CPSC 304 Project Cover Page

Milestone #: 4

Date: November 30, 2023

Group Number: 69

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

Group 69 Milestone 4 PDF

a. A short description of the final project, and what it accomplished.

Our project is a Canadian National census database, the database contains census facts on both individuals and households. It is a comprehensive database for local and national governments to access vital information for budget allocation in different areas. The final project involved the creation of a well-structured Canadian National Census database. This database was designed to effectively capture, store, and analyze detailed demographic and occupational information of Canadian citizens and residents.

Key accomplishments of the project include:

- Our database organization facilitated easier data entry, retrieval, and management.
- The project ensured high data integrity and accuracy. This reduced data redundancy and inconsistencies, leading to more reliable census information.
- The database design offered scalability and flexibility, allowing for future expansions and updates as required by changing census parameters or additional data requirements.

Overall, the project played a crucial role in modernizing and enhancing the efficiency of Canada's national census process, which happens once every 5 years. Our database should record accurate and up-to-date population data.

b. A description of how your final schema differed from the schema you turned in.

i. If the final schema differed, explain why. Note that turning in a final schema that's different from what you planned is fine, we just want to know what changed and why.

We figured that we did not need too many attributes thus we cut down 8 attributes that we initially had. Cutting down the number of attributes mainly served the purpose of making implementation easier for us.

SIN → Individual Name, Gender, Age, Income, Ethnicity, Birthplace, Level Name, Status ID, Address, Postal Code, Skill_ID
SIN, Authorization ID → Occupation ID
Occupation ID → Occupation Name, Occupation Average Income
Level Name→ Education Average Income
Status ID → Status Name, Average Age of Marriage

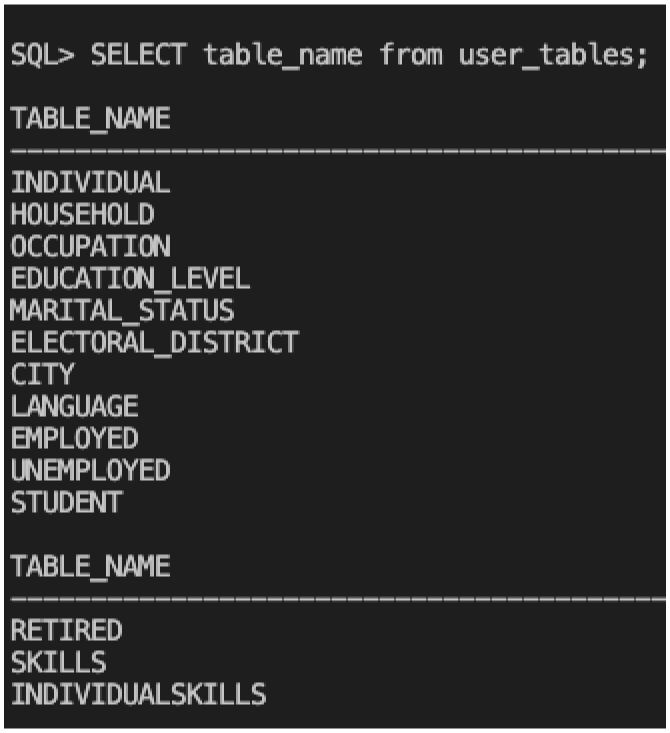
Address, Postal Code → Number of Members, ED Name, City Name, Province Name, Language Name
ED Name → MP, MP Party
City Name, Province Name → Population

The following highlighted attributes in yellow were taken out. Our rationale for excluding each attribute was mostly arbitrary. However information such as “occupation average income”, “education average income”, “average age of marriage”, “MP”, “MP party” and “population” are mostly expendable. “Ethnicity” and “birthplace” are not commonly recorded on the Canadian Census. Throughout our implementation, we also added the table Individual Skills to our project, hence we have the new attribute Skill_ID.

c. A copy of the schema and screenshots that show what data is present in each relation after the SQL script from item #2 is run.

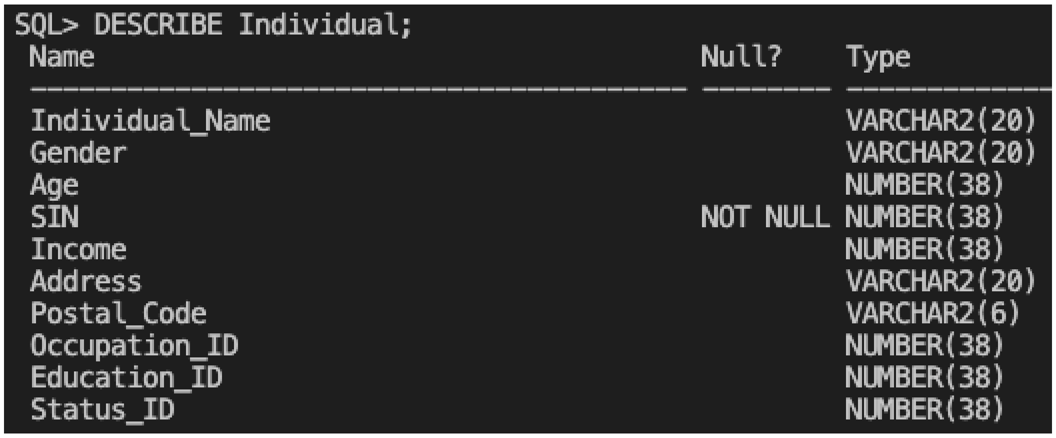
i. Do not use DDL statements for this deliverable. List the relational schemas with the primary key attributes underlined and foreign keys bolded. For example, Student(sid, name, dob).
ii. You can complete this deliverable with screenshots from SQL Plus or create a representation of your relational instances through a spreadsheet program. No matter what you use, be sure to clearly label which relation a given instance refers to.

- **Individual** (Individual Name, Gender, Age, SIN, Income, **Address**, **Postal Code**, **Occupation ID**, **Education ID**, **Status ID**)
- **Household** (Address, Postal Code, Number of Members, **ED Name**, **City Name**, **Province Name**, **Language Name**) (ED Name, City Name, Province Name cannot be null)
- **Occupation** (Occupation ID, Occupation Name)
- **Education Level** (Education ID, Level Name)
- **Marital Status** (Status ID, Status Name)
- **Electoral District** (ED Name)
- **City** (City Name, Province Name)
- **Language** (Language Name, **Address**, **Postal Code**)
- **Employed** (Employer, Job Title, Occupation ID, Occupation Name)
- **Unemployed** (Seeking Employment, Occupation ID, Occupation Name)
- **Student** (Institution Name, Level of Study, Occupation ID, Occupation Name)
- **Retired** (Age at Retirement, Occupation ID, Occupation Name)
- **Individual Skills (**Skill_ID, **SIN)**



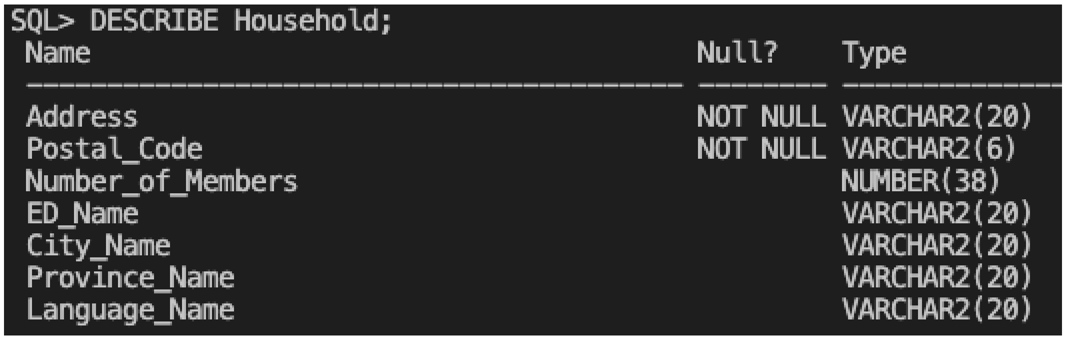
```
SQL> SELECT table_name from user_tables;

TABLE_NAME
--------------------------------------------
INDIVIDUAL
HOUSEHOLD
OCCUPATION
EDUCATION_LEVEL
MARITAL_STATUS
ELECTORAL_DISTRICT
CITY
LANGUAGE
EMPLOYED
UNEMPLOYED
STUDENT

TABLE_NAME
--------------------------------------------
RETIRED
SKILLS
INDIVIDUALSKILLS
```

Fig. 1 Screenshot of all the Tables



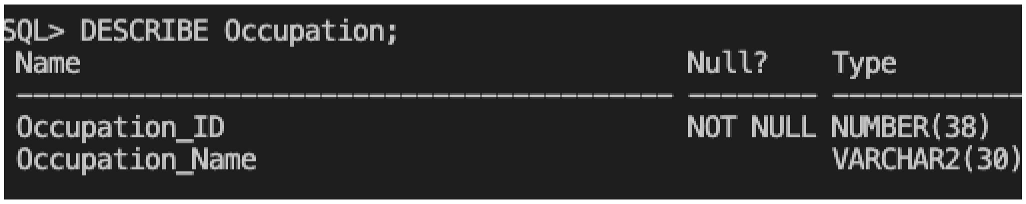
```
SQL> DESCRIBE Individual;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Individual_Name                                    VARCHAR2(20)
 Gender                                             VARCHAR2(20)
 Age                                                NUMBER(38)
 SIN                                       NOT NULL NUMBER(38)
 Income                                             NUMBER(38)
 Address                                            VARCHAR2(20)
 Postal_Code                                        VARCHAR2(6)
 Occupation_ID                                      NUMBER(38)
 Education_ID                                       NUMBER(38)
 Status_ID                                          NUMBER(38)
```

Fig. 2 Screenshot of Individual



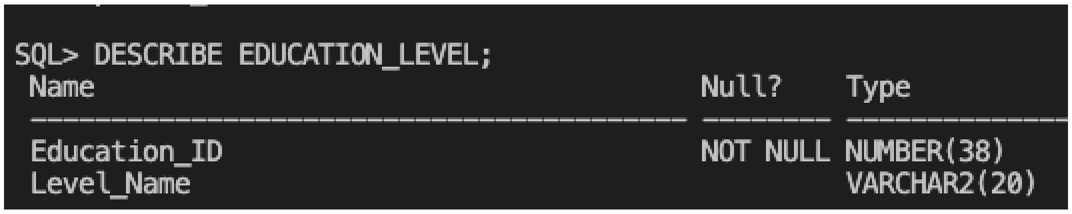
```
SQL> DESCRIBE Household;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Address                                   NOT NULL VARCHAR2(20)
 Postal_Code                               NOT NULL VARCHAR2(6)
 Number_of_Members                                  NUMBER(38)
 ED_Name                                            VARCHAR2(20)
 City_Name                                          VARCHAR2(20)
 Province_Name                                      VARCHAR2(20)
 Language_Name                                      VARCHAR2(20)
```

Fig. 3 Screenshot of Household



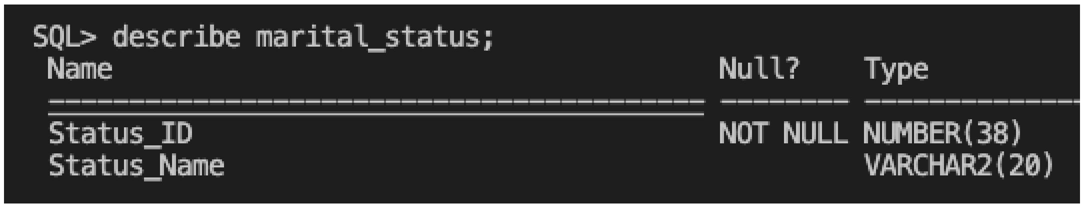
```
SQL> DESCRIBE Occupation;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Occupation_ID                             NOT NULL NUMBER(38)
 Occupation_Name                                    VARCHAR2(30)
```

Fig. 4 Screenshot of Occupation



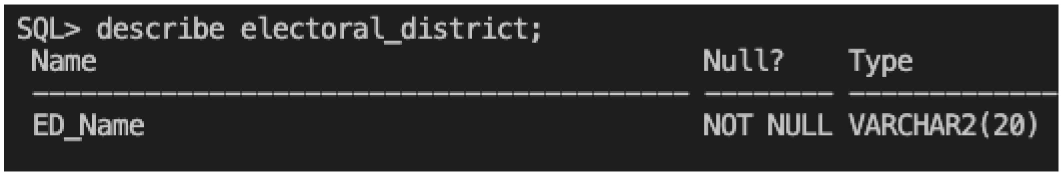
```
SQL> DESCRIBE EDUCATION_LEVEL;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Education_ID                              NOT NULL NUMBER(38)
 Level_Name                                         VARCHAR2(20)
```

Fig. 5 Screenshot of Education Level



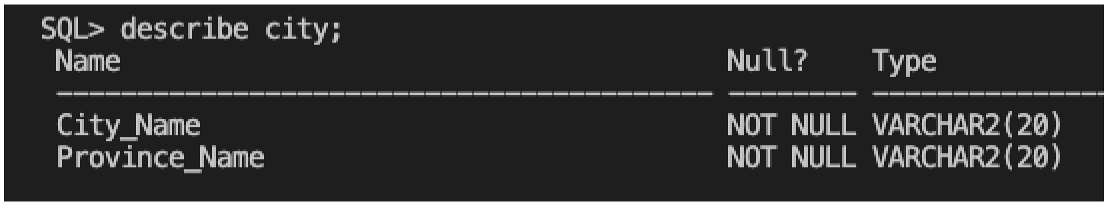
```
SQL> describe marital_status;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Status_ID                                 NOT NULL NUMBER(38)
 Status_Name                                        VARCHAR2(20)
```

Fig. 6 Screenshot of Marital Status



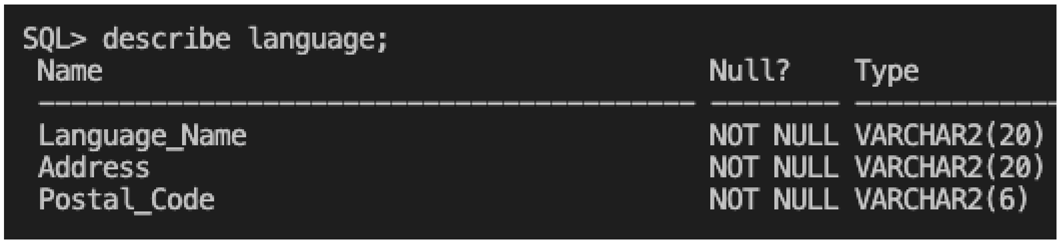
```
SQL> describe electoral_district;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 ED_Name                                   NOT NULL VARCHAR2(20)
```

Fig. 7 Screenshot of Electoral district



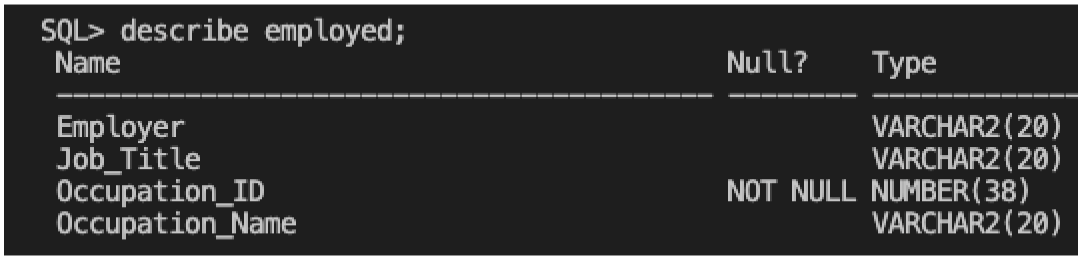
```
SQL> describe city;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 City_Name                                 NOT NULL VARCHAR2(20)
 Province_Name                             NOT NULL VARCHAR2(20)
```

Fig. 8 Screenshot of City



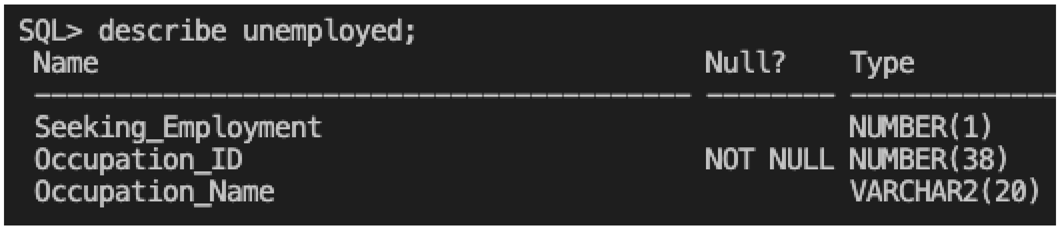
```
SQL> describe language;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Language_Name                             NOT NULL VARCHAR2(20)
 Address                                   NOT NULL VARCHAR2(20)
 Postal_Code                               NOT NULL VARCHAR2(6)
```

Fig. 9 Screenshot of Language



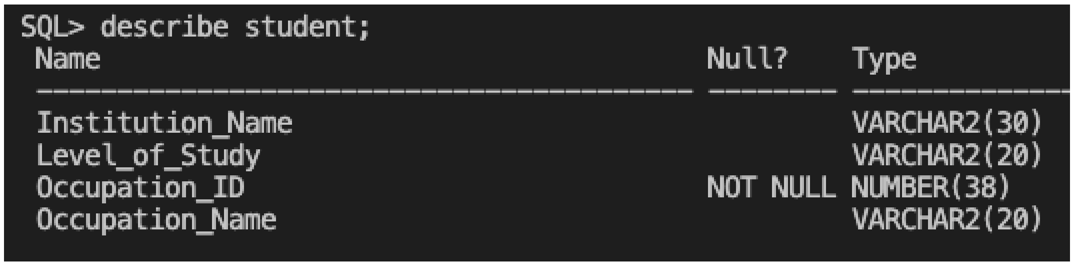
```
SQL> describe employed;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Employer                                           VARCHAR2(20)
 Job_Title                                          VARCHAR2(20)
 Occupation_ID                             NOT NULL NUMBER(38)
 Occupation_Name                                    VARCHAR2(20)
```

Fig. 10 Screenshot of Employed



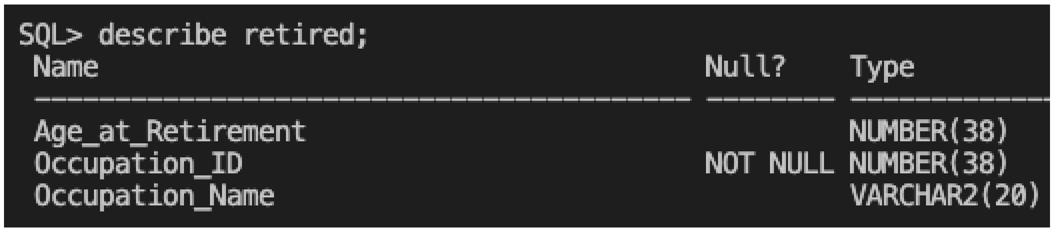
```
SQL> describe unemployed;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Seeking_Employment                                 NUMBER(1)
 Occupation_ID                             NOT NULL NUMBER(38)
 Occupation_Name                                    VARCHAR2(20)
```

Fig. 11 Screenshot of Unemployed



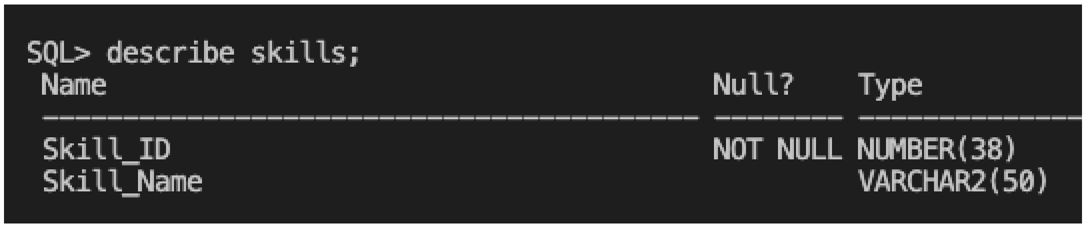
```
SQL> describe student;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Institution_Name                                   VARCHAR2(30)
 Level_of_Study                                     VARCHAR2(20)
 Occupation_ID                             NOT NULL NUMBER(38)
 Occupation_Name                                    VARCHAR2(20)
```

Fig. 12 Screenshot of Student



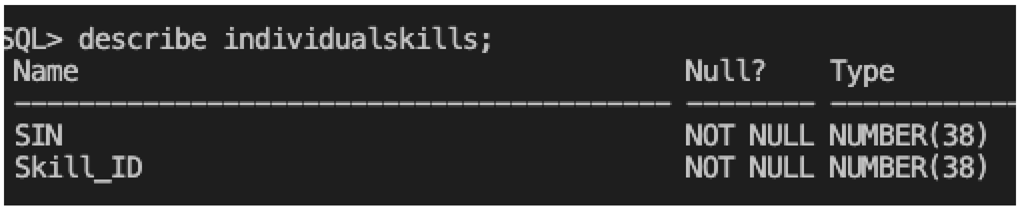
```
SQL> describe retired;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Age_at_Retirement                                  NUMBER(38)
 Occupation_ID                             NOT NULL NUMBER(38)
 Occupation_Name                                    VARCHAR2(20)
```

Fig. 13 Screenshot of Retired



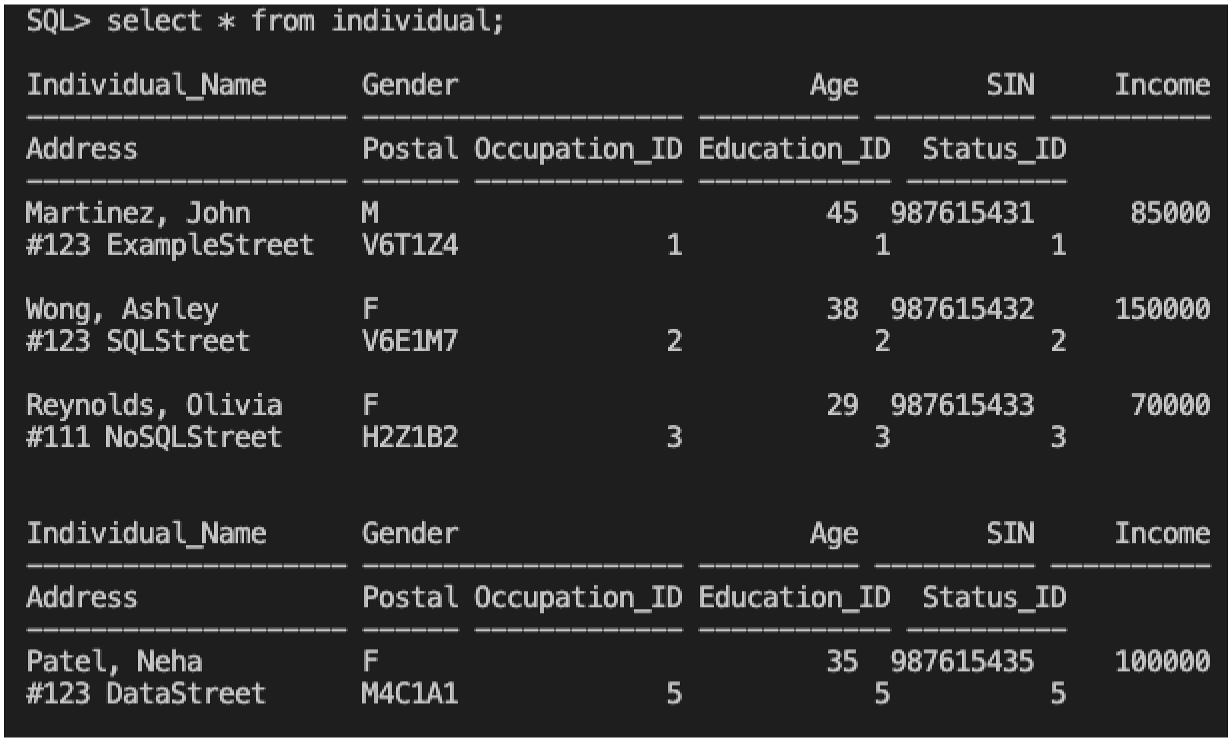
```
SQL> describe skills;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------------
 Skill_ID                                  NOT NULL NUMBER(38)
 Skill_Name                                         VARCHAR2(50)
```

Fig. 14 Screenshot of Skills



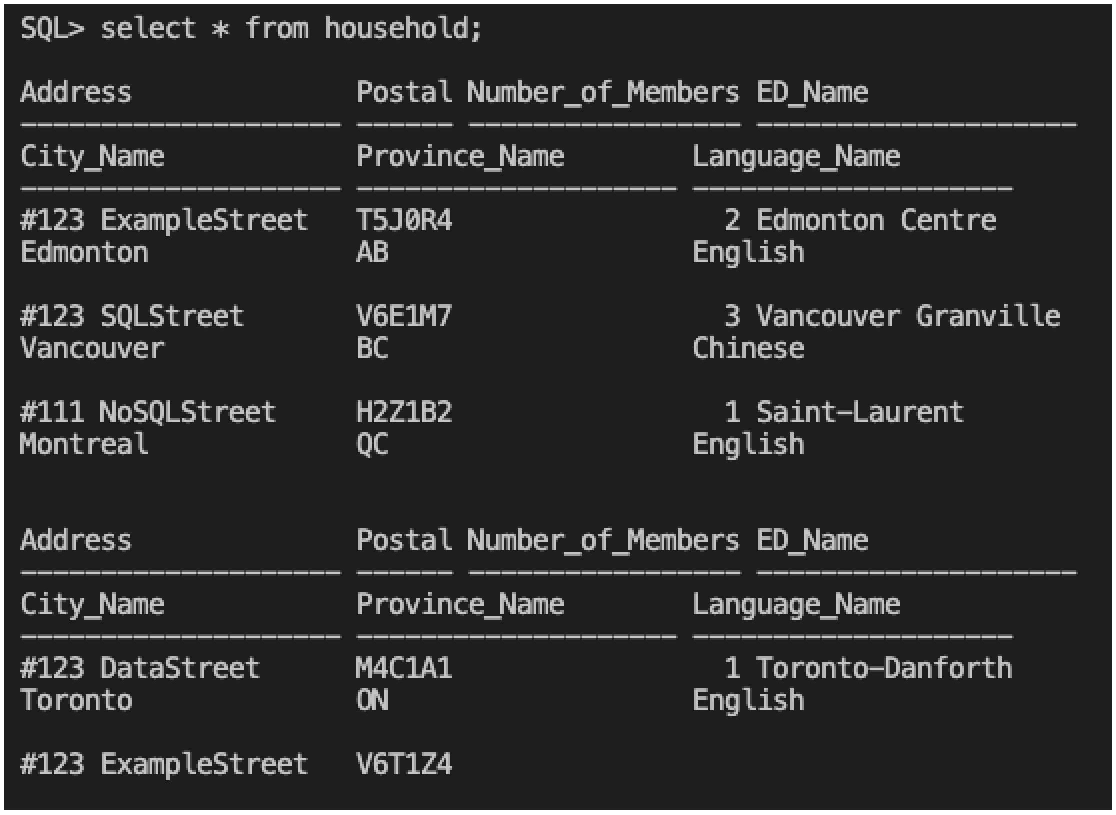
```
SQL> describe individualskills;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------
 SIN                                       NOT NULL NUMBER(38)
 Skill_ID                                  NOT NULL NUMBER(38)
```

Fig. 15 Screenshot of Individual skills



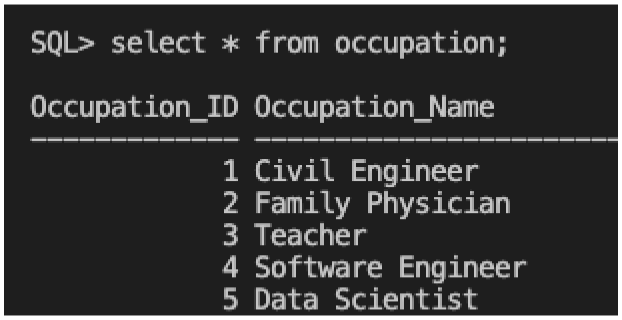
```
SQL> select * from individual;

Individual_Name      Gender                      Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Martinez, John       M                            45  987615431      85000
#123 ExampleStreet   V6T1Z4             1            1          1

Wong, Ashley         F                            38  987615432     150000
#123 SQLStreet       V6E1M7             2            2          2

Reynolds, Olivia     F                            29  987615433      70000
#111 NoSQLStreet     H2Z1B2             3            3          3


Individual_Name      Gender                      Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Patel, Neha          F                            35  987615435     100000
#123 DataStreet      M4C1A1             5            5          5
```

Fig. 16 Screenshot of Individual Selection



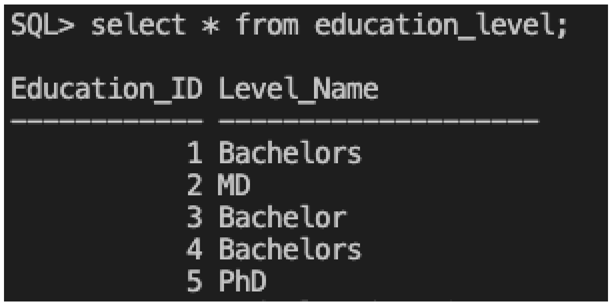
```
SQL> select * from household;

Address              Postal Number_of_Members ED_Name
-------------------- ------ ----------------- --------------------
City_Name            Province_Name        Language_Name
-------------------- -------------------- --------------------
#123 ExampleStreet   T5J0R4                 2 Edmonton Centre
Edmonton             AB                   English

#123 SQLStreet       V6E1M7                 3 Vancouver Granville
Vancouver            BC                   Chinese

#111 NoSQLStreet     H2Z1B2                 1 Saint-Laurent
Montreal             QC                   English


Address              Postal Number_of_Members ED_Name
-------------------- ------ ----------------- --------------------
City_Name            Province_Name        Language_Name
-------------------- -------------------- --------------------
#123 DataStreet      M4C1A1                 1 Toronto-Danforth
Toronto              ON                   English

#123 ExampleStreet   V6T1Z4
```

Fig. 17 Screenshot of Household Selection



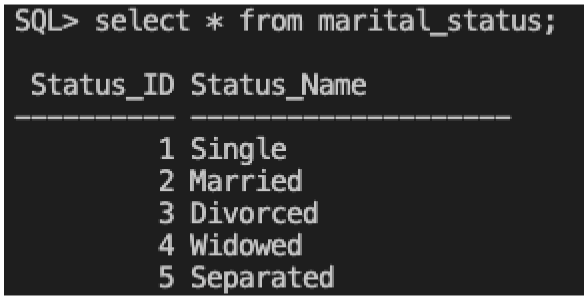
```
SQL> select * from occupation;

Occupation_ID Occupation_Name
------------- ----------------------
            1 Civil Engineer
            2 Family Physician
            3 Teacher
            4 Software Engineer
            5 Data Scientist
```

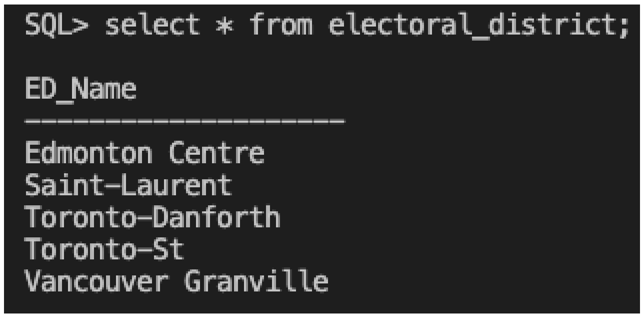
Fig. 18 Screenshot of Occupation Selection

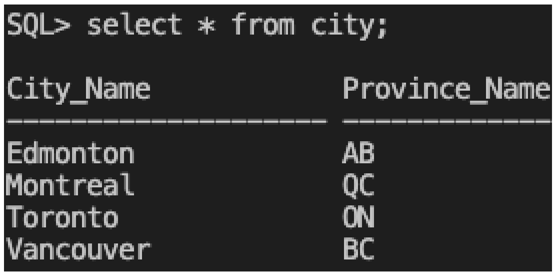


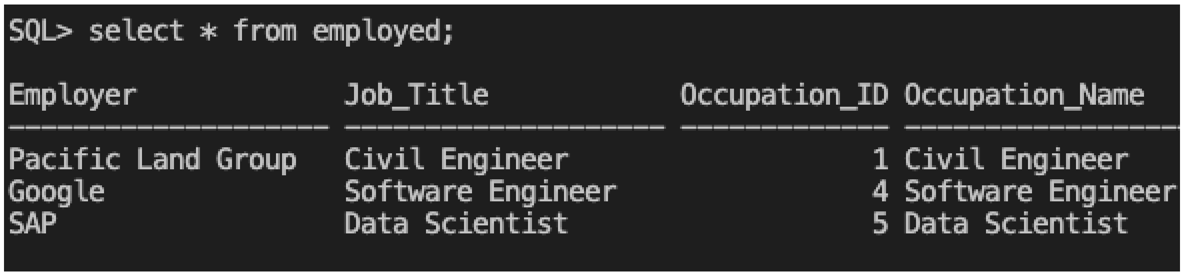
```
SQL> select * from education_level;

Education_ID Level_Name
------------ --------------------
           1 Bachelors
           2 MD
           3 Bachelor
           4 Bachelors
           5 PhD
```

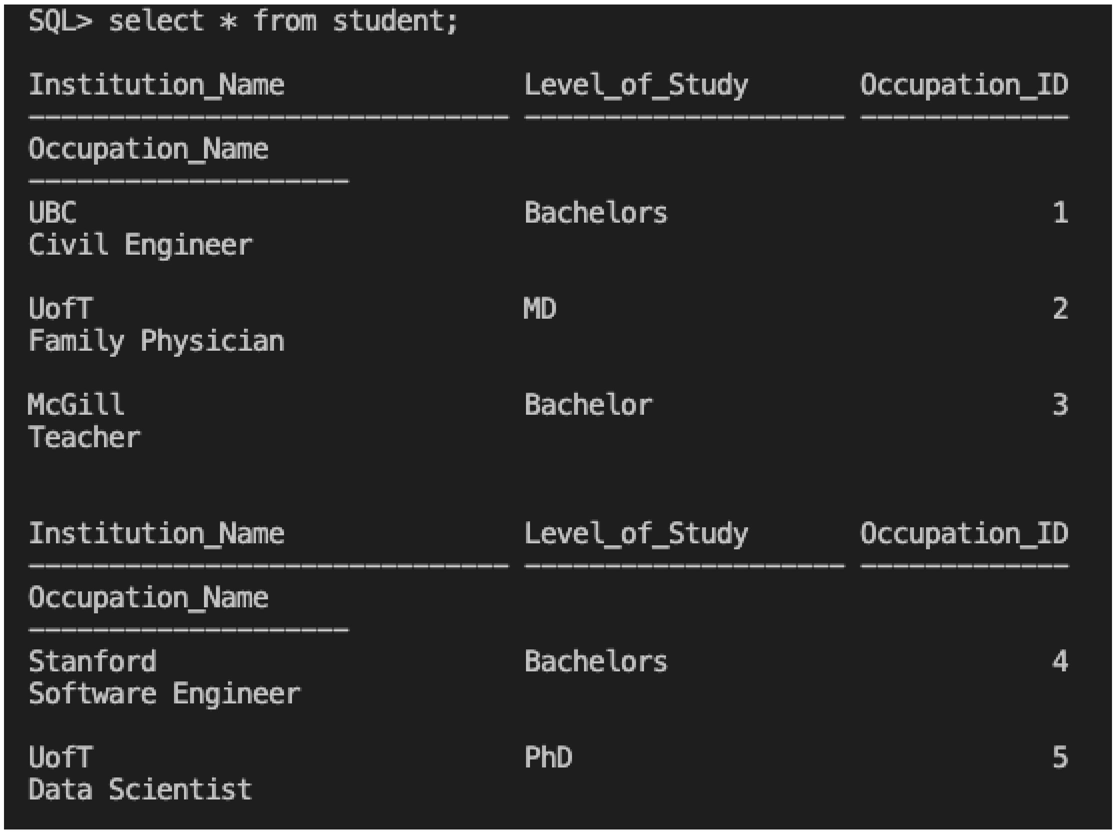
Fig. 19 Screenshot of education level Selection


```
SQL> select * from marital_status;

 Status_ID Status_Name
---------- --------------------
         1 Single
         2 Married
         3 Divorced
         4 Widowed
         5 Separated
```
Fig. 20 Screenshot of marital status Selection


```
SQL> select * from electoral_district;

ED_Name
--------------------
Edmonton Centre
Saint-Laurent
Toronto-Danforth
Toronto-St
Vancouver Granville
```
Fig. 21 Screenshot of electoral district Selection

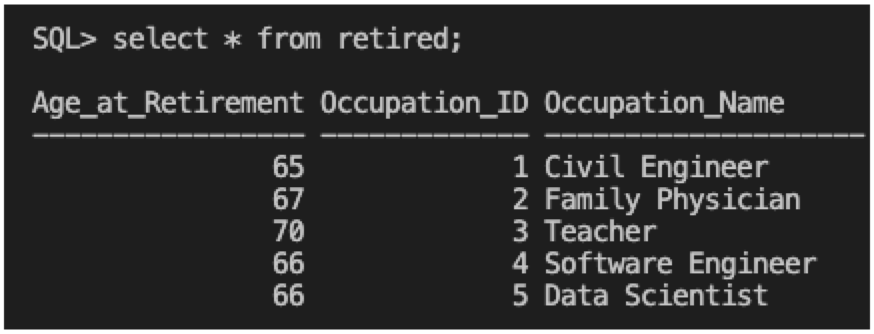

```
SQL> select * from city;

City_Name            Province_Name
-------------------- -------------
Edmonton             AB
Montreal             QC
Toronto              ON
Vancouver            BC
```
Fig. 22 Screenshot of city Selection


```
SQL> select * from employed;

Employer             Job_Title            Occupation_ID Occupation_Name
-------------------- -------------------- ------------- ----------------
Pacific Land Group   Civil Engineer                   1 Civil Engineer
Google               Software Engineer                4 Software Engineer
SAP                  Data Scientist                   5 Data Scientist
```
Fig. 23 Screenshot of employed Selection



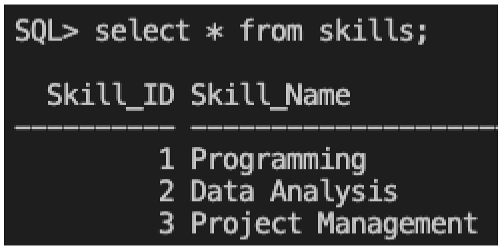
```
SQL> select * from student;

Institution_Name               Level_of_Study      Occupation_ID
------------------------------ -------------------- -------------
Occupation_Name
--------------------
UBC                            Bachelors                        1
Civil Engineer

UofT                           MD                               2
Family Physician

McGill                         Bachelor                         3
Teacher


Institution_Name               Level_of_Study      Occupation_ID
------------------------------ -------------------- -------------
Occupation_Name
--------------------
Stanford                       Bachelors                        4
Software Engineer

UofT                           PhD                              5
Data Scientist
```

Fig. 24 Screenshot of student Selection



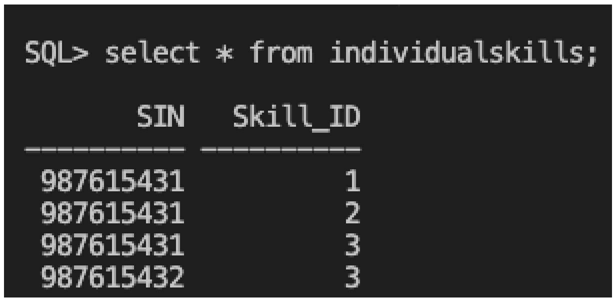
```
SQL> select * from retired;

Age_at_Retirement Occupation_ID Occupation_Name
----------------- ------------- --------------------
               65             1 Civil Engineer
               67             2 Family Physician
               70             3 Teacher
               66             4 Software Engineer
               66             5 Data Scientist
```

Fig. 25 Screenshot of retired Selection



```
SQL> select * from skills;

  Skill_ID Skill_Name
---------- --------------------
         1 Programming
         2 Data Analysis
         3 Project Management
```

Fig. 26 Screenshot of skills Selection


```
SQL> select * from individualskills;

       SIN   Skill_ID
---------- ----------
 987615431          1
 987615431          2
 987615431          3
 987615432          3
```
Fig. 27 Screenshot of individual skills Selection

d. A list of all SQL queries used and where it can be found in the code (i.e., file name and line number(s)). For SQL query requirements, check the rubric listed on Canvas for Milestone 4.

Our queries can be found in **Node_Project/queries.sql**
Our list:

```
-- INSERT
-- "insert an individual"
INSERT INTO
   Individual (
      "Individual_Name",
      "Gender",
      "Age",
      "SIN",
      "Income",
      "Address",
      "Postal_Code",
      "Occupation_ID",
      "Education_ID",
      "Status_ID"
   )
VALUES
   (
      :individualName,
      :gender,
      :age,
      :sin,
      :income,
      :address,
        :postalCode,
        :occupationId,
        :educationId,
        :statusId
    );


-- DELETE
-- "delete a household, deletes the individual (ON DELETE CASCADE)"
DELETE FROM
    Household
WHERE
    "Address" = :address
    AND "Postal_Code" = :postalCode;


-- UPDATE
-- "update individual address, postal code, also updates in the household using sin"
UPDATE
    Individual
SET
    "Address" = :newAddress,
    "Postal_Code" = :newPostalCode
WHERE
    "SIN" = :sin;


-- SELECTION
-- "select all the individuals having particular gender and income > than given income "
SELECT
    *
FROM
    Individual
WHERE
    "Gender" = :gender
    AND "Income" > :income;


-- PROJECTION
-- "selects name,age and address of the individual"
SELECT
    "Address",
    "Postal_Code",
    "Individual_Name"
```

```sql
FROM
   Individual;


-- JOIN
-- "Utilizes the join of Individual and household to filter out individuals in any given city"
SELECT
   I."Individual_Name",
   I."Address",
   I."Postal_Code",
   H."City_Name"
FROM
   Individual I
   JOIN Household H ON I."Postal_Code" = H."Postal_Code"
WHERE
   H."City_Name" = :cityName;


-- AGGREGATION WITH GROUP BY
-- Get Average income by education
SELECT
   E."Level_Name",
   AVG(I."Income") AS "Average_Income"
FROM
   Individual I
   JOIN Education_Level E ON I."Education_ID" = E."Education_ID"
GROUP BY
   E."Level_Name";


-- AGGREGATION WITH HAVING
-- Get Average Income by Occupation
SELECT
   O."Occupation_Name",
   AVG(I."Income") AS "Average_Income"
FROM
   Individual I
   JOIN Occupation O ON I."Occupation_ID" = O."Occupation_ID"
GROUP BY
   O."Occupation_Name"
HAVING
   AVG(I."Income") > :givenIncome;
```

-- NESTED AGGREGATION BY GROUP BY

```
-- Get average of average income of city, only city where average income is greater than given
income
SELECT
    City_Avg."City_Name",
    AVG(City_Avg."Average_Income") AS "City_Avg_Income"
FROM
    (
        SELECT
            H."City_Name",
            I."Individual_Name",
            AVG(I."Income") AS "Average_Income"
        FROM
            Individual I
            JOIN Household H ON I."Postal_Code" = H."Postal_Code"
        GROUP BY
            H."City_Name",
            I."Individual_Name"
    ) City_Avg
GROUP BY
    City_Avg."City_Name"
HAVING
    AVG(City_Avg."Average_Income") > :givenIncome;
```

-- DIVISION

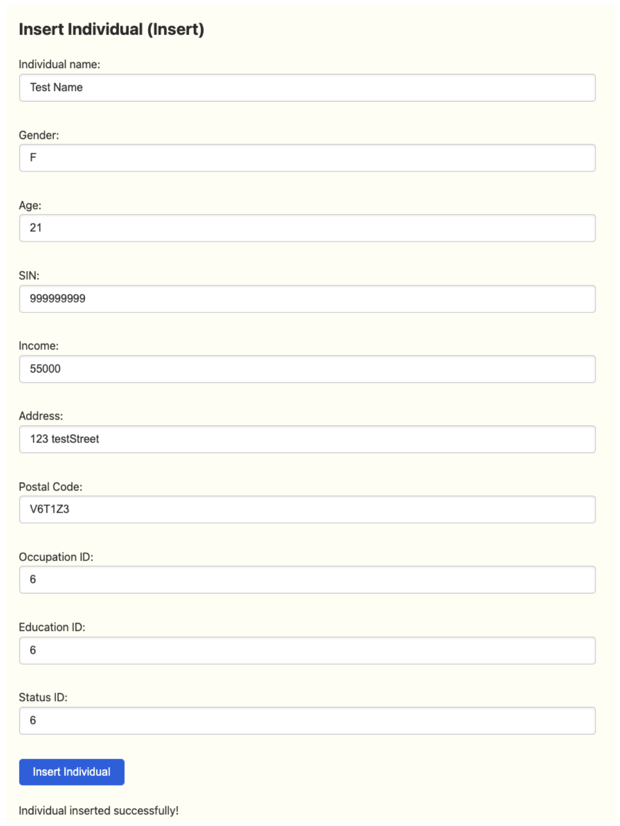
```
-- Find all individuals having every skill
SELECT
    I."Individual_Name"
FROM
    Individual I
WHERE
    NOT EXISTS (
        SELECT
            S."Skill_ID"
        FROM
            Skills S
        WHERE
            NOT EXISTS (
                SELECT
                    ISk."SIN"
                FROM
                    IndividualSkills ISk
                WHERE
            ISk."SIN" = I."SIN"
            AND ISk."Skill_ID" = S."Skill_ID"
        )
    );
```

e. Screenshots demonstrating the functionality of each query using the GUI. We want to see a before/during/after progression of events. For example, the before screenshot would be what data is in the table before you run the query, the during screenshot(s) is how the query is triggered using the GUI, and the after screenshot is what data is in your table afterwards. Please label each set of screenshots with the name of the query it is meant to address (e.g., "Insert Operation")

i. You need only to include screenshots for the required queries – if you implemented more than what was required, screenshots are not needed for those extra queries.

INSERT:

Before:



Insert Individual (Insert)

Individual name: Test Name

Gender: F

Age: 21

SIN: 999999999

Income: 55000

Address: 123 testStreet

Postal Code: V6T1Z3

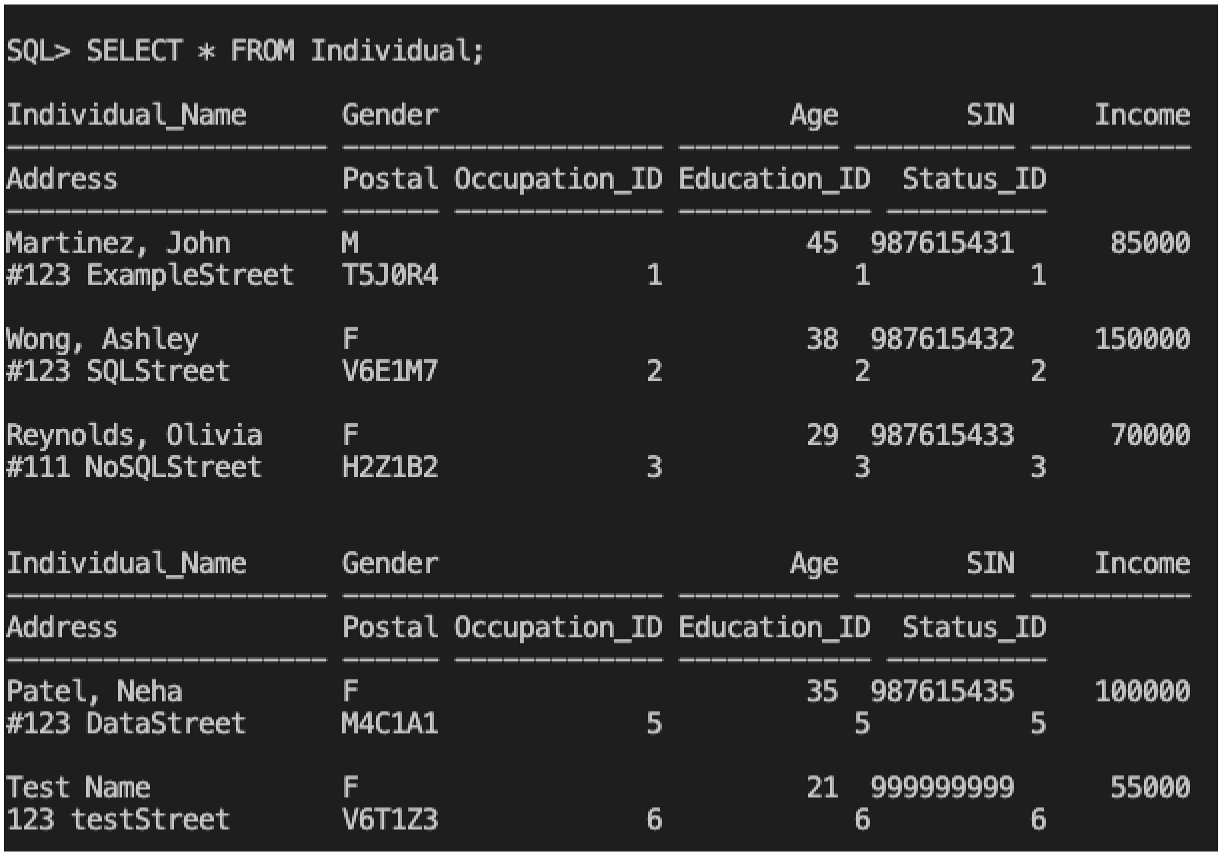
Occupation ID: 6

Education ID: 6

Status ID: 6

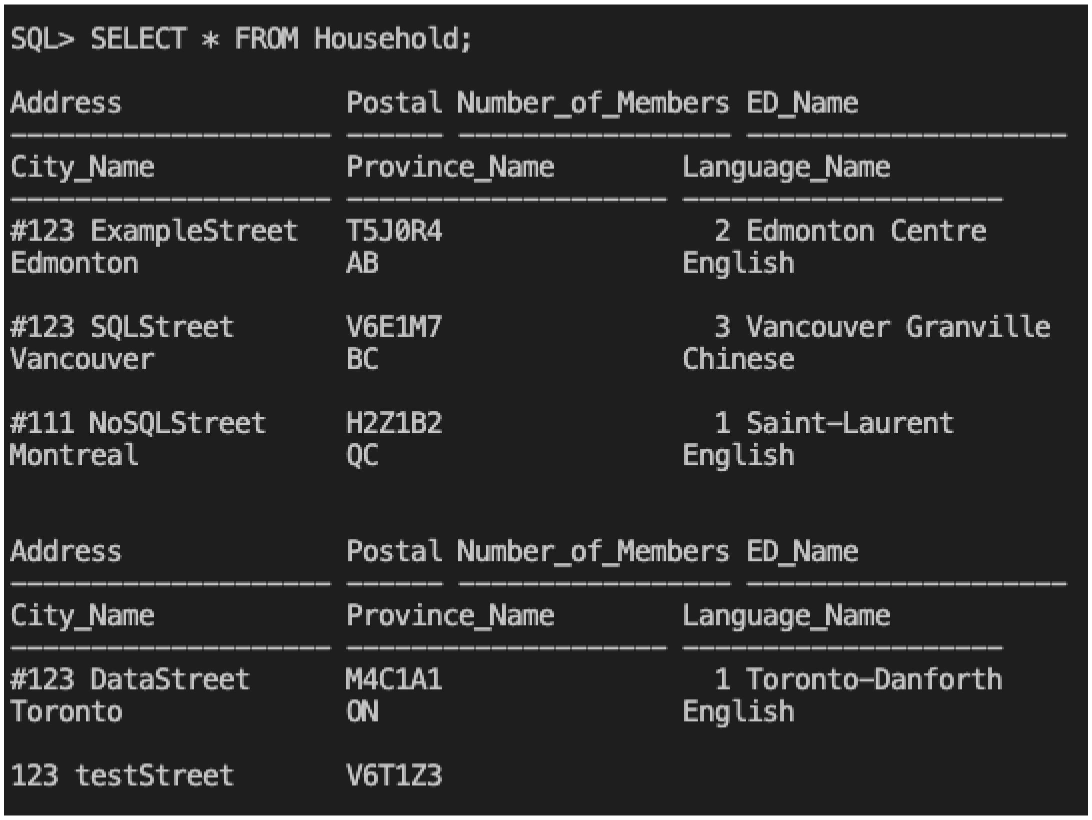
Individual inserted successfully!

AFTER:



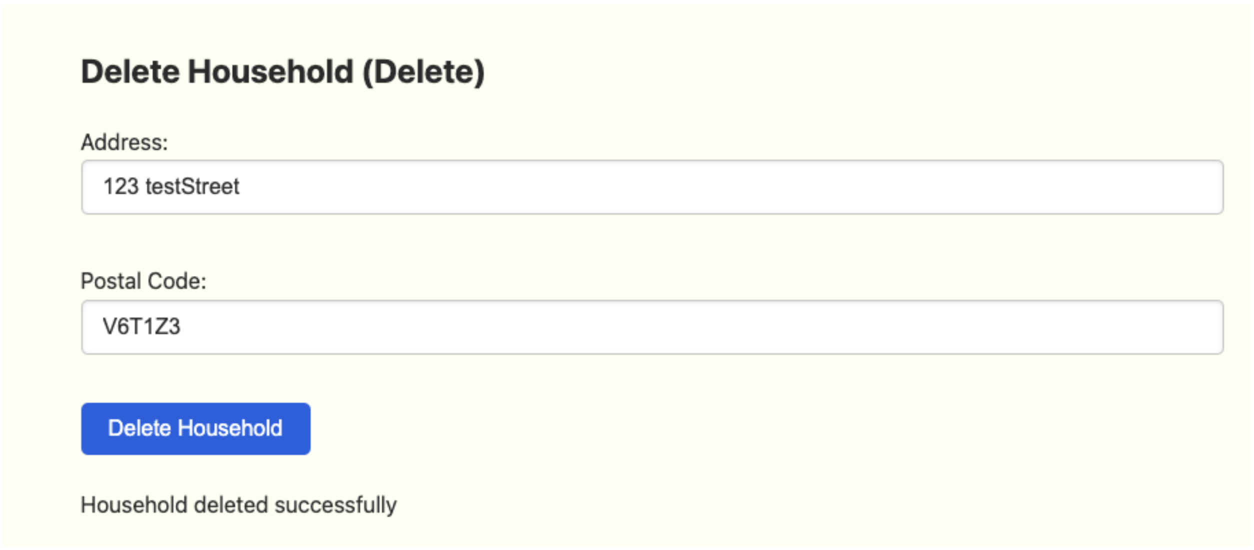
```
SQL> SELECT * FROM Individual;

Individual_Name      Gender                      Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Martinez, John       M                            45  987615431      85000
#123 ExampleStreet   T5J0R4             1            1          1

Wong, Ashley         F                            38  987615432     150000
#123 SQLStreet       V6E1M7             2            2          2

Reynolds, Olivia     F                            29  987615433      70000
#111 NoSQLStreet     H2Z1B2             3            3          3


Individual_Name      Gender                      Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Patel, Neha          F                            35  987615435     100000
#123 DataStreet      M4C1A1             5            5          5

Test Name            F                            21  999999999      55000
123 testStreet       V6T1Z3             6            6          6
```

DELETE:
Before:



```
SQL> SELECT * FROM Household;

Address                  Postal Number_of_Members ED_Name
------------------------ ------ ----------------- ------------------------
City_Name                Province_Name            Language_Name
------------------------ ------------------------ ------------------------
#123 ExampleStreet       T5J0R4                     2 Edmonton Centre
Edmonton                 AB                       English

#123 SQLStreet           V6E1M7                     3 Vancouver Granville
Vancouver                BC                       Chinese

#111 NoSQLStreet         H2Z1B2                     1 Saint-Laurent
Montreal                 QC                       English


Address                  Postal Number_of_Members ED_Name
------------------------ ------ ----------------- ------------------------
City_Name                Province_Name            Language_Name
------------------------ ------------------------ ------------------------
#123 DataStreet          M4C1A1                     1 Toronto-Danforth
Toronto                  ON                       English

123 testStreet           V6T1Z3
```

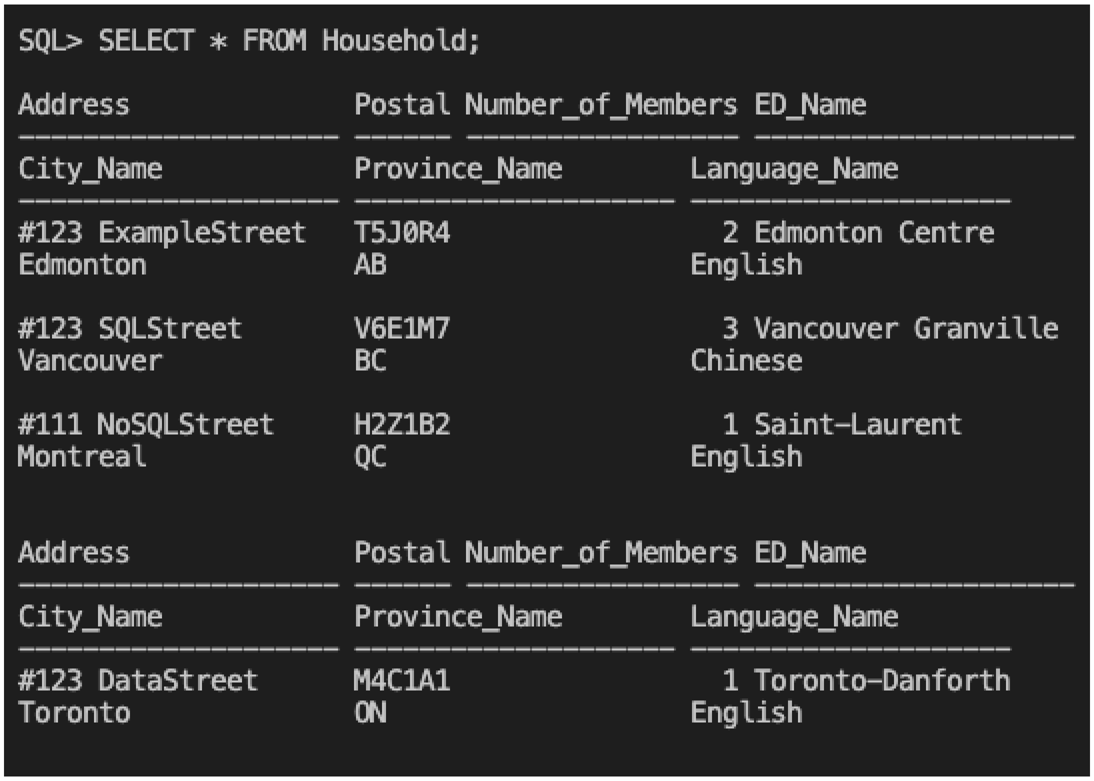
After:



Delete Household (Delete)

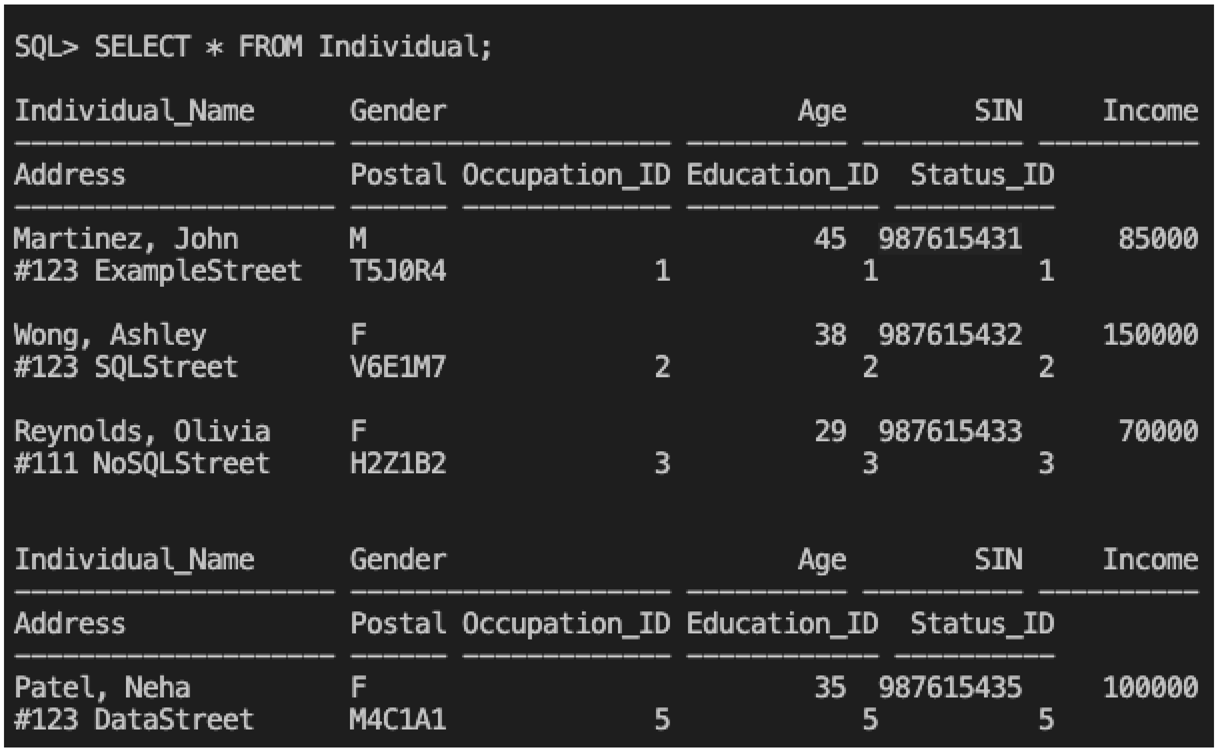
Address:	123 testStreet
Postal Code:	V6T1Z3

Household deleted successfully



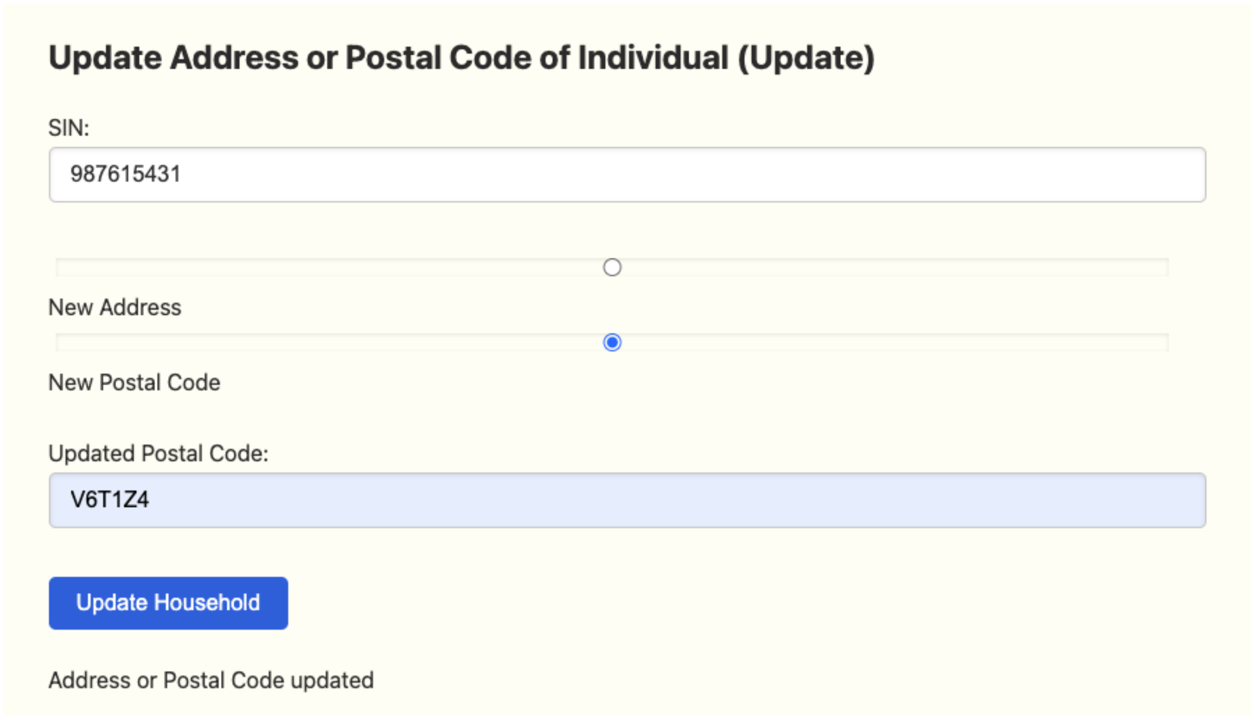
```
SQL> SELECT * FROM Household;

Address              Postal Number_of_Members ED_Name
-------------------- ------ ----------------- --------------------
City_Name            Province_Name        Language_Name
-------------------- -------------------- --------------------
#123 ExampleStreet   T5J0R4                 2 Edmonton Centre
Edmonton             AB                   English

#123 SQLStreet       V6E1M7                 3 Vancouver Granville
Vancouver            BC                   Chinese

#111 NoSQLStreet     H2Z1B2                 1 Saint-Laurent
Montreal             QC                   English


Address              Postal Number_of_Members ED_Name
-------------------- ------ ----------------- --------------------
City_Name            Province_Name        Language_Name
-------------------- -------------------- --------------------
#123 DataStreet      M4C1A1                 1 Toronto-Danforth
Toronto              ON                   English
```

Update:
Before:



```
SQL> SELECT * FROM Individual;

Individual_Name      Gender                      Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Martinez, John       M                            45  987615431      85000
#123 ExampleStreet   T5J0R4             1            1          1

Wong, Ashley         F                            38  987615432     150000
#123 SQLStreet       V6E1M7             2            2          2

Reynolds, Olivia     F                            29  987615433      70000
#111 NoSQLStreet     H2Z1B2             3            3          3


Individual_Name      Gender                      Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Patel, Neha          F                            35  987615435     100000
#123 DataStreet      M4C1A1             5            5          5
```

After



Update Address or Postal Code of Individual (Update)

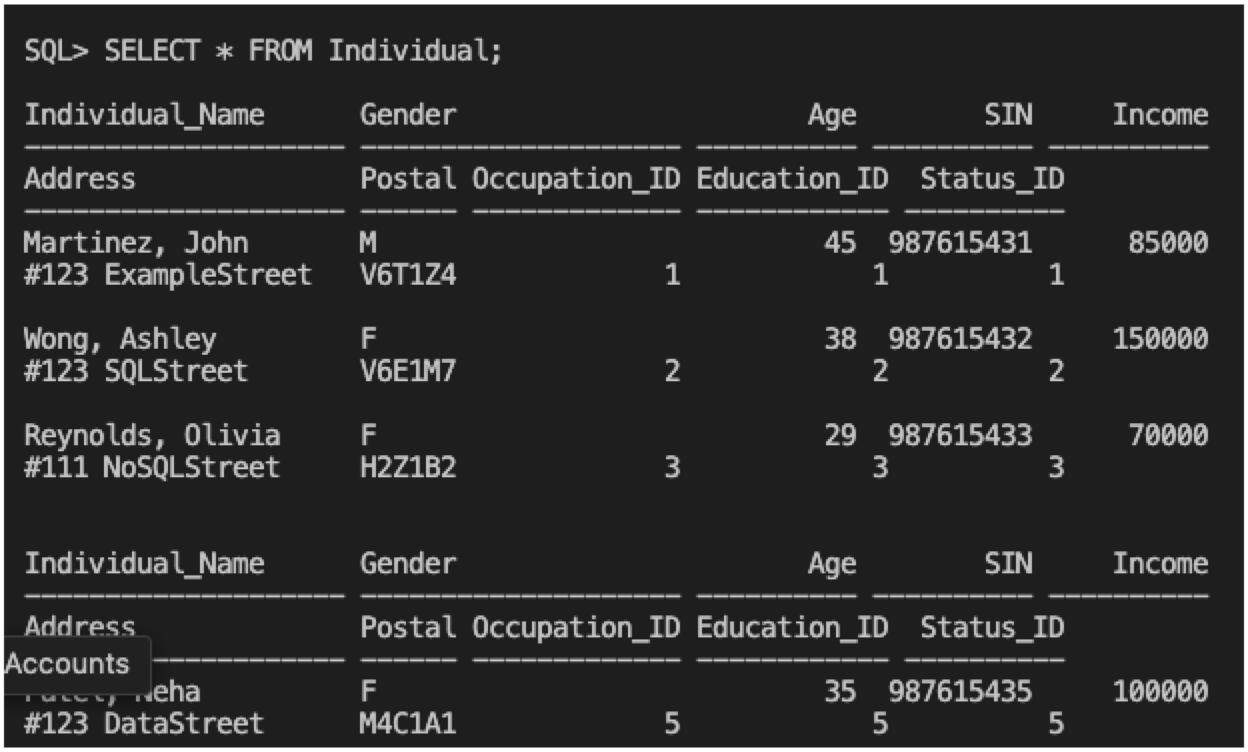
SIN: 987615431

[○] New Address

[● New Postal Code]

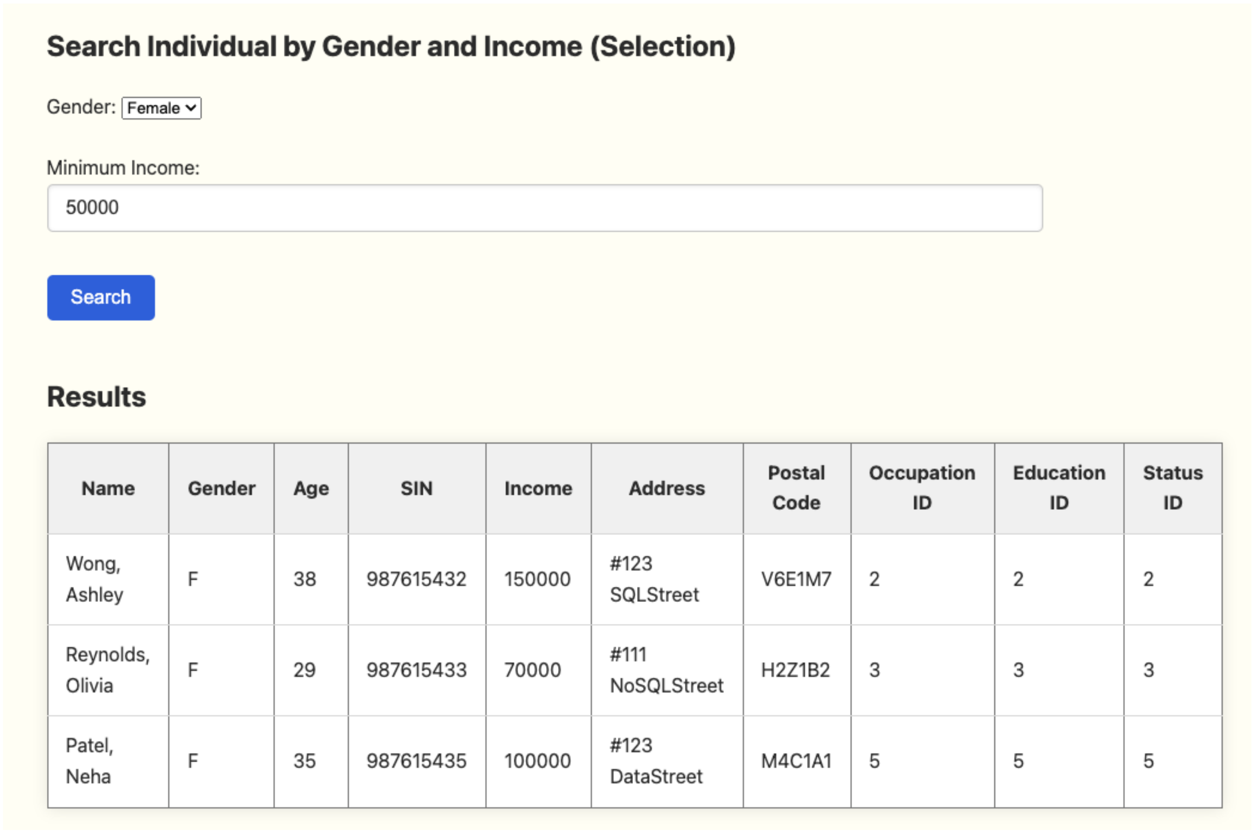
Updated Postal Code: V6T1Z4

Address or Postal Code updated



```
SQL> SELECT * FROM Individual;

Individual_Name      Gender                     Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
-------------------- ------ ------------- ------------ ----------
Martinez, John       M                           45  987615431      85000
#123 ExampleStreet   V6T1Z4             1            1          1

Wong, Ashley         F                           38  987615432     150000
#123 SQLStreet       V6E1M7             2            2          2

Reynolds, Olivia     F                           29  987615433      70000
#111 NoSQLStreet     H2Z1B2             3            3          3


Individual_Name      Gender                     Age        SIN     Income
-------------------- -------------------- ---------- ---------- ----------
Address              Postal Occupation_ID Education_ID  Status_ID
Accounts ----------- ------ ------------- ------------ ----------
     , Neha          F                           35  987615435     100000
#123 DataStreet      M4C1A1             5            5          5
```

Selection:


Search Individual by Gender and Income (Selection)

Gender: Female

Minimum Income:

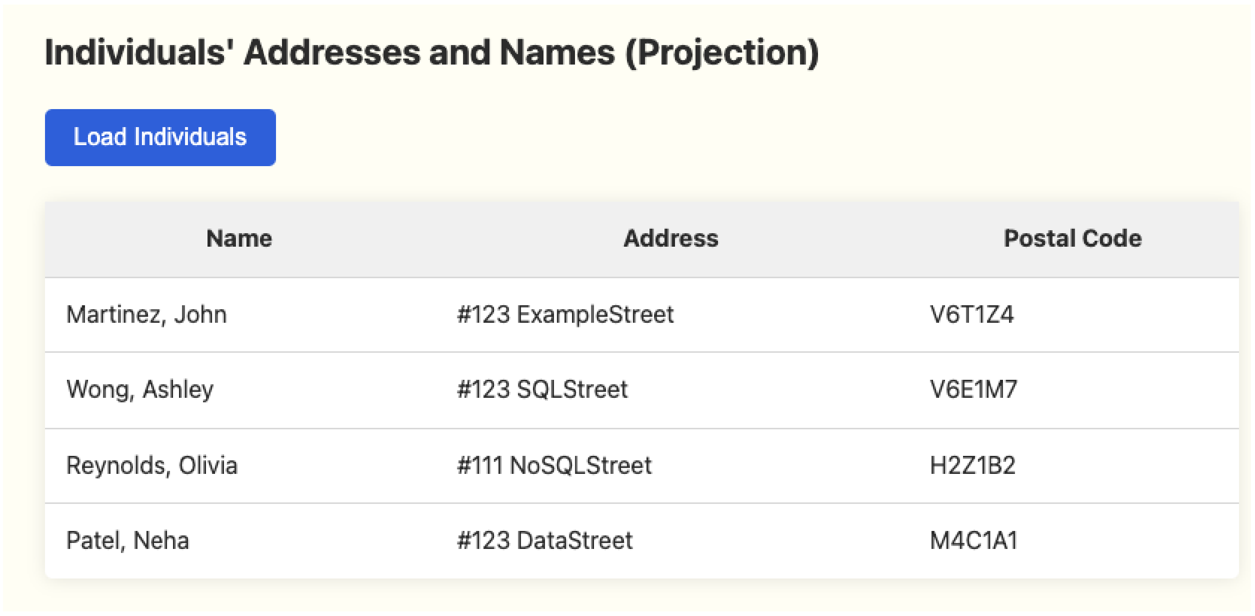
50000

Search

Results

Name	Gender	Age	SIN	Income	Address	Postal Code	Occupation ID	Education ID	Status ID
Wong, Ashley	F	38	987615432	150000	#123 SQLStreet	V6E1M7	2	2	2
Reynolds, Olivia	F	29	987615433	70000	#111 NoSQLStreet	H2Z1B2	3	3	3
Patel, Neha	F	35	987615435	100000	#123 DataStreet	M4C1A1	5	5	5

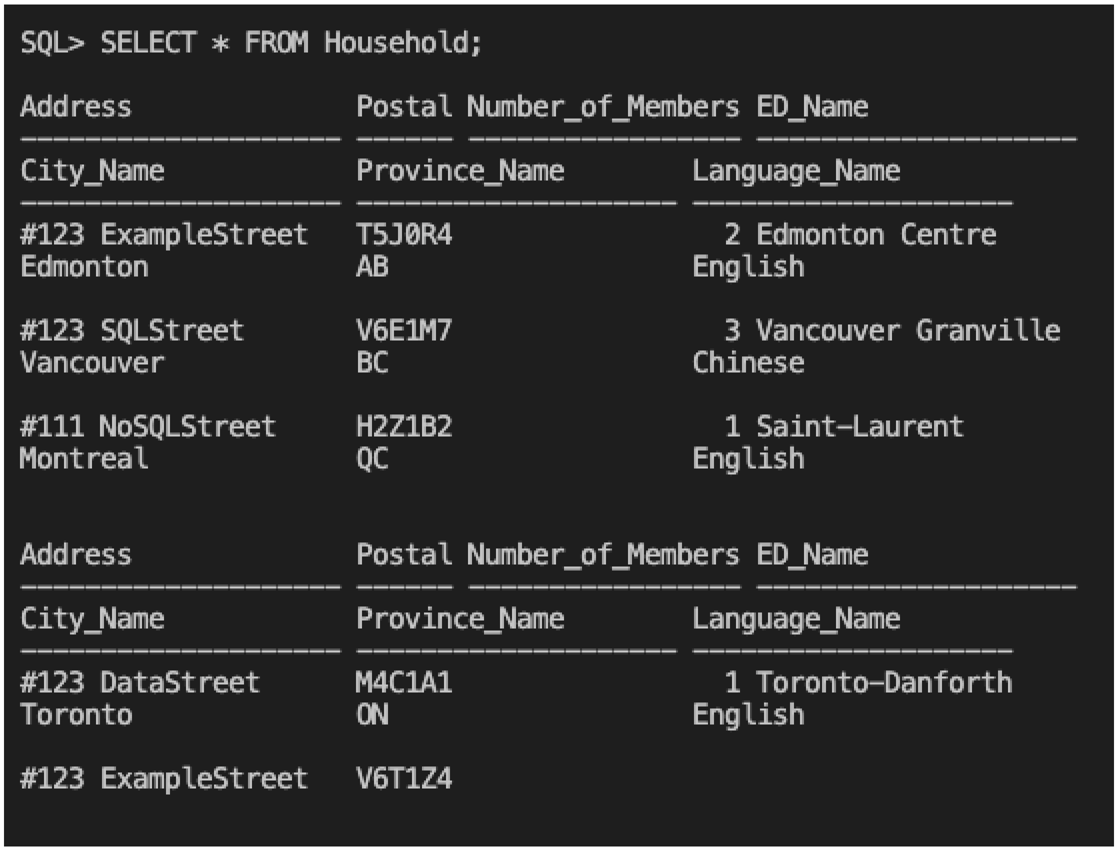
Projection:


Individuals' Addresses and Names (Projection)

Load Individuals

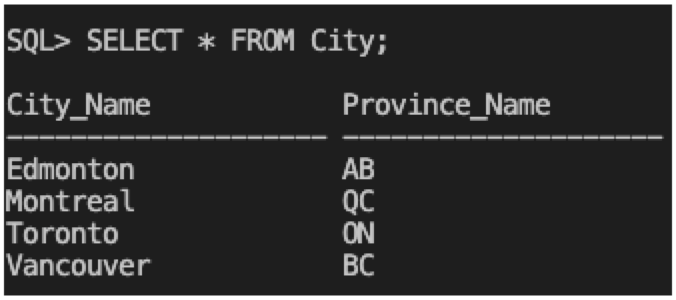
Name	Address	Postal Code
Martinez, John	#123 ExampleStreet	V6T1Z4
Wong, Ashley	#123 SQLStreet	V6E1M7
Reynolds, Olivia	#111 NoSQLStreet	H2Z1B2
Patel, Neha	#123 DataStreet	M4C1A1

Join:
Before:

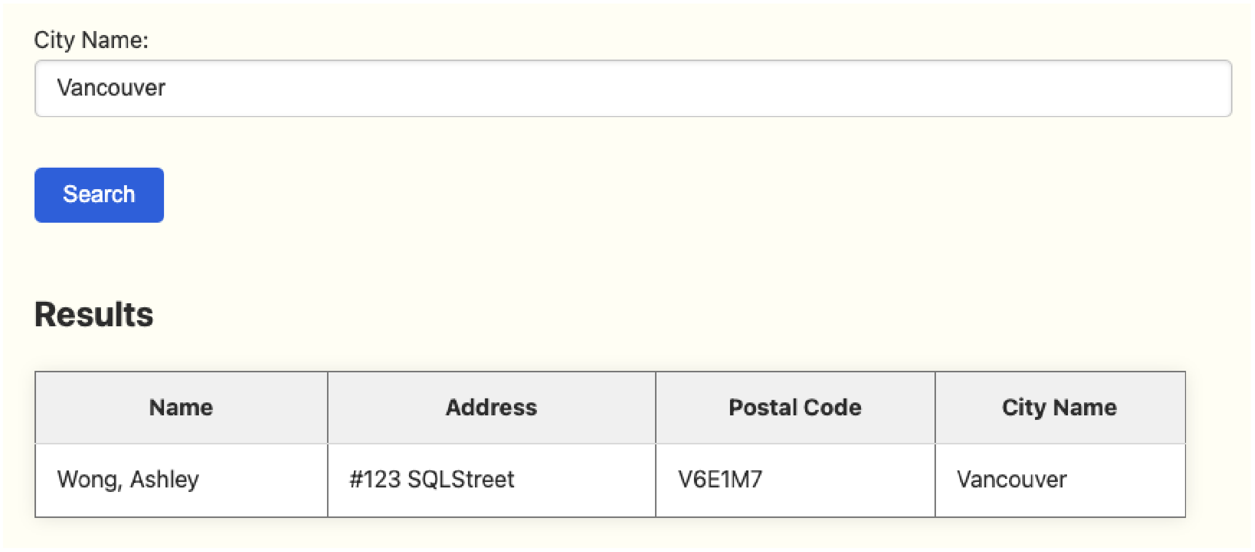


```
SQL> SELECT * FROM Household;

Address              Postal Number_of_Members ED_Name
-------------------- ------ ----------------- --------------------
City_Name            Province_Name        Language_Name
-------------------- -------------------- --------------------
#123 ExampleStreet   T5J0R4                 2 Edmonton Centre
Edmonton             AB                   English

#123 SQLStreet       V6E1M7                 3 Vancouver Granville
Vancouver            BC                   Chinese

#111 NoSQLStreet     H2Z1B2                 1 Saint-Laurent
Montreal             QC                   English


Address              Postal Number_of_Members ED_Name
-------------------- ------ ----------------- --------------------
City_Name            Province_Name        Language_Name
-------------------- -------------------- --------------------
#123 DataStreet      M4C1A1                 1 Toronto-Danforth
Toronto              ON                   English

#123 ExampleStreet   V6T1Z4
```

After:



```
SQL> SELECT * FROM City;

City_Name            Province_Name
-------------------- --------------------
Edmonton             AB
Montreal             QC
Toronto              ON
Vancouver            BC
```



City Name:

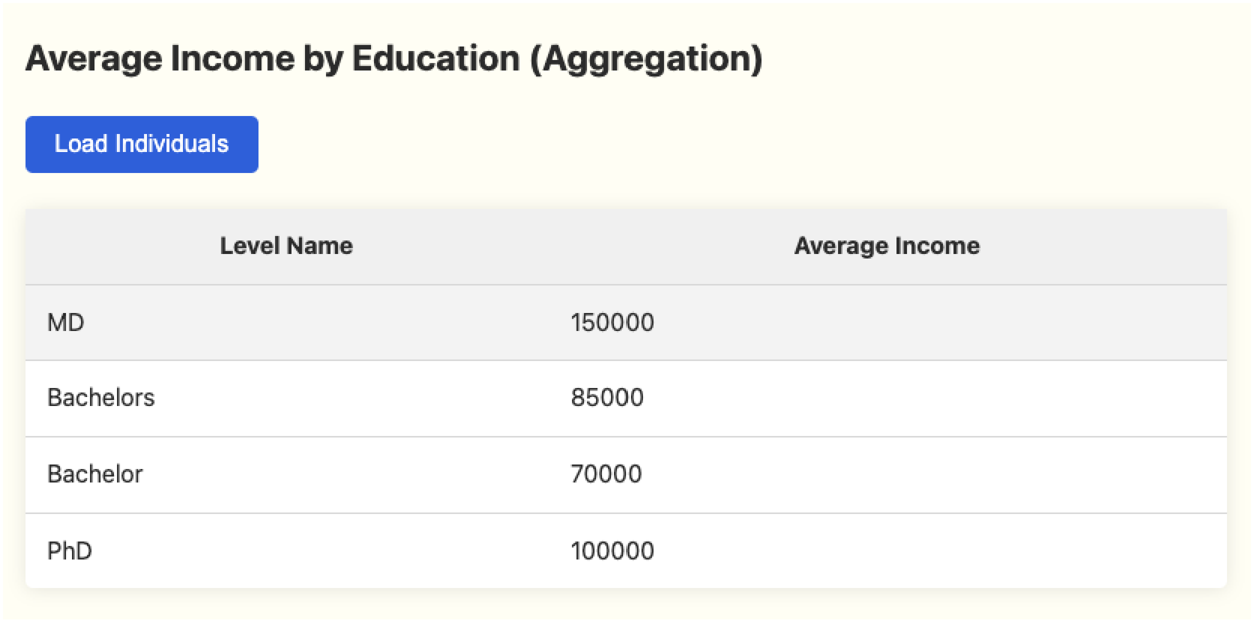
Vancouver

Search

Results

Name	Address	Postal Code	City Name
Wong, Ashley	#123 SQLStreet	V6E1M7	Vancouver

Aggregation:

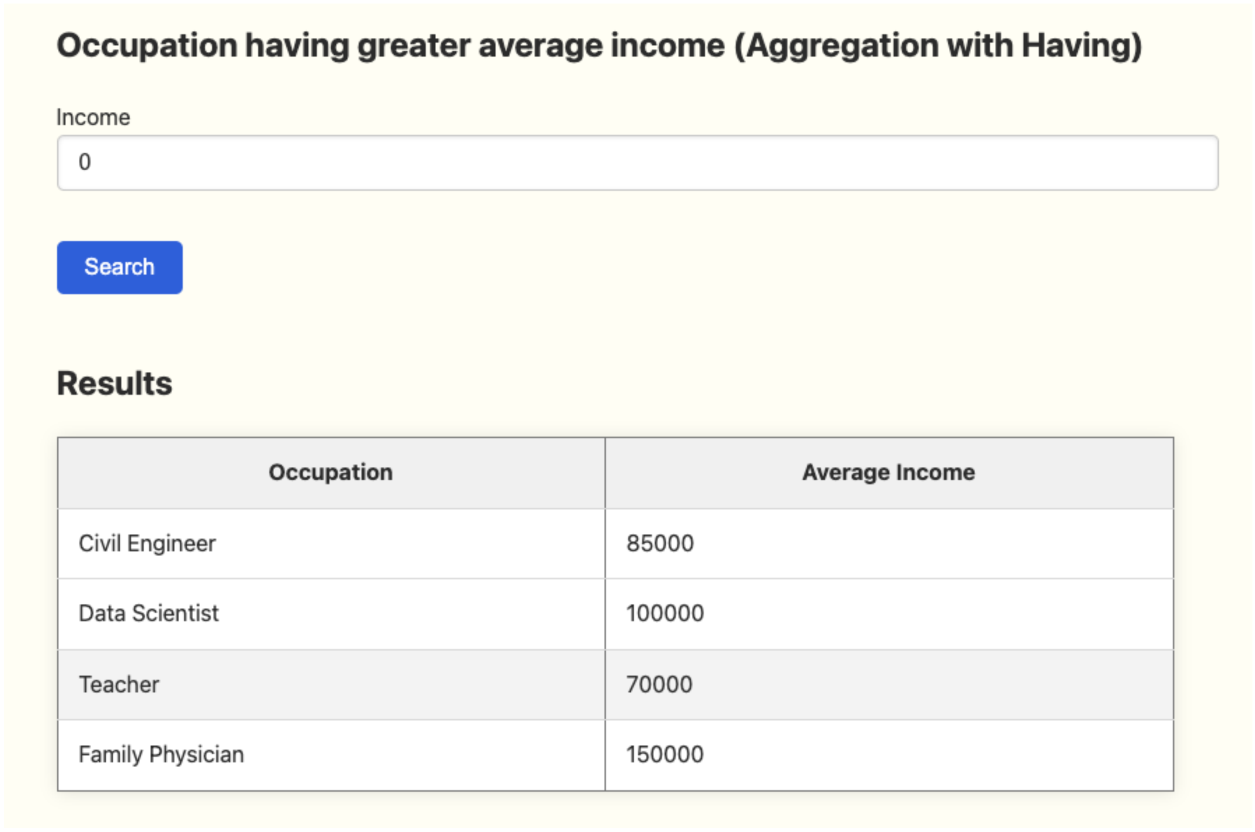


Average Income by Education (Aggregation)

Load Individuals

Level Name	Average Income
MD	150000
Bachelors	85000
Bachelor	70000
PhD	100000

Aggregation with having



Occupation having greater average income (Aggregation with Having)

Income

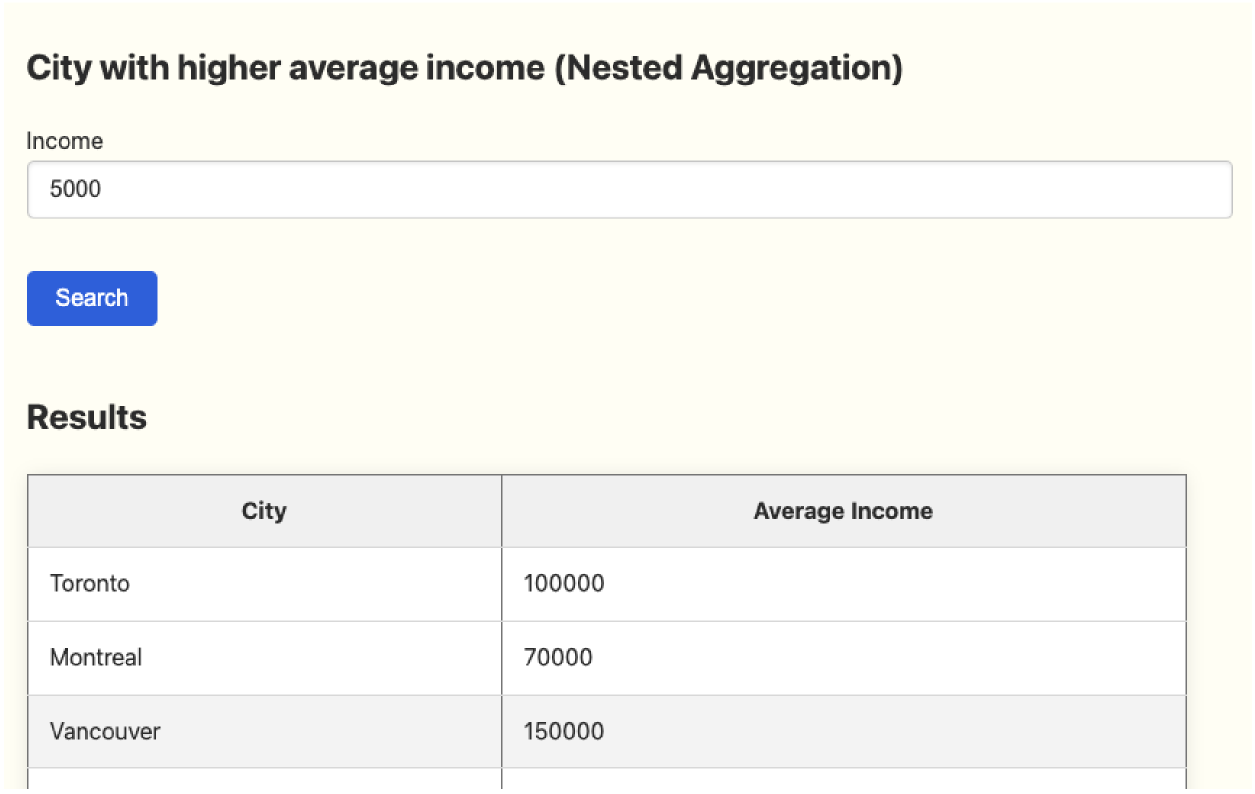
0

Search

Results

Occupation	Average Income
Civil Engineer	85000
Data Scientist	100000
Teacher	70000
Family Physician	150000

Nested aggregation by group by



City with higher average income (Nested Aggregation)

Income

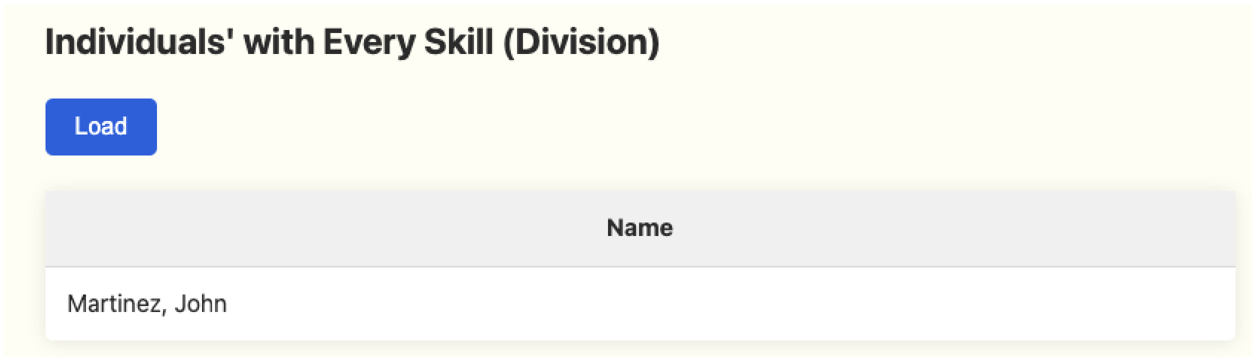
5000

Search

Results

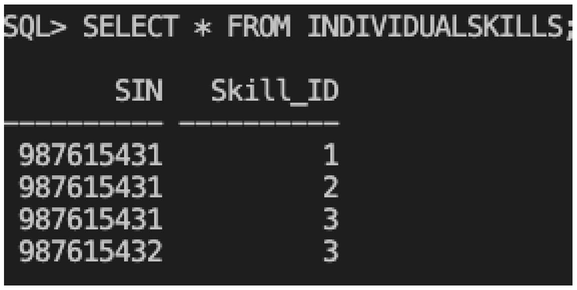
City	Average Income
Toronto	100000
Montreal	70000
Vancouver	150000

Division:



Individuals' with Every Skill (Division)

Name
Martinez, John



```
SQL> SELECT * FROM INDIVIDUALSKILLS;

       SIN   Skill_ID
---------- ----------
 987615431          1
 987615431          2
 987615431          3
 987615432          3
```