*CIS4010 Cloud Computing*
*Fall 2021*

# Assignment #2: Database in the Cloud

Given the following:

1. Table in DynamoDB called UN_country_codes (this is a shortlist of 40 countries)
2. Data to be made into tables with the following name convention: <your username>_<name of table>
    a. list of country areas (as of 2007): shortlist_area.csv
    b. list of country currencies and population numbers: shortlist_curpop.csv
    c. list of GDP per capita: shortlist_gdppc.csv
    d. list of official languages: shortlist_languages.csv
    e. list of capital cities: shortlist_capitals.csv
    f. additional data to add after the initial table loading

Do the following:

1. Design the tables so that you can update them by adding more countries but also more years of data, *e.g.* GDP per capita may only go to 2018 for some countries so we still have more years to add (and it starts in 1970 or 1990 so it is possible that prior data may exist for some countries).
2. Design the tables so that economic and non-economic data are not in the same table (these are database tables not spreadsheets).
3. Design and develop Python modules to
    a. create a table
    b. delete a table
    c. load records (data) into a table from a csv file, *i.e.* bulk load
    d. add individual record into a table
    e. delete individual record from a table
    f. dump/display all of the data in a specified table
    g. query module that will help you build the required reports (specified below)
4. Develop Python programs (using your modules) to
    a. A program that uses your functions/modules/library to create all necessary tables and load them with the data provided in the various CSV files.
    b. Add missing information to your existing tables (found in file Missing_Information.txt)
    c. Create a report for a specified country (Report A) or for all countries (Report B). See CourseLink for more information about the reports.

## Report A – Country Level Report

### Name of Country

*[Official Name: <Official Name of Country>]*

| |
|---|
| Area: xxxx sq km (<World Rank>) |
| Official/National Languages: xxxx<br>Capital City: <capital city> |

## Population

*Table of Population, Population Density, and their respective world ranking for that year, ordered by year:*

| Year | Population | Rank | Population Density (people/sq km) | Rank |
|---|---|---|---|---|
| 1970 | nnnnnnnnn | nn | ddd.dd | nn |
| 1971 | | | | |
| … | | | | |
| 2019 | | | | |

## Economics

Currency: <currency>

*Table of GDP per capita (GDPCC) <from earliest year to latest year> and rank within the world for that year*

| Year | GDPPC | Rank |
|---|---|---|
| 1970 | Ddddd | nn |
| 1971 | | |
| … | | |
| 2019 | | |

## Note

For all tables, if there is no value for a certain year:

- if that year has no years before it with values then do not display this row
- if there were previous years then leave a blank row (except for the year value)
- if there are no more non-empty rows after then do not display this row

## Report B – Global Report

# Global Report

**Year: <yyyy>**
*Number of Countries*: <number in tables>

**Table of Countries Ranked by Population** *(largest to smallest)*

| Country Name | Population | Rank |
|---|---|---|
| China | 827601394 | 1 |
| Brazil | 95113265 | 2 |
| … | | |
| Cook Islands | 21302 | 40 |

**Table of Countries Ranked by Area** *(largest to smallest)*

| Country Name | Area (sq km) | Rank |
|---|---|---|
| Canada | 9970610 | 1 |
| China | 9596961 | 2 |
| … | | |
| Cook Islands | 236 | 40 |

**Table of Countries Ranked by Density** *(largest to smallest)*

| Country Name | Density (people / sq km) | Rank |
|---|---|---|
| Barbados | 555.57 | 1 |
| Bangladesh | 446.07 | 2 |
| … | | |
| Botswana | 1.08 | 40 |

**GDP Per Capita for all Countries**
**1970's Table**

| Country Name | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|---|---|
| Albania | 1053 | 1058 | 1064 | 1069 | 1076 | 1082 | 1090 | 1096 | 1105 | 903 |
| Algeria | | | | | | | | | | |
| … | | | | | | | | | | |
| Costa Rica | | | | | | | | | | |

**1980's Table**

| Country Name | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|---|
| Albania | **798** | **809** | **817** | **810** | **784** | **783** | **787** | **761** | **769** | **903** |
| Algeria | | | | | | | | | | |
| … | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Costa Rica | | | | | | | | | | |

**…**

**2010's Table**

| Country Name | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Albania | 4046 | 4402 | 4228 | 4400 | 4567 | 3939 | 4109 | 4514 | 5254 | 5303 |
| Algeria | | | | | | | | | | |
| … | | | | | | | | | | |
| Costa Rica | | | | | | | | | | |