mod5_final_project

January 16, 2025

1 Introduction

Using this Python notebook we will:

1. Understand three Chicago datasets
2. Load the three datasets into three tables in a SQLIte database
3. Execute SQL queries to answer assignment questions

1.1 Understand the datasets

Three datasets are available on the city of Chicago's Data Portal:

1. Socioeconomic Indicators in Chicago
2. Chicago Public Schools
3. Chicago Crime Data

1.1.1 1. Socioeconomic Indicators in Chicago

This dataset contains a selection of six socioeconomic indicators of public health significance and a "hardship index," for each Chicago community area, for the years 2008 – 2012.

A detailed description of this dataset and the original dataset can be obtained from the Chicago Data Portal at:

https://data.cityofchicago.org/Health-Human-Services/Census-Data-Selected-socioeconomic-indicators-in-C/kn9c-c2s2

1.1.2 2. Chicago Public Schools

This dataset shows all school level performance data used to create CPS School Report Cards for the 2011-2012 school year. This dataset is provided by the city of Chicago's Data Portal.

A detailed description of this dataset and the original dataset can be obtained from the Chicago Data Portal at:

https://data.cityofchicago.org/Education/Chicago-Public-Schools-Progress-Report-Cards-2011-/9xs2-f89t

1.1.3 3. Chicago Crime Data

This dataset reflects reported incidents of crime (with the exception of murders where data exists for each victim) that occurred in the City of Chicago from 2001 to present, minus the most recent seven days.

A detailed description of this dataset and the original dataset can be obtained from the Chicago Data Portal at:

https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2

1.1.4 Downloading the datasets

In many cases the dataset to be analyzed is available as a .CSV (comma separated values) file, perhaps on the internet.

Use the links below to read the data files using the Pandas library.

- Chicago Census Data

https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/FinalModule_Coursera_V5/data/ChicagoCensusData.csv?utm_medium=Exinflu SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkDB0201ENSkillsNetwork20127838-2021-01-01

- Chicago Public Schools

https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/FinalModule_Coursera_V5/data/ChicagoPublicSchools.csv?utm_medium=Exin SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkDB0201ENSkillsNetwork20127838-2021-01-01

- Chicago Crime Data

https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/FinalModule_Coursera_V5/data/ChicagoCrimeData.csv?utm_medium=Exinflu SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkDB0201ENSkillsNetwork20127838-2021-01-01

Code to avoid prettytable default error.

[13]:
```
import csv, sqlite3

con = sqlite3.connect("FinalDB.db")
cur = con.cursor()
```

[14]:
```
!pip install pandas
!pip install ipython-sql prettytable
```

```
Requirement already satisfied: pandas in /opt/conda/lib/python3.12/site-packages
(2.2.3)
Requirement already satisfied: numpy>=1.26.0 in /opt/conda/lib/python3.12/site-
packages (from pandas) (2.2.1)
Requirement already satisfied: python-dateutil>=2.8.2 in
/opt/conda/lib/python3.12/site-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.12/site-
packages (from pandas) (2024.2)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.12/site-
packages (from pandas) (2024.2)
```

```
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.12/site-
packages (from python-dateutil>=2.8.2->pandas) (1.17.0)
Requirement already satisfied: ipython-sql in /opt/conda/lib/python3.12/site-
packages (0.5.0)
Requirement already satisfied: prettytable in /opt/conda/lib/python3.12/site-
packages (3.12.0)
Requirement already satisfied: ipython in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (8.31.0)
Requirement already satisfied: sqlalchemy>=2.0 in
/opt/conda/lib/python3.12/site-packages (from ipython-sql) (2.0.37)
Requirement already satisfied: sqlparse in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (0.5.3)
Requirement already satisfied: six in /opt/conda/lib/python3.12/site-packages
(from ipython-sql) (1.17.0)
Requirement already satisfied: ipython-genutils in
/opt/conda/lib/python3.12/site-packages (from ipython-sql) (0.2.0)
Requirement already satisfied: wcwidth in /opt/conda/lib/python3.12/site-
packages (from prettytable) (0.2.13)
Requirement already satisfied: greenlet!=0.4.17 in
/opt/conda/lib/python3.12/site-packages (from sqlalchemy>=2.0->ipython-sql)
(3.1.1)
Requirement already satisfied: typing-extensions>=4.6.0 in
/opt/conda/lib/python3.12/site-packages (from sqlalchemy>=2.0->ipython-sql)
(4.12.2)
Requirement already satisfied: decorator in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (5.1.1)
Requirement already satisfied: jedi>=0.16 in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (0.19.2)
Requirement already satisfied: matplotlib-inline in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (0.1.7)
Requirement already satisfied: pexpect>4.3 in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (4.9.0)
Requirement already satisfied: prompt_toolkit<3.1.0,>=3.0.41 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (3.0.48)
Requirement already satisfied: pygments>=2.4.0 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (2.19.1)
Requirement already satisfied: stack_data in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (0.6.3)
Requirement already satisfied: traitlets>=5.13.0 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (5.14.3)
Requirement already satisfied: parso<0.9.0,>=0.8.4 in
/opt/conda/lib/python3.12/site-packages (from jedi>=0.16->ipython->ipython-sql)
(0.8.4)
Requirement already satisfied: ptyprocess>=0.5 in
/opt/conda/lib/python3.12/site-packages (from pexpect>4.3->ipython->ipython-sql)
(0.7.0)
Requirement already satisfied: executing>=1.2.0 in
/opt/conda/lib/python3.12/site-packages (from stack_data->ipython->ipython-sql)
```

```
(2.1.0)
Requirement already satisfied: asttokens>=2.1.0 in
/opt/conda/lib/python3.12/site-packages (from stack_data->ipython->ipython-sql)
(3.0.0)
Requirement already satisfied: pure_eval in /opt/conda/lib/python3.12/site-
packages (from stack_data->ipython->ipython-sql) (0.2.3)
```

[15]:
```
!pip install ipython-sql prettytable

import prettytable

prettytable.DEFAULT = 'DEFAULT'
```

```
Requirement already satisfied: ipython-sql in /opt/conda/lib/python3.12/site-
packages (0.5.0)
Requirement already satisfied: prettytable in /opt/conda/lib/python3.12/site-
packages (3.12.0)
Requirement already satisfied: ipython in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (8.31.0)
Requirement already satisfied: sqlalchemy>=2.0 in
/opt/conda/lib/python3.12/site-packages (from ipython-sql) (2.0.37)
Requirement already satisfied: sqlparse in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (0.5.3)
Requirement already satisfied: six in /opt/conda/lib/python3.12/site-packages
(from ipython-sql) (1.17.0)
Requirement already satisfied: ipython-genutils in
/opt/conda/lib/python3.12/site-packages (from ipython-sql) (0.2.0)
Requirement already satisfied: wcwidth in /opt/conda/lib/python3.12/site-
packages (from prettytable) (0.2.13)
Requirement already satisfied: greenlet!=0.4.17 in
/opt/conda/lib/python3.12/site-packages (from sqlalchemy>=2.0->ipython-sql)
(3.1.1)
Requirement already satisfied: typing-extensions>=4.6.0 in
/opt/conda/lib/python3.12/site-packages (from sqlalchemy>=2.0->ipython-sql)
(4.12.2)
Requirement already satisfied: decorator in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (5.1.1)
Requirement already satisfied: jedi>=0.16 in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (0.19.2)
Requirement already satisfied: matplotlib-inline in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (0.1.7)
Requirement already satisfied: pexpect>4.3 in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (4.9.0)
Requirement already satisfied: prompt_toolkit<3.1.0,>=3.0.41 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (3.0.48)
Requirement already satisfied: pygments>=2.4.0 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (2.19.1)
Requirement already satisfied: stack_data in /opt/conda/lib/python3.12/site-
```

```
packages (from ipython->ipython-sql) (0.6.3)
Requirement already satisfied: traitlets>=5.13.0 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (5.14.3)
Requirement already satisfied: parso<0.9.0,>=0.8.4 in
/opt/conda/lib/python3.12/site-packages (from jedi>=0.16->ipython->ipython-sql)
(0.8.4)
Requirement already satisfied: ptyprocess>=0.5 in
/opt/conda/lib/python3.12/site-packages (from pexpect>4.3->ipython->ipython-sql)
(0.7.0)
Requirement already satisfied: executing>=1.2.0 in
/opt/conda/lib/python3.12/site-packages (from stack_data->ipython->ipython-sql)
(2.1.0)
Requirement already satisfied: asttokens>=2.1.0 in
/opt/conda/lib/python3.12/site-packages (from stack_data->ipython->ipython-sql)
(3.0.0)
Requirement already satisfied: pure_eval in /opt/conda/lib/python3.12/site-
packages (from stack_data->ipython->ipython-sql) (0.2.3)
```

1.1.5 Store the datasets in database tables

To analyze the data using SQL, it first needs to be loaded into SQLite DB. We will create three tables in as under:

1. **CENSUS_DATA**
2. **CHICAGO_PUBLIC_SCHOOLS**
3. **CHICAGO_CRIME_DATA**

Load the `pandas` and `sqlite3` libraries and establish a connection to `FinalDB.db`

Load the SQL magic module

[16]:
```
!pip install ipython-sql
%load_ext sql
```

```
Requirement already satisfied: ipython-sql in /opt/conda/lib/python3.12/site-
packages (0.5.0)
Requirement already satisfied: prettytable in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (3.12.0)
Requirement already satisfied: ipython in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (8.31.0)
Requirement already satisfied: sqlalchemy>=2.0 in
/opt/conda/lib/python3.12/site-packages (from ipython-sql) (2.0.37)
Requirement already satisfied: sqlparse in /opt/conda/lib/python3.12/site-
packages (from ipython-sql) (0.5.3)
Requirement already satisfied: six in /opt/conda/lib/python3.12/site-packages
(from ipython-sql) (1.17.0)
Requirement already satisfied: ipython-genutils in
/opt/conda/lib/python3.12/site-packages (from ipython-sql) (0.2.0)
Requirement already satisfied: greenlet!=0.4.17 in
/opt/conda/lib/python3.12/site-packages (from sqlalchemy>=2.0->ipython-sql)
```

```
(3.1.1)
Requirement already satisfied: typing-extensions>=4.6.0 in
/opt/conda/lib/python3.12/site-packages (from sqlalchemy>=2.0->ipython-sql)
(4.12.2)
Requirement already satisfied: decorator in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (5.1.1)
Requirement already satisfied: jedi>=0.16 in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (0.19.2)
Requirement already satisfied: matplotlib-inline in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (0.1.7)
Requirement already satisfied: pexpect>4.3 in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (4.9.0)
Requirement already satisfied: prompt_toolkit<3.1.0,>=3.0.41 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (3.0.48)
Requirement already satisfied: pygments>=2.4.0 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (2.19.1)
Requirement already satisfied: stack_data in /opt/conda/lib/python3.12/site-
packages (from ipython->ipython-sql) (0.6.3)
Requirement already satisfied: traitlets>=5.13.0 in
/opt/conda/lib/python3.12/site-packages (from ipython->ipython-sql) (5.14.3)
Requirement already satisfied: wcwidth in /opt/conda/lib/python3.12/site-
packages (from prettytable->ipython-sql) (0.2.13)
Requirement already satisfied: parso<0.9.0,>=0.8.4 in
/opt/conda/lib/python3.12/site-packages (from jedi>=0.16->ipython->ipython-sql)
(0.8.4)
Requirement already satisfied: ptyprocess>=0.5 in
/opt/conda/lib/python3.12/site-packages (from pexpect>4.3->ipython->ipython-sql)
(0.7.0)
Requirement already satisfied: executing>=1.2.0 in
/opt/conda/lib/python3.12/site-packages (from stack_data->ipython->ipython-sql)
(2.1.0)
Requirement already satisfied: asttokens>=2.1.0 in
/opt/conda/lib/python3.12/site-packages (from stack_data->ipython->ipython-sql)
(3.0.0)
Requirement already satisfied: pure_eval in /opt/conda/lib/python3.12/site-
packages (from stack_data->ipython->ipython-sql) (0.2.3)
The sql extension is already loaded. To reload it, use:
  %reload_ext sql
```

Use `Pandas` to load the data available in the links above to dataframes. Use these dataframes to load data on to the database `FinalDB.db` as required tables.

[17]:
```
import pandas as pd
df1 = pd.read_csv("https://cf-courses-data.s3.us.cloud-object-storage.appdomain.
 ↪cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/
 ↪FinalModule_Coursera_V5/data/ChicagoCensusData.csv?
 ↪utm_medium=Exinfluencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_
df1.to_sql('ChicagoCensusData', con, if_exists='replace',
```

```
index=False, method='multi')
```

[17]:
```
78
```

[18]:
```
import pandas as pd
df2 = pd.read_csv("https://cf-courses-data.s3.us.cloud-object-storage.appdomain.
 ↪cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/
 ↪FinalModule_Coursera_V5/data/ChicagoPublicSchools.csv")
df2.to_sql('ChicagoPublicSchools', con, if_exists='replace',
index=False, method='multi')
```

[18]:
```
566
```

[19]:
```
import pandas as pd
df3 = pd.read_csv("https://cf-courses-data.s3.us.cloud-object-storage.appdomain.
 ↪cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/
 ↪FinalModule_Coursera_V5/data/ChicagoCrimeData.csv")
df3.to_sql('ChicagoCrimeData', con, if_exists='replace',
index=False, method='multi')
```

[19]:
```
533
```

Establish a connection between SQL magic module and the database `FinalDB.db`

[20]:
```
%sql sqlite:///FinalDB.db
```

Attributes of ChicagoCensusData

[21]:
```
%sql SELECT name,type,length(type) FROM PRAGMA_table_info('ChicagoCensusData');
```

```
 * sqlite:///FinalDB.db
Done.
```

[21]:
```
[('COMMUNITY_AREA_NUMBER', 'REAL', 4),
 ('COMMUNITY_AREA_NAME', 'TEXT', 4),
 ('PERCENT_OF_HOUSING_CROWDED', 'REAL', 4),
 ('PERCENT_HOUSEHOLDS_BELOW_POVERTY', 'REAL', 4),
 ('PERCENT_AGED_16__UNEMPLOYED', 'REAL', 4),
 ('PERCENT_AGED_25__WITHOUT_HIGH_SCHOOL_DIPLOMA', 'REAL', 4),
 ('PERCENT_AGED_UNDER_18_OR_OVER_64', 'REAL', 4),
 ('PER_CAPITA_INCOME', 'INTEGER', 7),
 ('HARDSHIP_INDEX', 'REAL', 4)]
```

Attributes of ChicagoPublicSchools

[35]:
```
%sql SELECT name,type,length(type) FROM␣
 ↪PRAGMA_table_info('ChicagoPublicSchools');
```

```
 * sqlite:///FinalDB.db
Done.
```

[35]:
```
[('School_ID', 'INTEGER', 7),
 ('NAME_OF_SCHOOL', 'TEXT', 4),
 ('Elementary, Middle, or High School', 'TEXT', 4),
 ('Street_Address', 'TEXT', 4),
 ('City', 'TEXT', 4),
 ('State', 'TEXT', 4),
 ('ZIP_Code', 'INTEGER', 7),
 ('Phone_Number', 'TEXT', 4),
 ('Link', 'TEXT', 4),
 ('Network_Manager', 'TEXT', 4),
 ('Collaborative_Name', 'TEXT', 4),
 ('Adequate_Yearly_Progress_Made_', 'TEXT', 4),
 ('Track_Schedule', 'TEXT', 4),
 ('CPS_Performance_Policy_Status', 'TEXT', 4),
 ('CPS_Performance_Policy_Level', 'TEXT', 4),
 ('HEALTHY_SCHOOL_CERTIFIED', 'TEXT', 4),
 ('Safety_Icon', 'TEXT', 4),
 ('SAFETY_SCORE', 'REAL', 4),
 ('Family_Involvement_Icon', 'TEXT', 4),
 ('Family_Involvement_Score', 'TEXT', 4),
 ('Environment_Icon', 'TEXT', 4),
 ('Environment_Score', 'REAL', 4),
 ('Instruction_Icon', 'TEXT', 4),
 ('Instruction_Score', 'REAL', 4),
 ('Leaders_Icon', 'TEXT', 4),
 ('Leaders_Score', 'TEXT', 4),
 ('Teachers_Icon', 'TEXT', 4),
 ('Teachers_Score', 'TEXT', 4),
 ('Parent_Engagement_Icon', 'TEXT', 4),
 ('Parent_Engagement_Score', 'TEXT', 4),
 ('Parent_Environment_Icon', 'TEXT', 4),
 ('Parent_Environment_Score', 'TEXT', 4),
 ('AVERAGE_STUDENT_ATTENDANCE', 'TEXT', 4),
 ('Rate_of_Misconducts__per_100_students_', 'REAL', 4),
 ('Average_Teacher_Attendance', 'TEXT', 4),
 ('Individualized_Education_Program_Compliance_Rate', 'TEXT', 4),
 ('Pk_2_Literacy__', 'TEXT', 4),
 ('Pk_2_Math__', 'TEXT', 4),
 ('Gr3_5_Grade_Level_Math__', 'TEXT', 4),
 ('Gr3_5_Grade_Level_Read__', 'TEXT', 4),
 ('Gr3_5_Keep_Pace_Read__', 'TEXT', 4),
 ('Gr3_5_Keep_Pace_Math__', 'TEXT', 4),
 ('Gr6_8_Grade_Level_Math__', 'TEXT', 4),
 ('Gr6_8_Grade_Level_Read__', 'TEXT', 4),
 ('Gr6_8_Keep_Pace_Math_', 'TEXT', 4),
 ('Gr6_8_Keep_Pace_Read__', 'TEXT', 4),
 ('Gr_8_Explore_Math__', 'TEXT', 4),
```

```
 ('Gr_8_Explore_Read__', 'TEXT', 4),
 ('ISAT_Exceeding_Math__', 'REAL', 4),
 ('ISAT_Exceeding_Reading__', 'REAL', 4),
 ('ISAT_Value_Add_Math', 'REAL', 4),
 ('ISAT_Value_Add_Read', 'REAL', 4),
 ('ISAT_Value_Add_Color_Math', 'TEXT', 4),
 ('ISAT_Value_Add_Color_Read', 'TEXT', 4),
 ('Students_Taking__Algebra__', 'TEXT', 4),
 ('Students_Passing__Algebra__', 'TEXT', 4),
 ('9th Grade EXPLORE (2009)', 'TEXT', 4),
 ('9th Grade EXPLORE (2010)', 'TEXT', 4),
 ('10th Grade PLAN (2009)', 'TEXT', 4),
 ('10th Grade PLAN (2010)', 'TEXT', 4),
 ('Net_Change_EXPLORE_and_PLAN', 'TEXT', 4),
 ('11th Grade Average ACT (2011)', 'TEXT', 4),
 ('Net_Change_PLAN_and_ACT', 'TEXT', 4),
 ('College_Eligibility__', 'TEXT', 4),
 ('Graduation_Rate__', 'TEXT', 4),
 ('College_Enrollment_Rate__', 'TEXT', 4),
 ('COLLEGE_ENROLLMENT', 'INTEGER', 7),
 ('General_Services_Route', 'INTEGER', 7),
 ('Freshman_on_Track_Rate__', 'TEXT', 4),
 ('X_COORDINATE', 'REAL', 4),
 ('Y_COORDINATE', 'REAL', 4),
 ('Latitude', 'REAL', 4),
 ('Longitude', 'REAL', 4),
 ('COMMUNITY_AREA_NUMBER', 'INTEGER', 7),
 ('COMMUNITY_AREA_NAME', 'TEXT', 4),
 ('Ward', 'INTEGER', 7),
 ('Police_District', 'INTEGER', 7),
 ('Location', 'TEXT', 4)]
```

Attributes of ChicagoCrimeData

[36]:
```
%sql SELECT name,type,length(type) FROM PRAGMA_table_info('ChicagoCrimeData');
```

```
 * sqlite:///FinalDB.db
Done.
```

[36]:
```
[('ID', 'INTEGER', 7),
 ('CASE_NUMBER', 'TEXT', 4),
 ('DATE', 'TEXT', 4),
 ('BLOCK', 'TEXT', 4),
 ('IUCR', 'TEXT', 4),
 ('PRIMARY_TYPE', 'TEXT', 4),
 ('DESCRIPTION', 'TEXT', 4),
 ('LOCATION_DESCRIPTION', 'TEXT', 4),
 ('ARREST', 'INTEGER', 7),
```

```
 ('DOMESTIC', 'INTEGER', 7),
 ('BEAT', 'INTEGER', 7),
 ('DISTRICT', 'INTEGER', 7),
 ('WARD', 'REAL', 4),
 ('COMMUNITY_AREA_NUMBER', 'REAL', 4),
 ('FBICODE', 'TEXT', 4),
 ('X_COORDINATE', 'REAL', 4),
 ('Y_COORDINATE', 'REAL', 4),
 ('YEAR', 'INTEGER', 7),
 ('LATITUDE', 'REAL', 4),
 ('LONGITUDE', 'REAL', 4),
 ('LOCATION', 'TEXT', 4)]
```

[37]:
```
%sql select count(*) from ChicagoCrimeData
```

```
 * sqlite:///FinalDB.db
Done.
```

[37]:
```
[(533,)]
```

1.1.6 Problem 2

List community area names and numbers with per capita income less than 11000.

[22]:
```
%sql SELECT COMMUNITY_AREA_NUMBER, COMMUNITY_AREA_NAME FROM ChicagoCensusData␣
 ↪WHERE PER_CAPITA_INCOME<11000
```

```
 * sqlite:///FinalDB.db
Done.
```

[22]:
```
[(26.0, 'West Garfield Park'),
 (30.0, 'South Lawndale'),
 (37.0, 'Fuller Park'),
 (54.0, 'Riverdale')]
```

1.1.7 Problem 3

List all case numbers for crimes involving minors?(children are not considered minors for the purposes of crime analysis)

[33]:
```
%sql SELECT CASE_NUMBER \
FROM ChicagoCrimeData \
    WHERE DESCRIPTION LIKE "%MINOR%"
```

```
 * sqlite:///FinalDB.db
Done.
```

[33]:
```
[('HL266884',), ('HK238408',)]
```

1.1.8 Problem 4

List all kidnapping crimes involving a child?

[48]:
```
%sql SELECT * from ChicagoCrimeData where primary_type='KIDNAPPING'
```

```
 * sqlite:///FinalDB.db
Done.
```

[48]:
```
[(5276766, 'HN144152', '2007-01-26', '050XX W VAN BUREN ST', '1792',
'KIDNAPPING', 'CHILD ABDUCTION/STRANGER', 'STREET', 0, 0, 1533, 15, 29.0, 25.0,
'20', 1143050.0, 1897546.0, 2007, 41.87490841, -87.75024931, '(41.874908413,
-87.750249307)')]
```

1.1.9 Problem 5

List the kind of crimes that were recorded at schools. (No repetitions)

[26]:
```
%sql SELECT distinct(primary_type) from ChicagoCrimeData where␣
↪location_description like "SCHOOL%"
```

```
 * sqlite:///FinalDB.db
Done.
```

[26]:
```
[('BATTERY',),
 ('CRIMINAL DAMAGE',),
 ('NARCOTICS',),
 ('ASSAULT',),
 ('CRIMINAL TRESPASS',),
 ('PUBLIC PEACE VIOLATION',)]
```

1.1.10 Problem 6

List the type of schools along with the average safety score for each type.

[61]:
```
%sql SELECT "Elementary, Middle, or High School", avg(SAFETY_SCORE) FROM␣
↪ChicagoPublicSchools group by("Elementary, Middle, or High School")
```

```
 * sqlite:///FinalDB.db
Done.
```

[61]:
```
[('ES', 49.52038369304557), ('HS', 49.62352941176471), ('MS', 48.0)]
```

1.1.11 Problem 7

List 5 community areas with highest % of households below poverty line

[63]:
```
%sql select COMMUNITY_AREA_NAME, PERCENT_HOUSEHOLDS_BELOW_POVERTY from␣
↪ChicagoCensusData order by PERCENT_HOUSEHOLDS_BELOW_POVERTY desc limit 5
```

```
 * sqlite:///FinalDB.db
Done.
```

[63]:
```
[('Riverdale', 56.5),
 ('Fuller Park', 51.2),
 ('Englewood', 46.6),
 ('North Lawndale', 43.1),
```

```
('East Garfield Park', 42.4)]
```

1.1.12 Problem 8

Which community area is most crime prone? Display the coumminty area number only.

[79]:
```
%sql select COMMUNITY_AREA_NUMBER, COUNT(*) AS CRIMES from ChicagoCrimeData␣
↪WHERE COMMUNITY_AREA_NUMBER!='None' GROUP BY COMMUNITY_AREA_NUMBER ORDER BY␣
↪CRIMES DESC LIMIT 1
```

```
 * sqlite:///FinalDB.db
Done.
```

[79]:
```
[(25.0, 43)]
```

Double-click **here** for a hint

1.1.13 Problem 9

Use a sub-query to find the name of the community area with highest hardship index

[77]:
```
%sql SELECT COMMUNITY_AREA_NAME FROM ChicagoCensusData WHERE␣
↪HARDSHIP_INDEX=(SELECT MAX(HARDSHIP_INDEX) FROM ChicagoCensusData)
```

```
 * sqlite:///FinalDB.db
Done.
```

[77]:
```
[('Riverdale',)]
```

1.1.14 Problem 10

Use a sub-query to determine the Community Area Name with most number of crimes?

[82]:
```
%sql SELECT CCD.COMMUNITY_AREA_NUMBER, CCD.COMMUNITY_AREA_NAME, COUNT(*) AS␣
↪CRIMES \
   FROM ChicagoCrimeData AS CCrD, ChicagoCensusData AS CCD \
WHERE CCrD.COMMUNITY_AREA_NUMBER!='None' AND CCrD.COMMUNITY_AREA_NUMBER= CCD.
↪COMMUNITY_AREA_NUMBER \
GROUP BY CCrD.COMMUNITY_AREA_NUMBER \
ORDER BY CRIMES DESC \
LIMIT 1
```

```
 * sqlite:///FinalDB.db
Done.
```

[82]:
```
[(25.0, 'Austin', 43)]
```

[81]:
```
%sql SELECT COMMUNITY_AREA_NAME FROM ChicagoCensusData WHERE␣
↪COMMUNITY_AREA_NUMBER=(SELECT COMMUNITY_AREA_NUMBER AS CRIMES from␣
↪ChicagoCrimeData WHERE COMMUNITY_AREA_NUMBER!='None' GROUP BY␣
↪COMMUNITY_AREA_NUMBER ORDER BY COUNT(*) DESC LIMIT 1)
```

```
 * sqlite:///FinalDB.db
Done.
```

[81]:
```
[('Austin',)]
```

1.2 Author(s) for Problem Questions

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