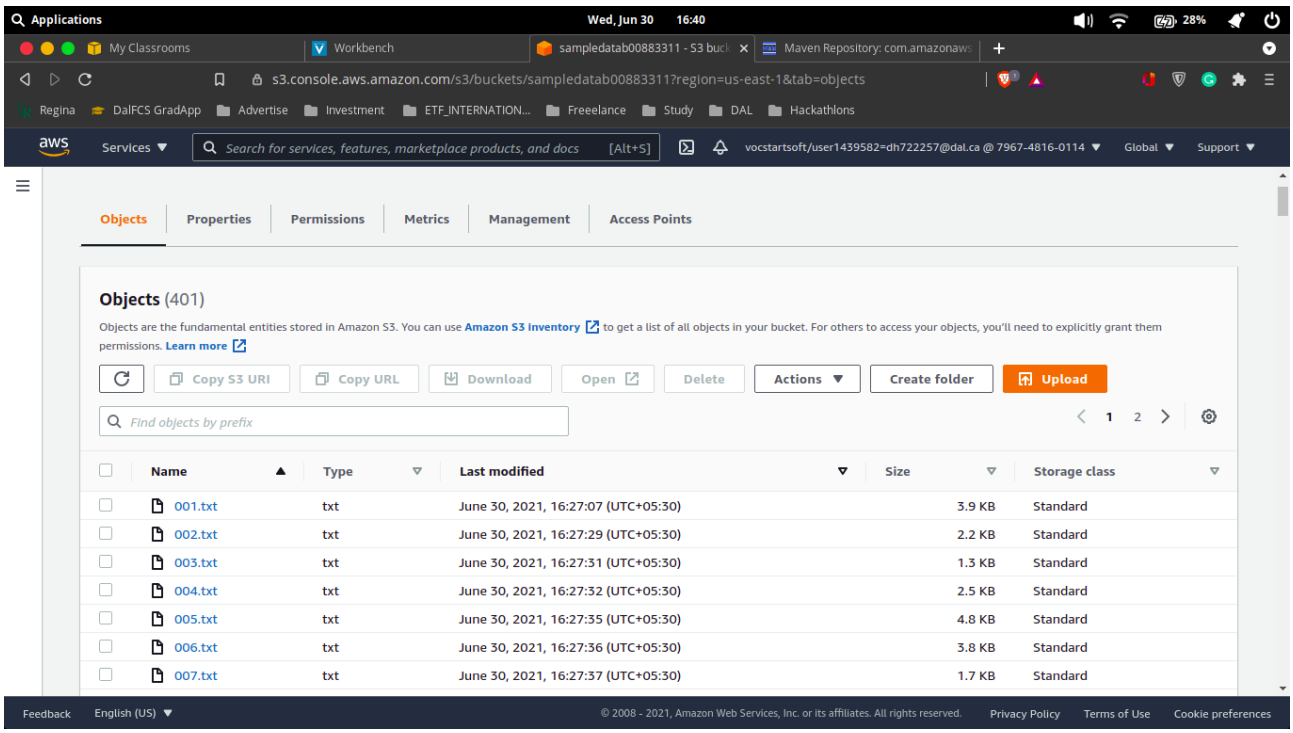
Create S3 Bucket to save data 401 extracted files



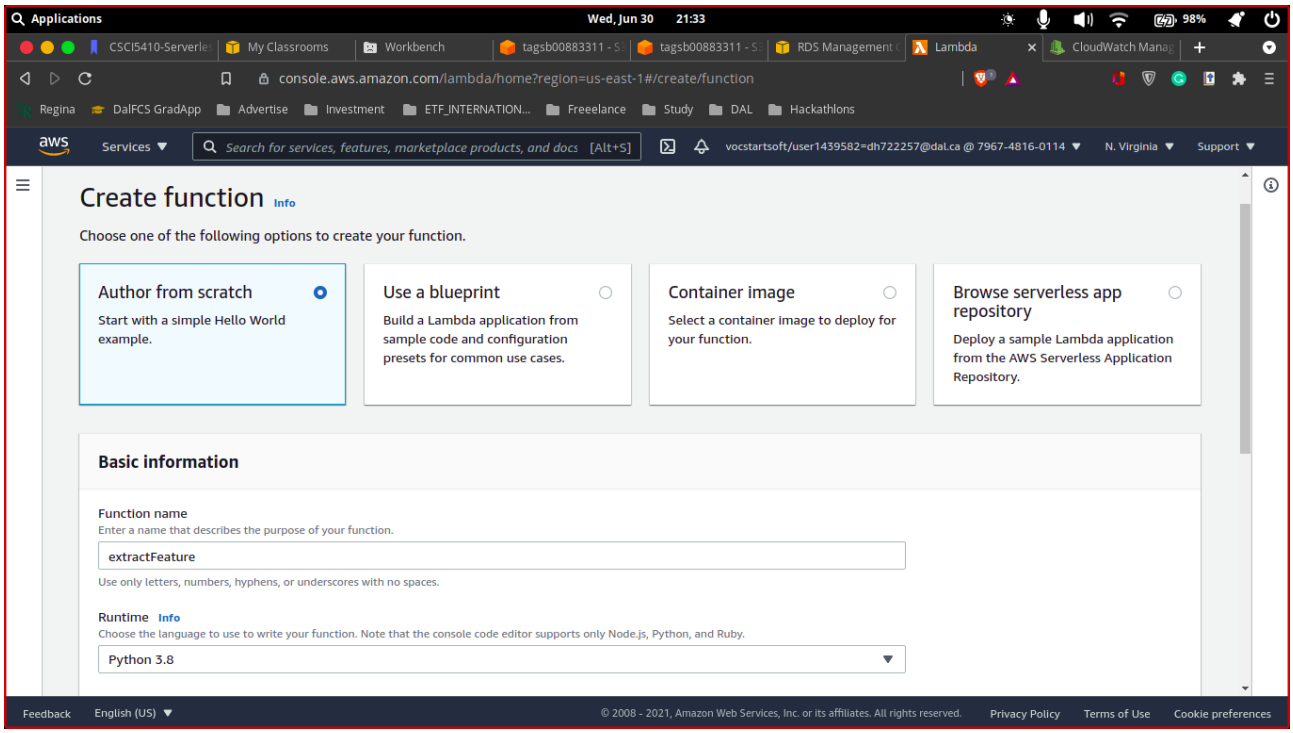
Java code for pushing files to S3 Bucket



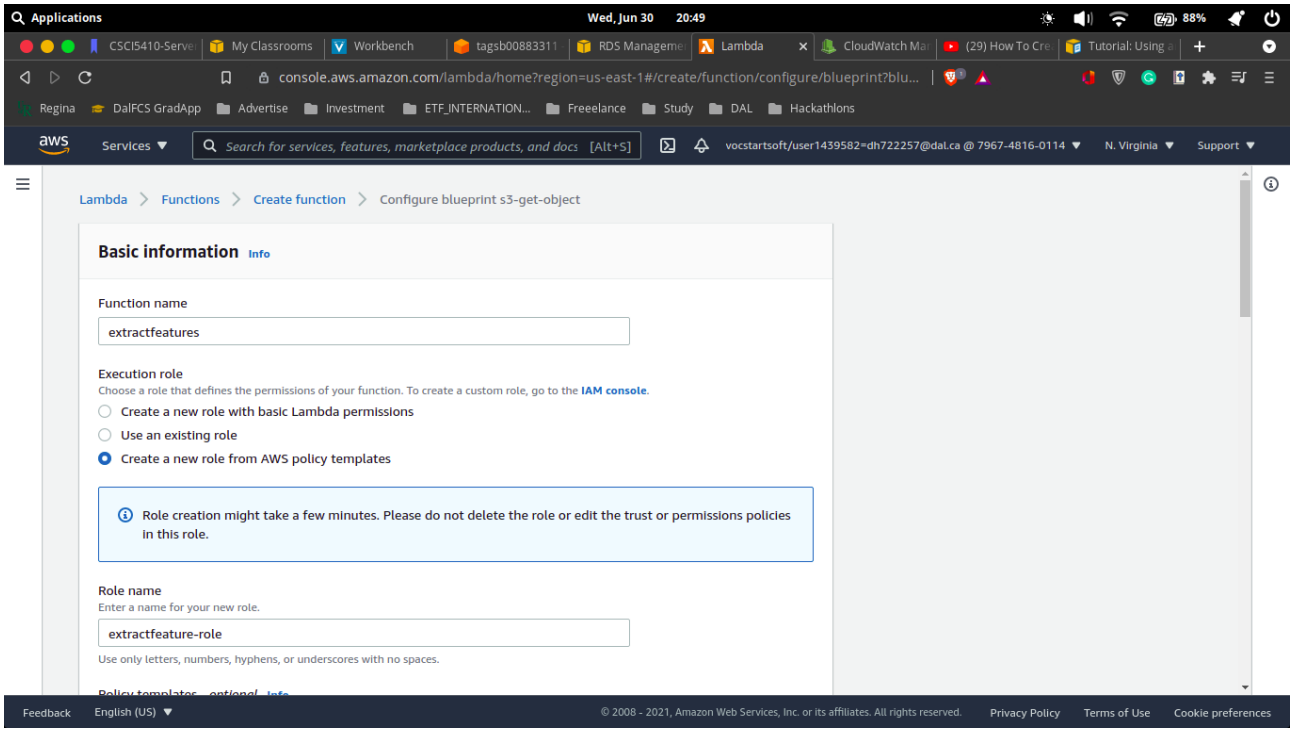
After Uploading data to S3



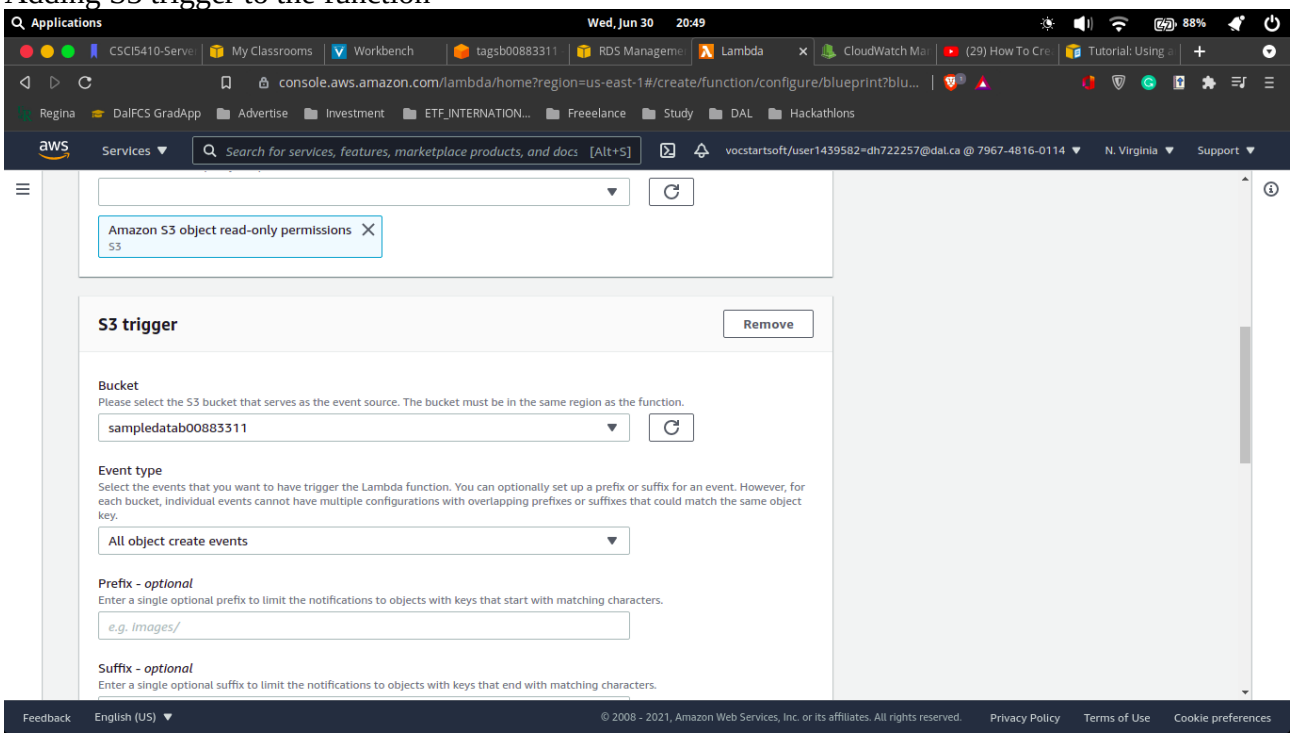
Creating new lambda function



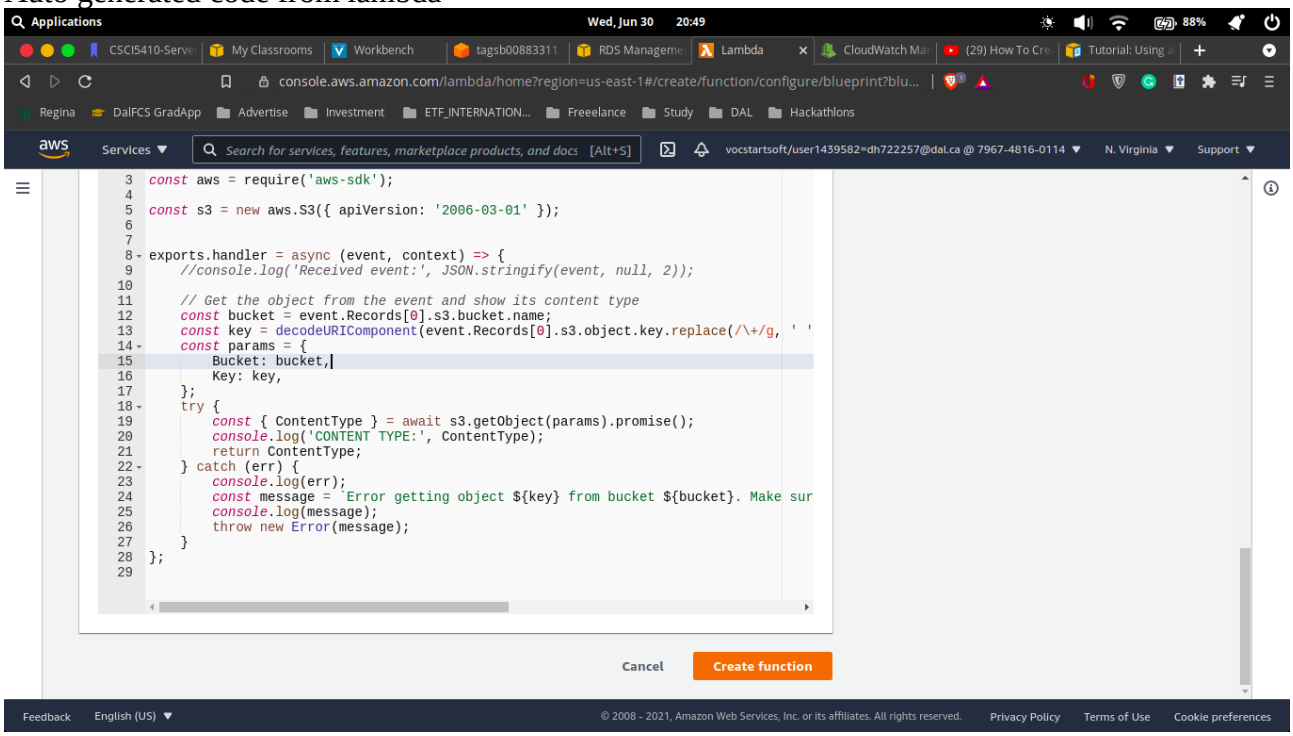
Creating a function



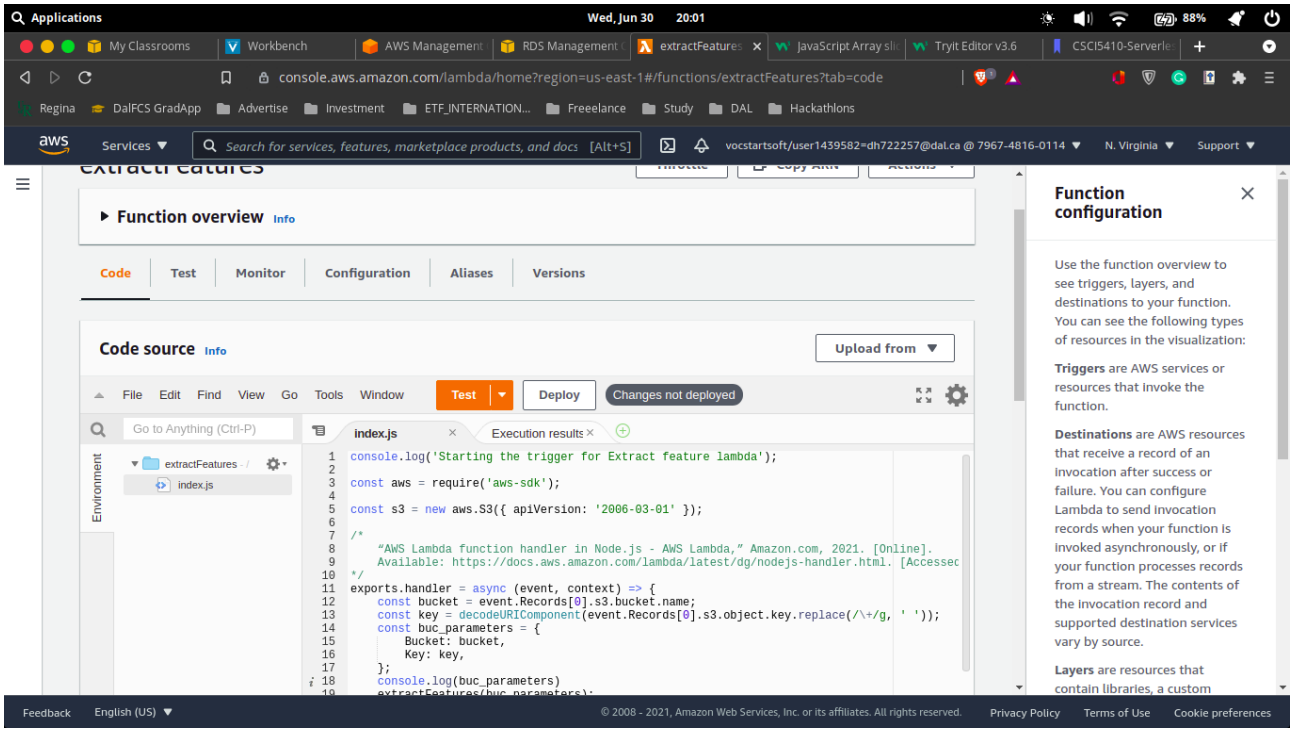
Adding S3 trigger to the function



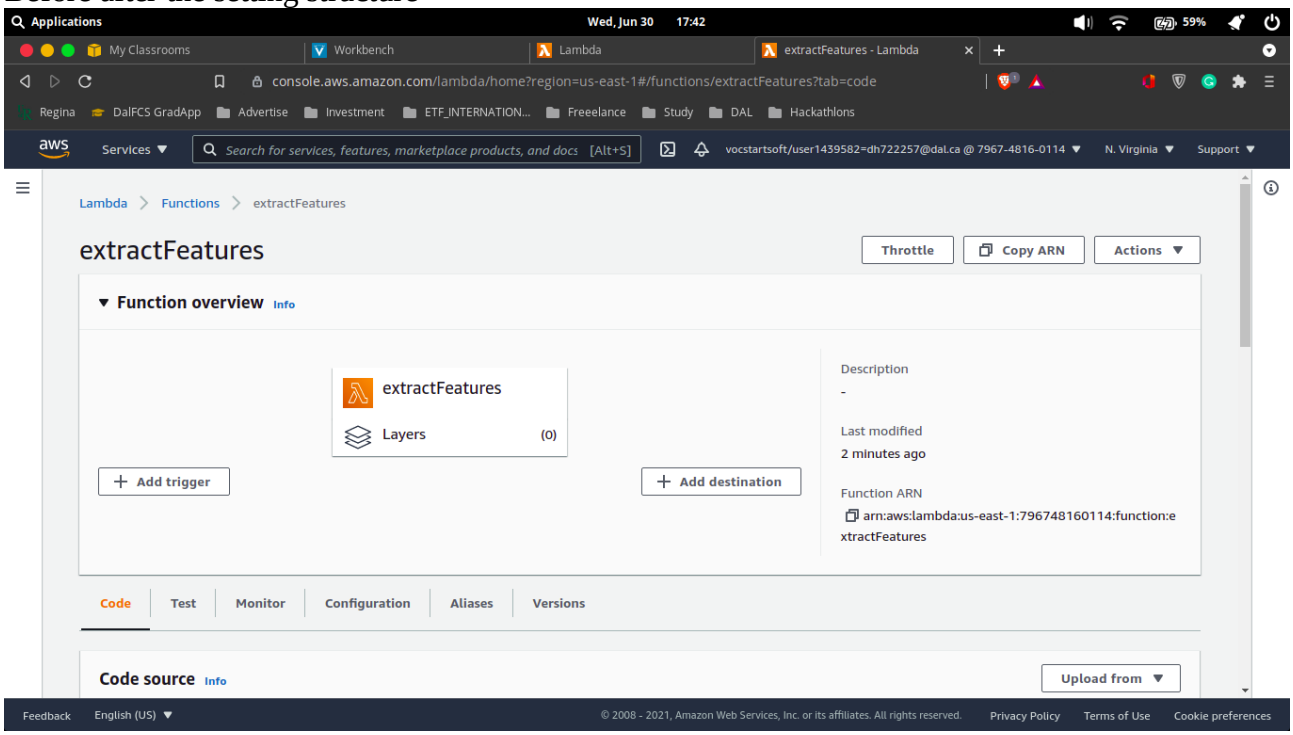
Auto generated code from lambda



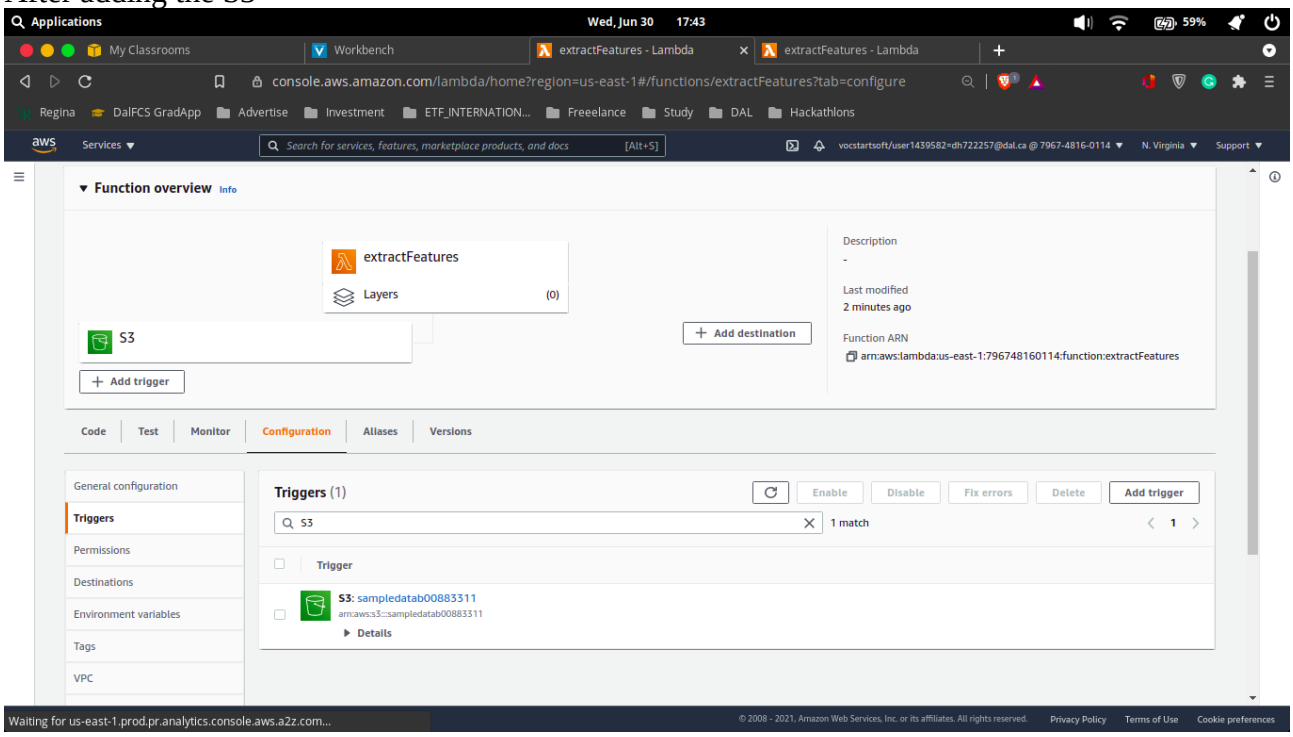
Extractfeature code uploading



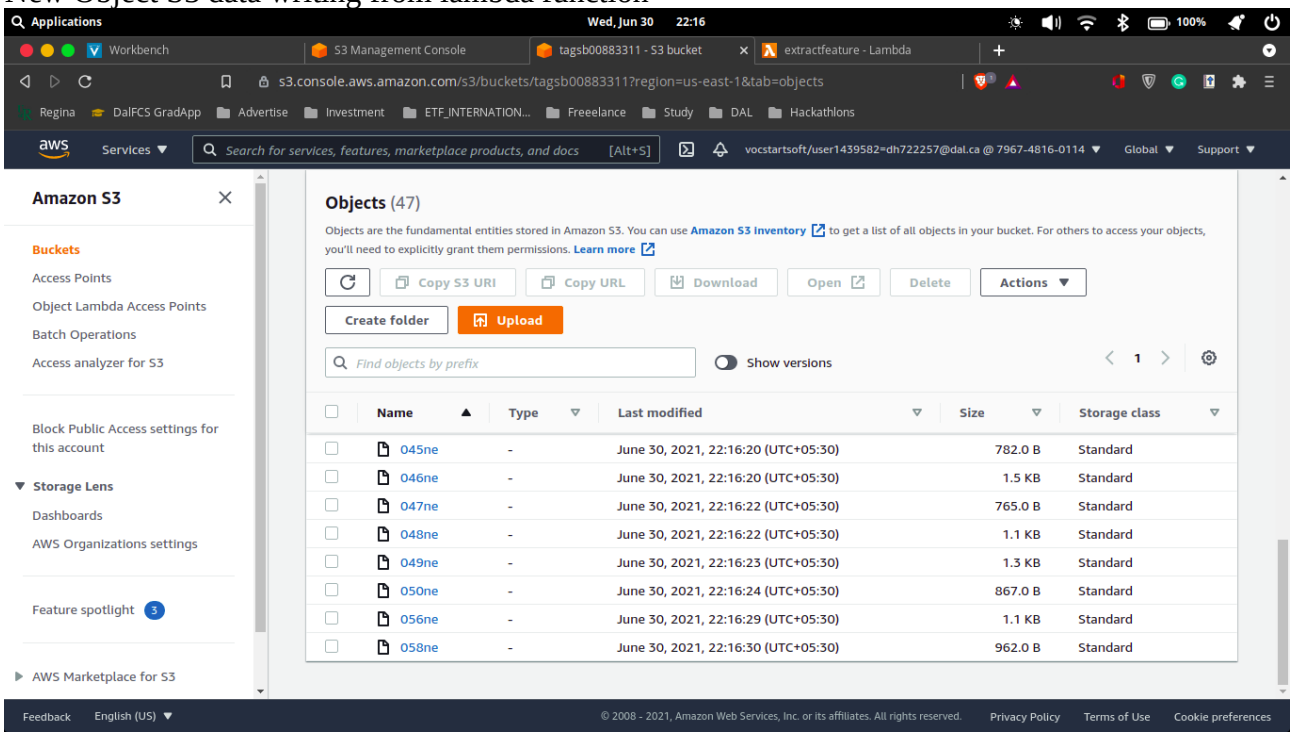
Before after the setting structure



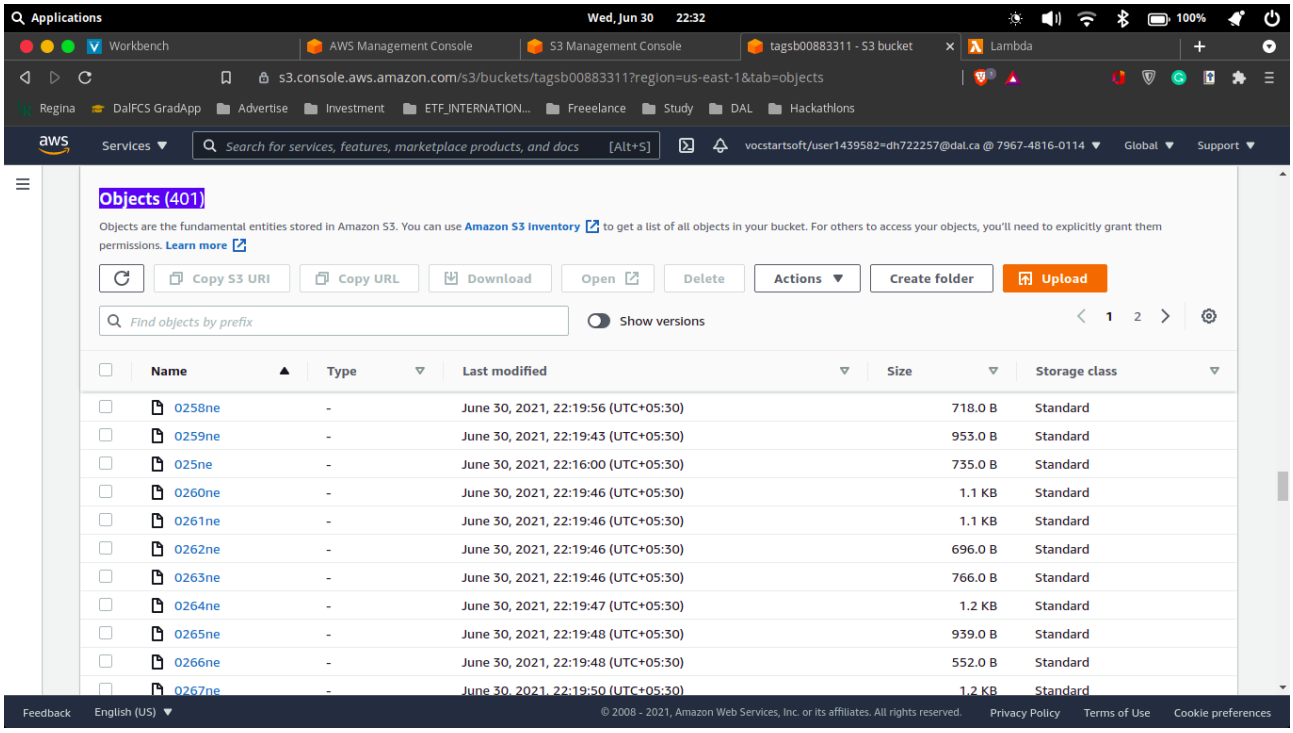
After adding the S3



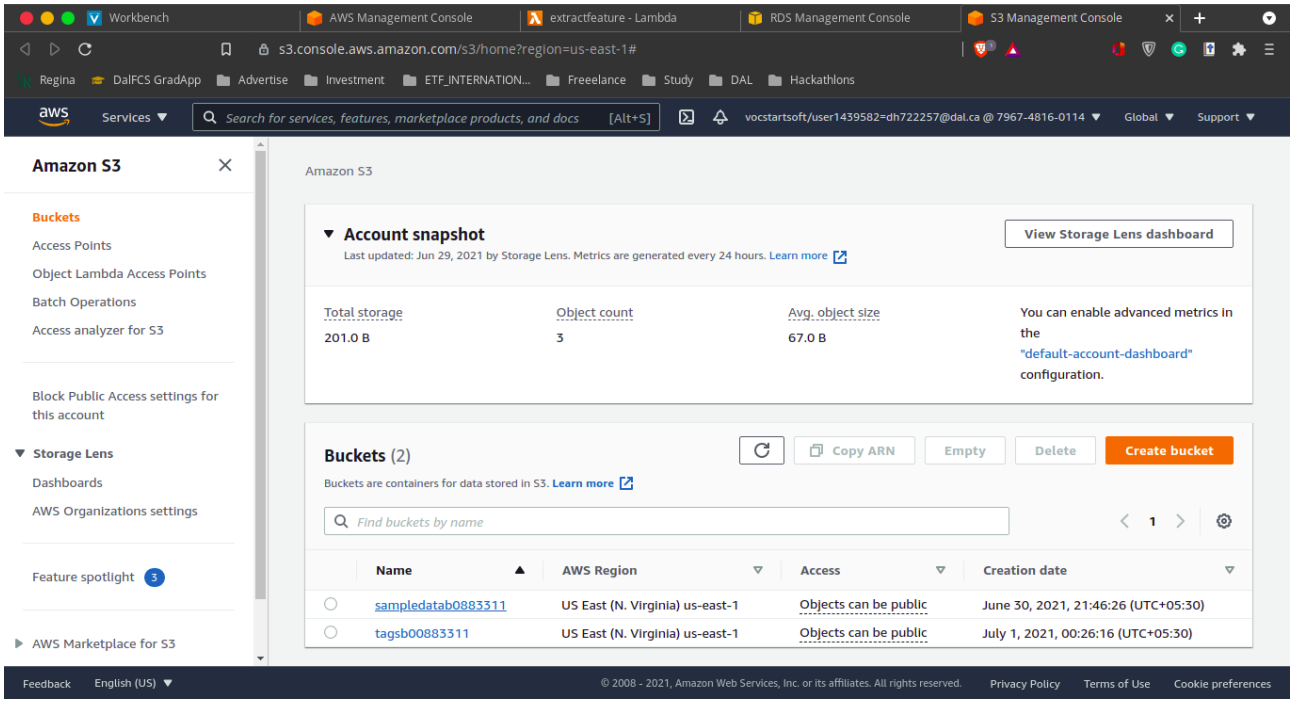
New Object S3 data writing from lambda function



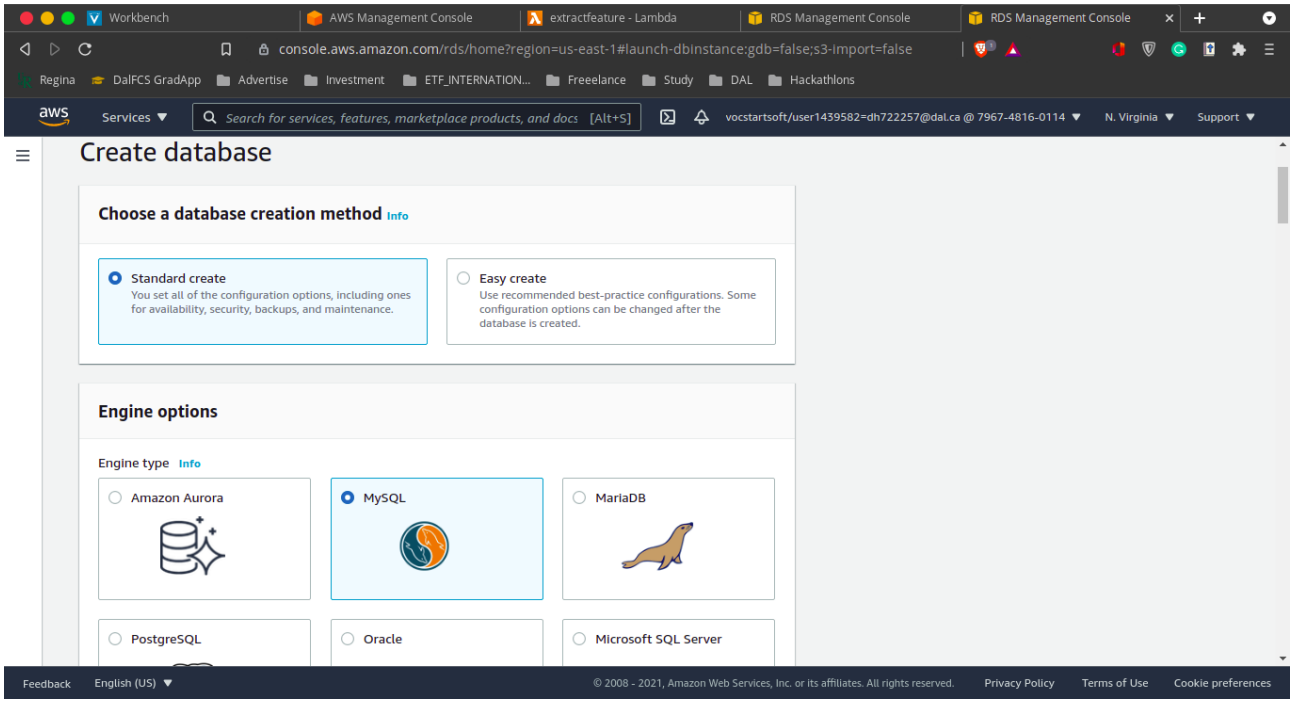
Completion of data adding by lambda function (401 files for 401 input files)



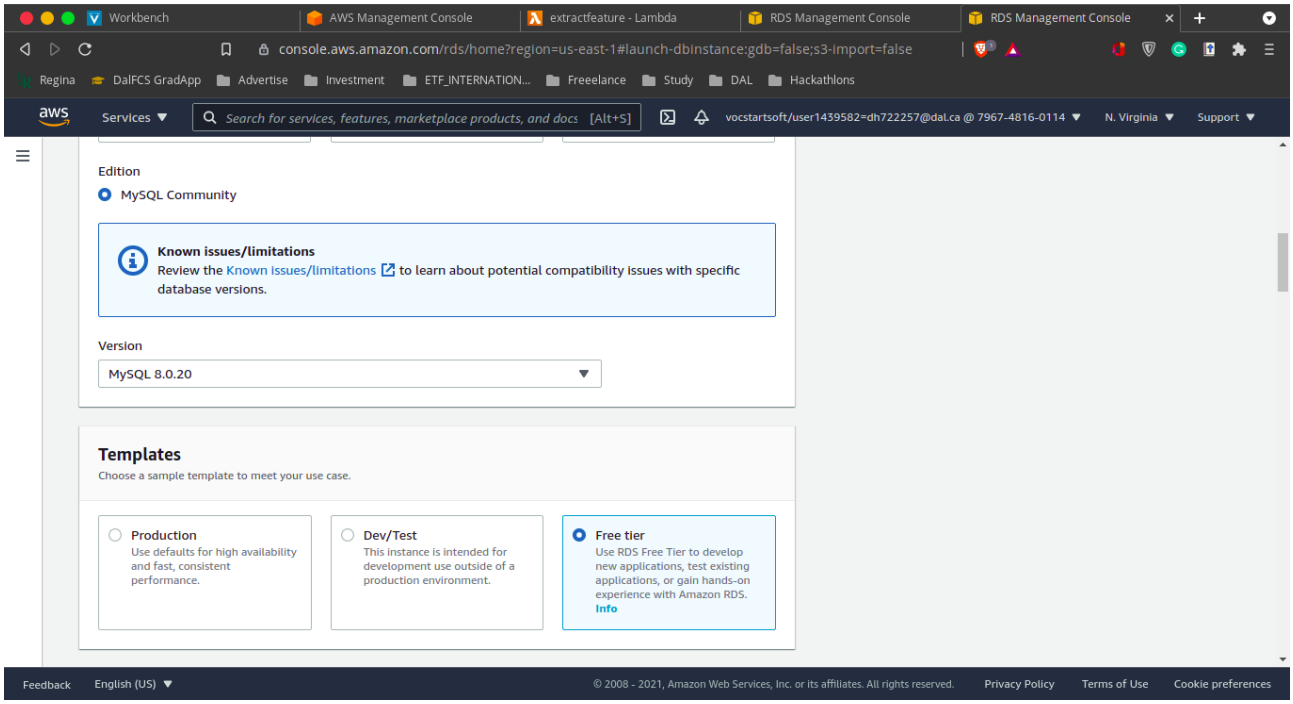
Final Structure of S3



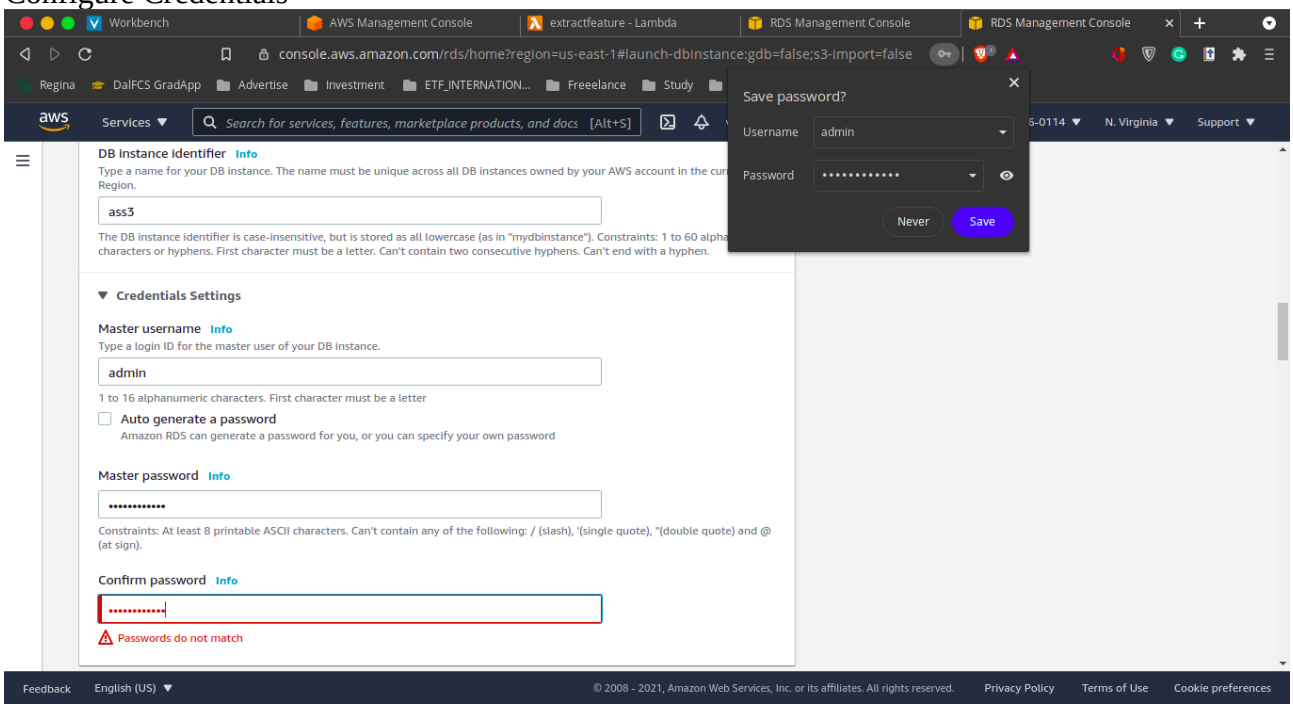
RDS DB CREATION



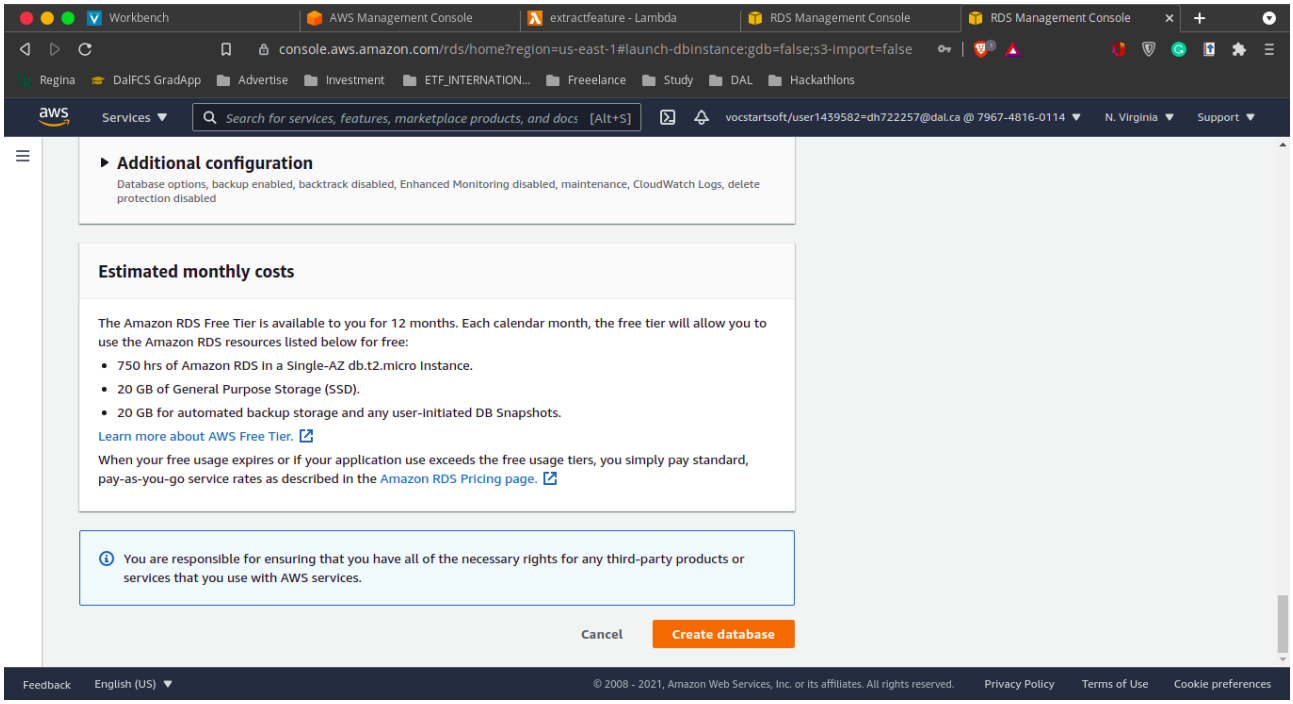
Free tear selection



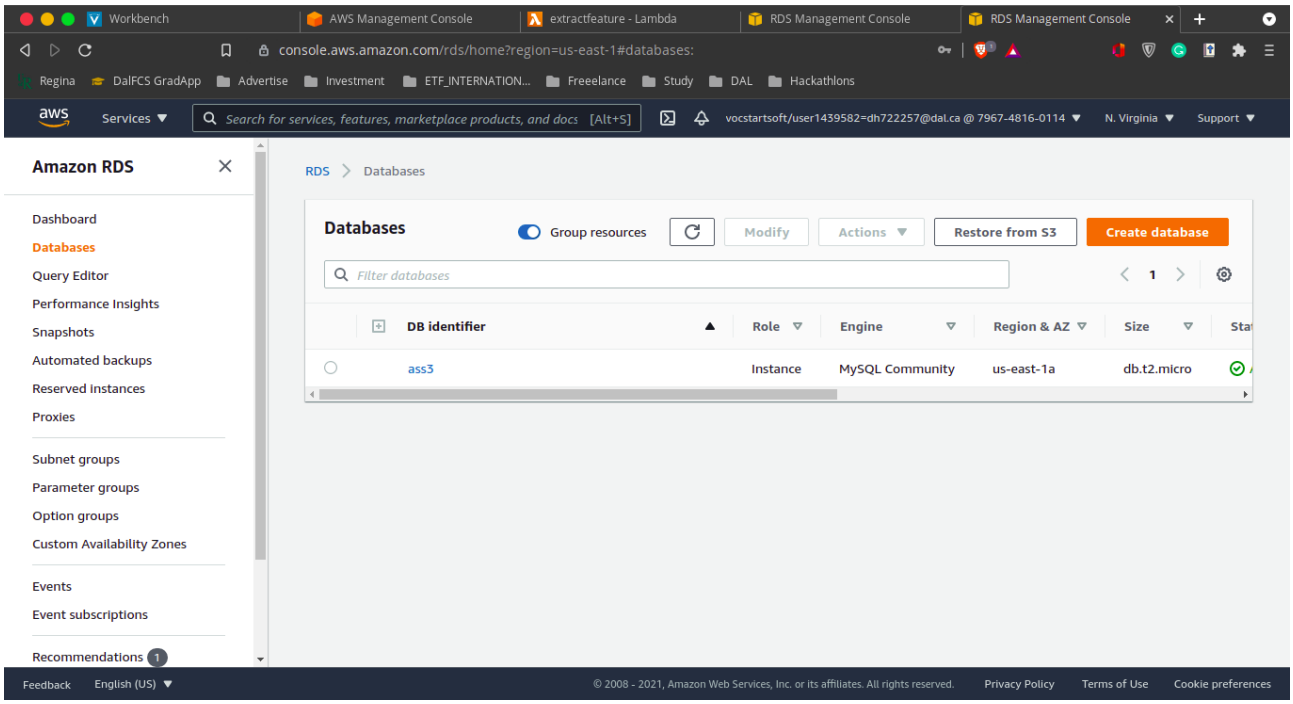
Configure Credentials



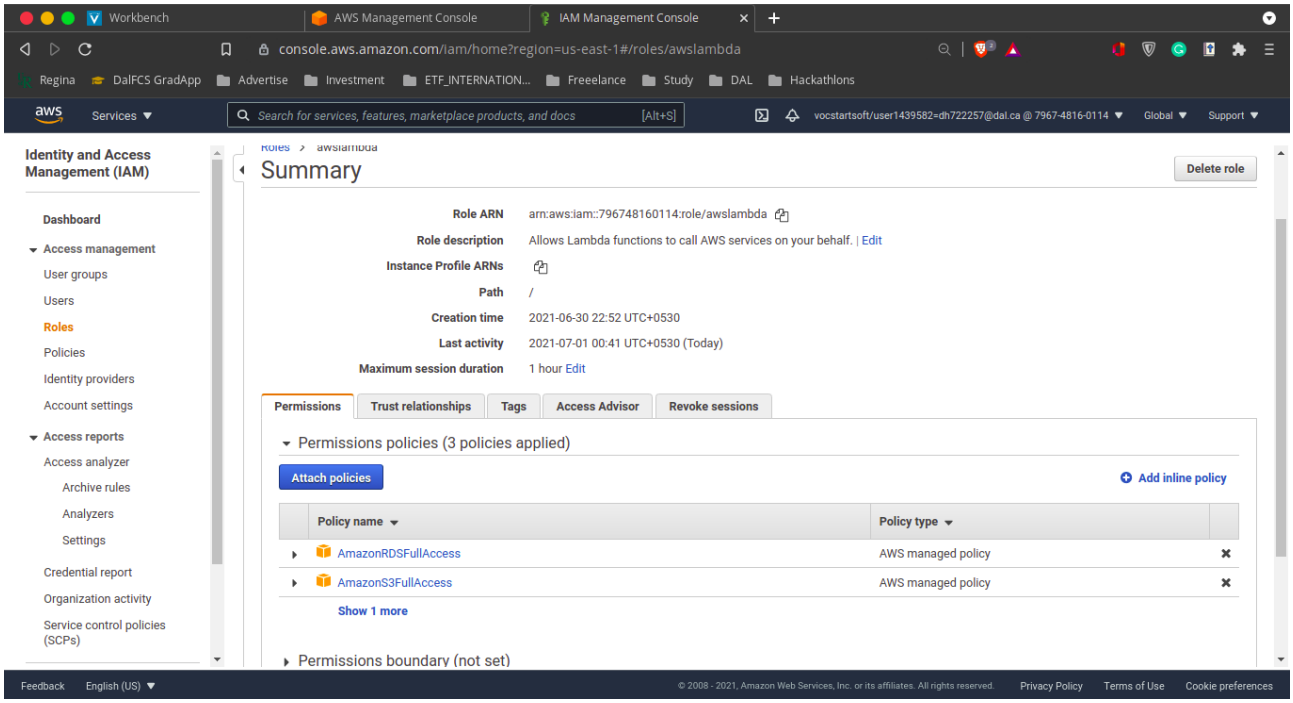
Click and RDS is ready



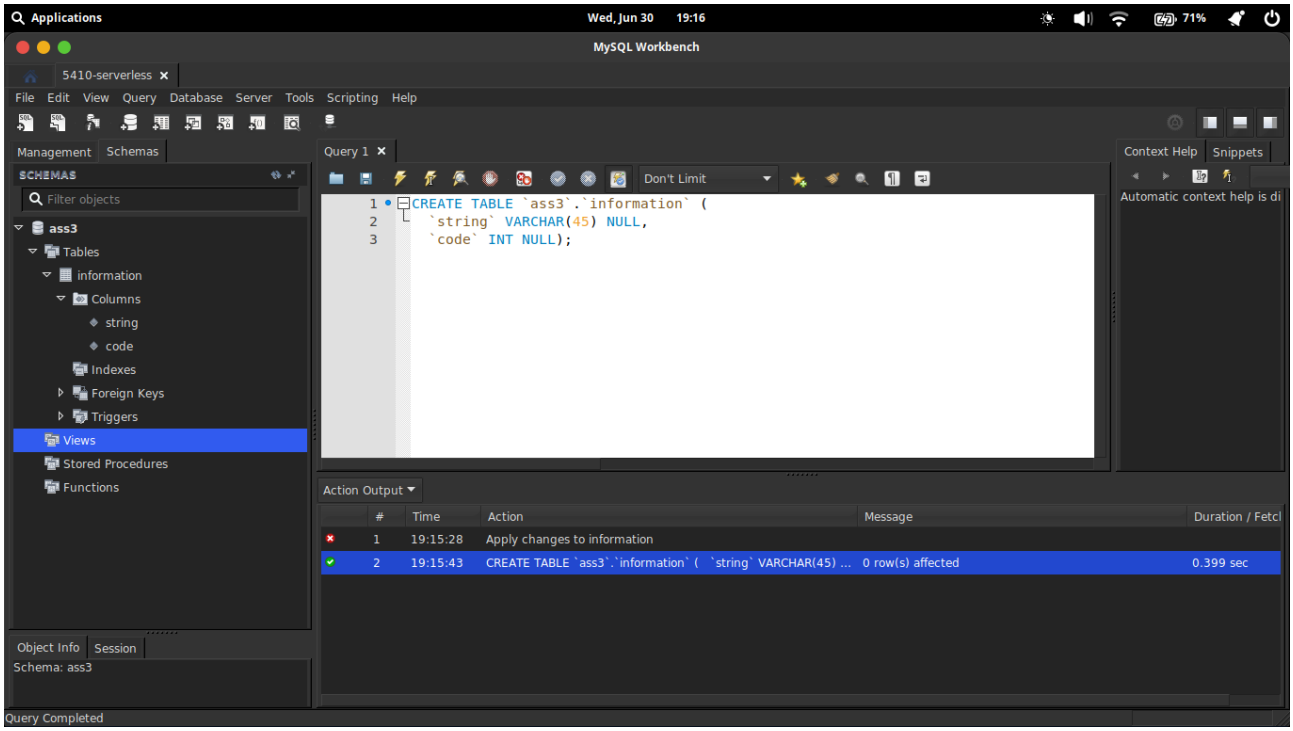
RDS is up and running



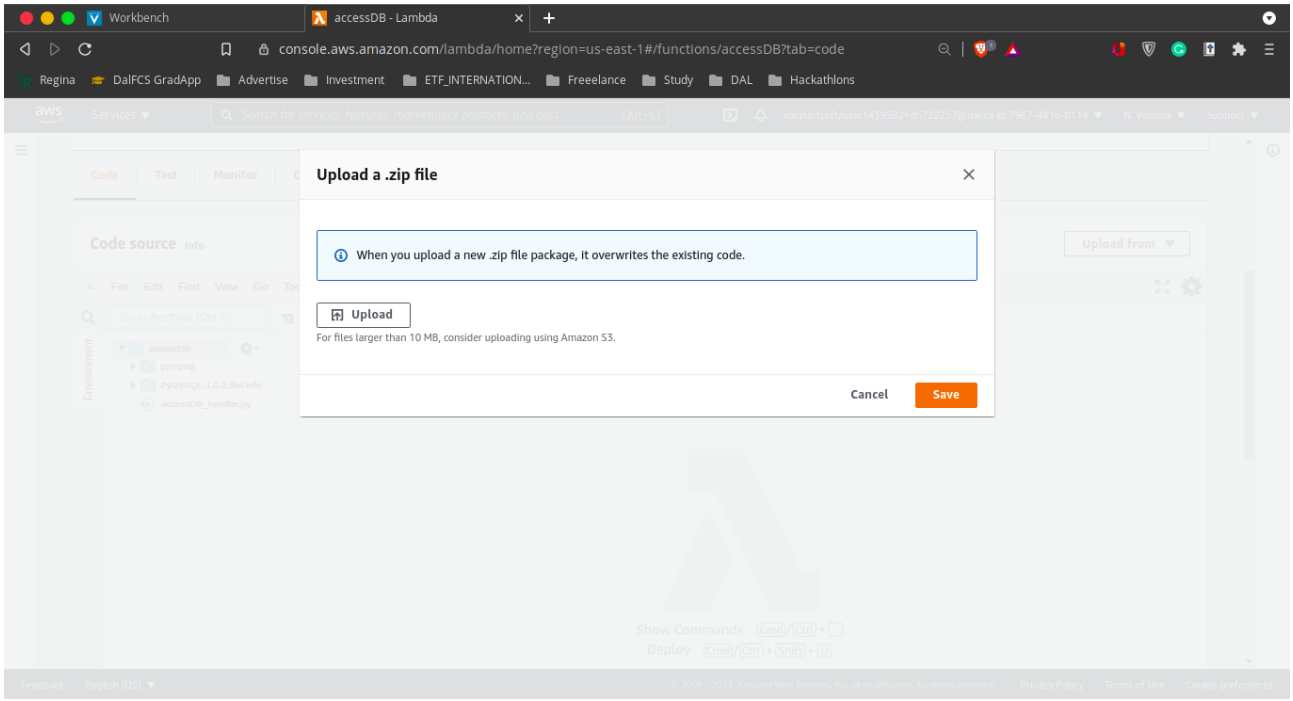
IAM: RDS rule for Lambda



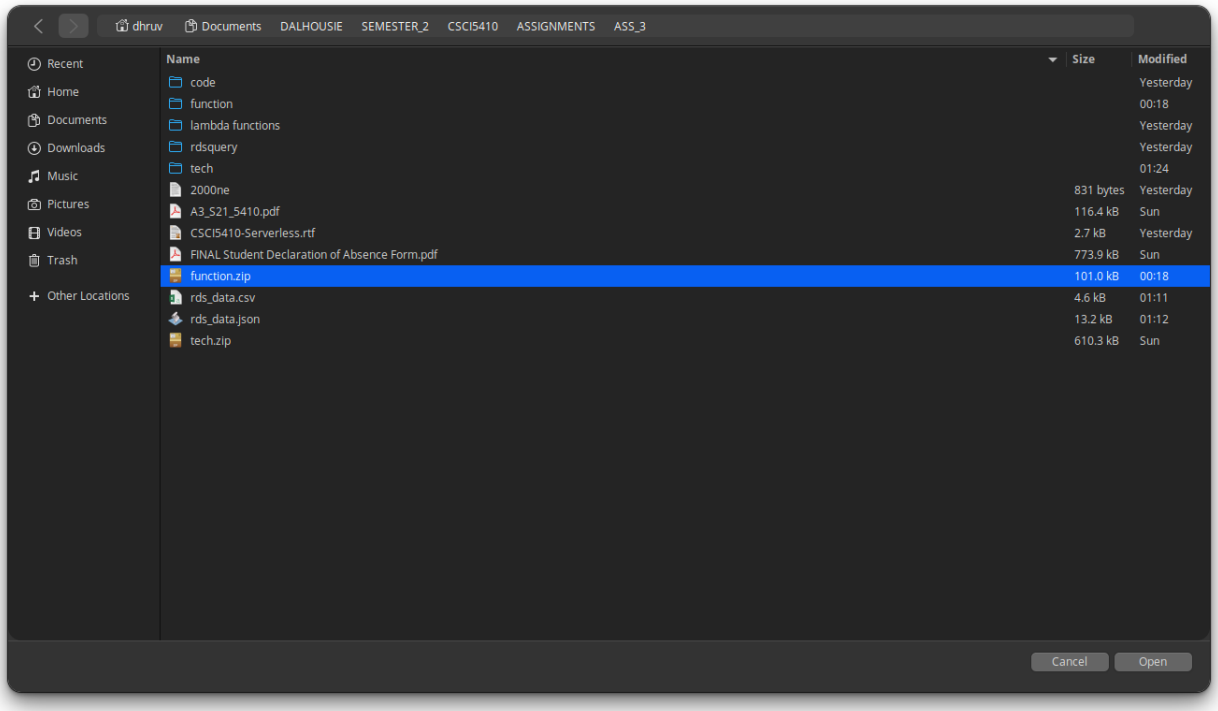
Create teble with workbench



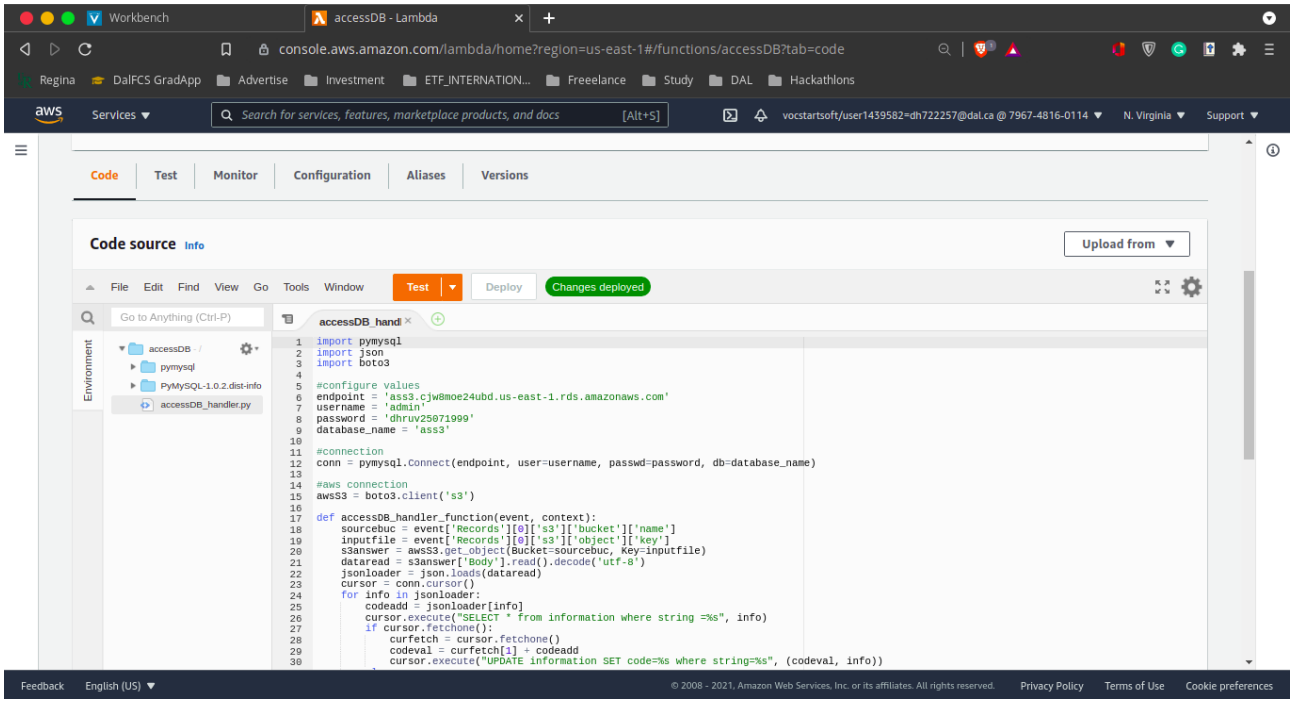
Another Lambda function upload by ZIP for pthon



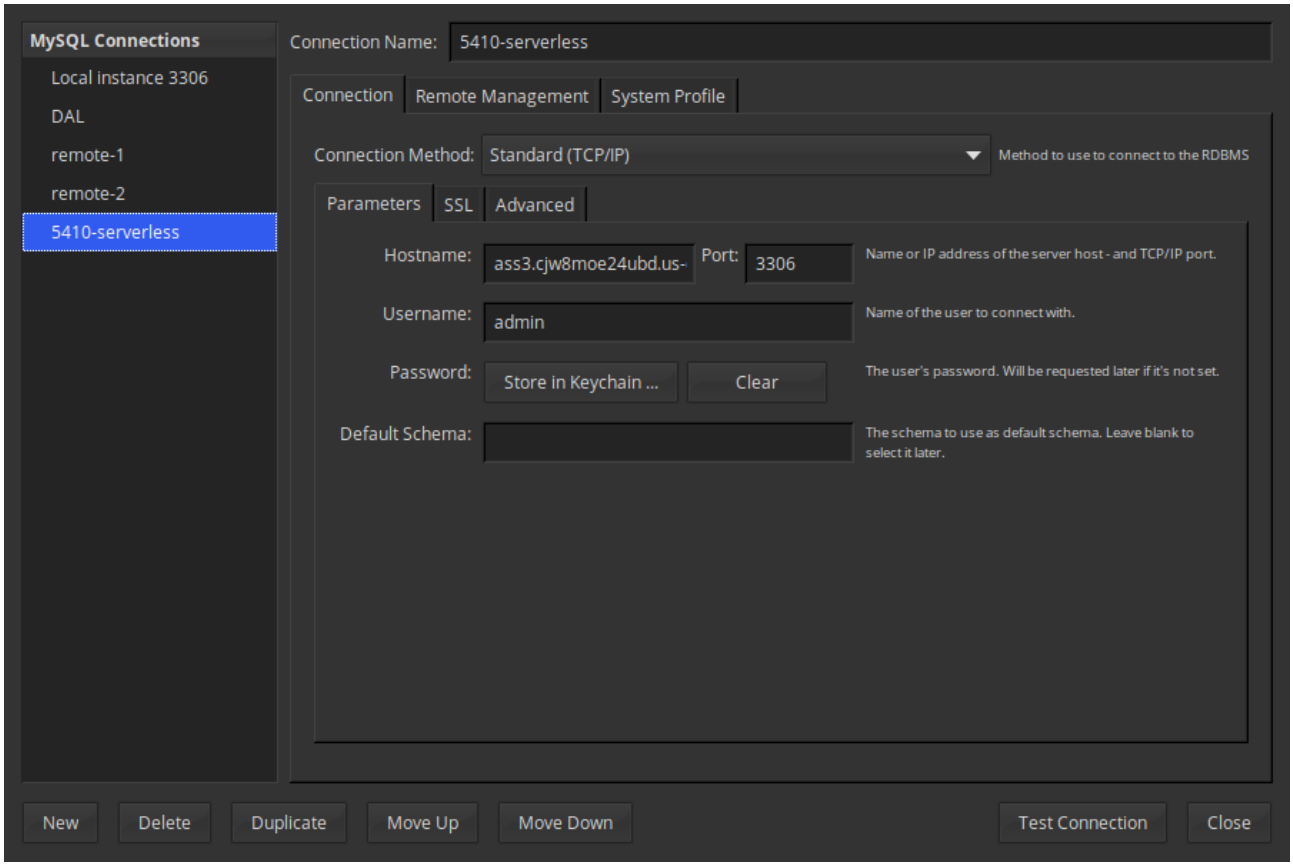
Taking the ZIP file and uploading the same

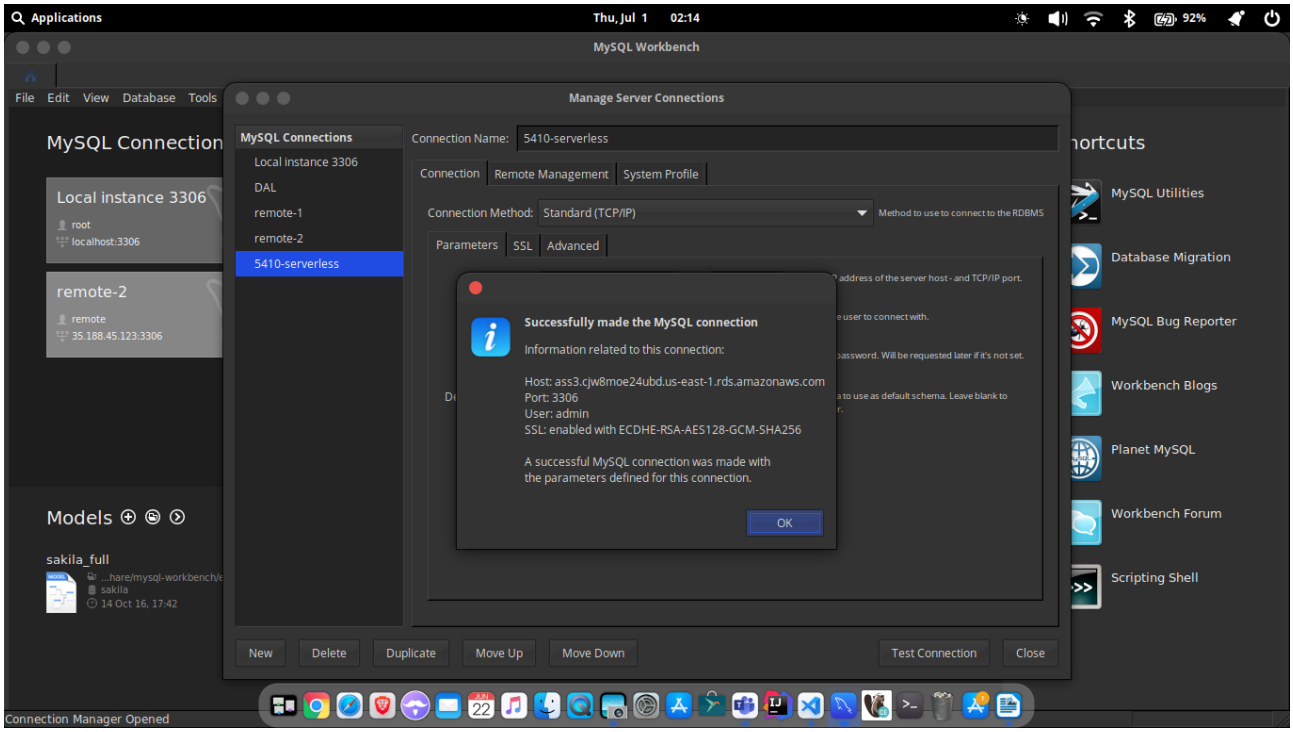


After Upload of all the files

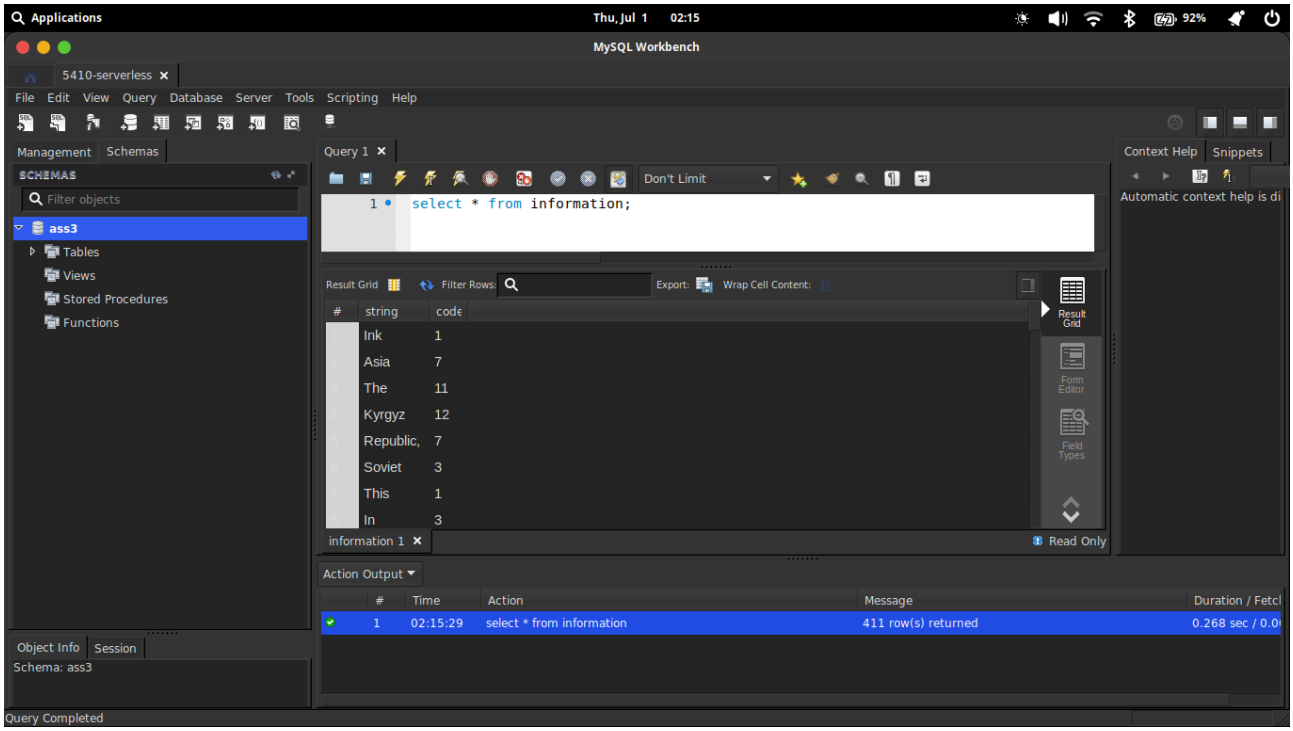


After whole setup and lambda triggering the insert or update method in SQL Now let’s check SQL Workbench.





After testing connect to db with ass-3 as schema



CODE FOR ALL PART

EXTRACT FEATURE

```
console.log('Starting the trigger for Extract feature lambda');

const aws = require('aws-sdk');

const s3 = new aws.S3({ apiVersion: '2006-03-01' });

/*
   “AWS Lambda function handler in Node.js - AWS Lambda,” Amazon.com, 2021. [Online].
   Available: https://docs.aws.amazon.com/lambda/latest/dg/nodejs-handler.html. [Accessed: 30-
Jun-2021]
*/
exports.handler = async (event, context) => {
   const bucket = event.Records[0].s3.bucket.name;
   const key = decodeURIComponent(event.Records[0].s3.object.key.replace(/\+/g, ' '));
   const buc_parameters = {
      Bucket: bucket,
      Key: key,
   };
   console.log(buc_parameters)
   extractFeatures(buc_parameters);
};


const extractFeatures = (buc_parameters) => {
   var uploadParams = {
   Bucket: 'tagsb00883311',
   Key: '',
   Body: ''
   }
   var counter = '{ \n "' + buc_parameters.Key + 'ne" : [ ';
   s3.getObject(buc_parameters, function (err, metadata) {
      // Using === because we need to match objects strictly
      if (err && err.code === 'NotFound') {
         console.log("The object on which we are working is missing")
      }
      else {
         var file_info = metadata.Body.toString('utf-8');
         // Split with each new line
         file_info = file_info.split("\n")
         for (var i = 0; i < file_info.length; i++) {
            // splitting by space to get each word
            var identical_word = file_info[i].split(' ');
            for (var k = 0; k < identical_word.length; k++) {
               // when null continue
               if (identical_word[k] === '') {
                  continue;
               }
```

```
                // change to null
                identical_word[k] = identical_word[k].replace(/[^a-zA-Z ]/g, "");
                // check for lower and upper case
                if (identical_word[k].charAt(0) === identical_word[k].charAt(0).toUpperCase()) {
                    // when null continue
                    if (identical_word[k] === '') {
                        continue;
                    }
                    var format_string = "\n\t{ "
                    format_string = format_string + "" + identical_word[k] + "' : 1} ,';
                    counter = counter + format_string;
                }
            }
        }
        // removing last element
        counter = counter.slice(0, -1);
        counter = counter + " \n]}";
        // as required in assignment
        var filename = buc_parameters.Key + "ne"
        uploadParams.Key = filename;
        uploadParams.Body = counter;
        s3.upload(uploadParams, function (s3Err, data) {
            if (s3Err) {
                console.log(s3Err);
            }
            console.log(`The uploading of file is done sucessfully at ${data.Location}`)
        });
        console.log(counter);
        var countjsonarray = JSON.parse(counter);
    }
  })
}
```

ACCESS DB NODE

```
console.log('Starting accessDb lambda trigger');

const aws = require('aws-sdk');

const s3 = new aws.S3({ apiVersion: '2006-03-01' });

/*
   “AWS Lambda function handler in Node.js - AWS Lambda,” Amazon.com, 2021. [Online].
   Available: https://docs.aws.amazon.com/lambda/latest/dg/nodejs-handler.html. [Accessed: 30-
Jun-2021]
**/
exports.handler = async (event, context) => {
   const bucket = event.Records[0].s3.bucket.name;
   const key = decodeURIComponent(event.Records[0].s3.object.key.replace(/\+/g, ' '));
   const buc_parameters = {
      Bucket: bucket,
      Key: key,
   };
   var fdata
   s3.getObject(buc_parameters, function (err, metadata) {
      if (err && err.code === 'NotFound') {
         console.log("The object on which we are working is missing")
      } else {
         fdata = metadata.Body.toString('utf-8');
      }
   })
   accessDB(fdata, buc_parameters.Key)
};


const accessDB = async (arrayodstrings, k1) => {
   var pool = mysql.createPool({
      host: "ass3.cjw8moe24ubd.us-east-1.rds.amazonaws.com",
      user: "admin",
      password: "dhruv25071999",
      port: "3306",
      database: "ass3"
   });


   console.log(arrayodstrings[k1]);
   for (var a = 0; a < arrayodstrings[k1].length; a++) {
      for (var key in arrayodstrings[k1][a]) {
         await addtoDB(key, pool);
      }
   }
pool.end();
}
```

```
function addtoDB(key, pool) {
    return new Promise(function (resolve) {
        var ch = "SELECT * FROM information where string= '" + key + "'";
        pool.query(ch, function (err, result) {
            if (result.length < 1) {
                var ins = "INSERT INTO information (string,code) VALUES ('" + key + "',1)";
                pool.query(ins, function (err, result) {
                    if (err) {
                        console.log(err);
                        }
                    resolve("Inserted completely");
                })
            } else {
                var up = "UPDATE information SET code = code + 1 WHERE string ='" + key + "'";
                pool.query(up, function (err, result) {
                    if (err) {
                        console.log(err);
                    }
                    resolve("updatation completed");
                })
            }
        })
    })
}
```

ACCESS DB PYTHON

```
import pymysql
import json
import boto3

#configure values
endpoint = 'ass3.cjw8moe24ubd.us-east-1.rds.amazonaws.com'
username = 'admin'
password = 'dhruv25071999'
database_name = 'ass3'

#connection
conn = pymysql.Connect(endpoint, user=username, passwd=password, db=database_name)

#aws connection
awsS3 = boto3.client('s3')

def accessDB_handler(event, context):
    sourcebuc = event['Records'][0]['s3']['bucket']['name']
    inputfile = event['Records'][0]['s3']['object']['key']
    s3answer = awsS3.get_object(Bucket=sourcebuc, Key=inputfile)
    dataread = s3answer['Body'].read().decode('utf-8')
    jsonloader = json.loads(dataread)
    cursor = conn.cursor()
    for info in jsonloader:
        codeadd = jsonloader[info]
        cursor.execute("SELECT * from information where string =%s", info)
        if cursor.fetchone():
            curfetch = cursor.fetchone()
            codeval = curfetch[1] + codeadd
            cursor.execute("UPDATE information SET code=%s where string=%s", (codeval, info))
        else:
            cursor.execute("INSERT INTO information values (%s,%s) ", (info, codeadd))
        conn.commit()
```

OUTPUT JSON FILE OF RDS

[{"string":"Ink", "code":1},
 {"string":"Asia", "code":7},
 {"string":"The", "code":11},
 {"string":"Kyrgyz", "code":12},
 {"string":"Republic,", "code":7},
 {"string":"Soviet", "code":3},
 {"string":"This", "code":1},
 {"string":"In", "code":3},
 {"string":"President,", "code":3},
 {"string":"Askar", "code":3},
 {"string":"Akaev,", "code":3},
 {"string":"Parliamentary", "code":3},
 {"string":"Presidential", "code":3},
 {"string":"US", "code":3},
 {"string":"Republic", "code":3},
 {"string":"German", "code":3},
 {"string":"Embassy,", "code":3},
 {"string":"Soros", "code":3},
 {"string":"Foundation", "code":3},
 {"string":"It", "code":3},
 {"string":"However,", "code":1},
 {"string":"At", "code":3},
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 {"string":"Likewise,", "code":3},
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