

Design of Query Execution Engine

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Assumption

The select condition are set by hard code.

The left relation of the join is the smaller table(in this project is the city.csv), the right relation of the join is the relatively bigger table(the country.csv in this project).

Design

Here is the brief introduction of Query Execution Engine Design . We have these java files in this project: Tables.java, Main.java and Join.java.

Table.java

The “tables” class represent a relation by holding a pointer to the relation csv file and implementing open(), getNext() and close() methods.

open(): open the csv file and loaded it to a String array list

getNext(): get the next row of the relation

close():close and clear all the resources we allocated for the process

Join.java

Join two relations under certain condition. Using iterator methods for tuple-based nested join.

```
open {
    left.open()
    right.open()
}

getNext {
    if (right == null) {
        left.getNext()
        if (left.getNext() is null);
        close()
        right.close()
        right.open()
    }
    if (t in Right match t in Left) {
```

```

        build the union and output
    }
}

close {
    left.close()
    right.close()
}

```

Main.java

Main method to execute query with tables stored in csv files and get right result with iterator method.

Validation:

Select all the cities in the City.csv file and Country.csv file whose population is more than 40% of the population of their entire country.

After run the main.java of this project, we get the result as follows:

```

Here is all the cities whose population is more than 40% of the population of their entire country:
'Nassau'
'George Town'
'Avarua'
'Djibouti'
'Stanley'
'Gibraltar'
'Longyearbyen'
'Bantam'
'El-Aaiún'
'Macao'
'Dalap-Uliga-Darrit'
'Koror'
'Adamstown'
'Doha'
'Saint-Pierre'
'Victoria'
'Singapore'
'Città del Vaticano'
The End

```

Here is the result from the MySQLWorkbench, the result is the same except they are in different sequence.

1

2

3

4

5

6

SELECT world.City.name

FROM world.City join world.Country

on world.City.CountryCode=world.Country.Code

WHERE world.City.Population > 0.4* world.Country.Population;

100%

32:4

Result Grid

Filter Rows:

Search

Export:

name	
Nassau	
Bantam	
Avarua	
George Town	
Djibouti	
El-AaiĀn	
Stanley	
Gibraltar	
Macao	
Dalap-Uliga-Darrit	
Adamstown	
Koror	
Doha	
Singapore	
Longyearbyen	
Saint-Pierre	
Victoria	
CittĀ del Vaticano	