Active Cases -

By removing **deaths** and **recoveries** from **total cases,** we get "currently infected cases" or "active cases" (cases still waiting for an outcome).

### Growth Factor of Monthly Confirmed Cases

Growth factor is the factor by which a quantity multiplies itself over time. The formula used is **month Confirmed Cases** / **Confirmed Cases on the previous month**.

A growth factor **above 1 indicates an increase**, whereas one which remains **between 0 and 1 it is a sign of decline**, with the quantity eventually becoming zero, whereas a growth factor constantly above 1 could signal exponential growth

### Total Cases (worldwide)

"Total Cases" = total cumulative count (927,980). This figure therefore includes deaths and recovered or discharged patients (cases with an outcome).

Types

**CREATE** **TYPE** countries\_t **AS** **OBJECT** **(**

countryid int**,**

country\_Region varchar2**(**60**),**

province\_State varchar2**(**50**),**

latitude number**(**8**,**4**),**

longtude number**(**8**,**4**)**

**)**

**/**

**create** **TYPE** panademic\_info\_t **as** **object(**

cid **ref** countries\_t**,**

pdate date**,**

no\_of\_covid\_confirmed number**(**5**),**

no\_of\_covid\_Recovered number**(**5**),**

no\_of\_covid\_deaths number**(**5**)**

**)**

**/**

-tables-

**create** **table** countries\_tlb **of** countries\_t**(**

countryid **primary** **key**

**)**

**/**

**create** **table** panademic\_info **of** panademic\_info\_t

**/**

------------- for testing-------------------

**insert** **into** countries\_tlb **values(**countries\_t**(**1**,**'British'**,**'uk'**,**123.123**,**321.123**))**

**/**

conn **/** **as** sysdba

**CREATE** **OR** **REPLACE** DIRECTORY MY\_DIRECTORY **AS** 'c:\dsda\_it17167710\_mid\';

**GRANT READ,** WRITE ON DIRECTORY MY\_DIRECTORY TO janith\_dsds;

**GRANT EXECUTE** ON SYS.utl\_file TO janith\_dsds;

**conn** janith\_dsds/dsda

**DECLARE**

F UTL\_FILE**.**FILE\_TYPE**;**

WRITE\_FILE UTL\_FILE**.**FILE\_TYPE**;**

covid\_LINE VARCHAR2 **(**1000**);**

covid\_date VARCHAR2**(**50**);**

i number**(**5**);**

**BEGIN**

F **:=** UTL\_FILE**.**FOPEN**(**'MY\_DIRECTORY'**,**'c:\dsda\_mid\_it17167710\covid\_Confirmed.CSV'**,**'R'**);**

WRITE\_FILE **:=**UTL\_FILE**.**FOPEN**(**'MY\_DIRECTORY'**,**'c:\dsda\_mid\_it17167710\covid\_dates.CSV'**,**'W'**);**

**IF** UTL\_FILE**.**IS\_OPEN**(**F**)** **THEN**

**LOOP**

**BEGIN**

UTL\_FILE**.**GET\_LINE**(**F**,** covid\_LINE**,** 1000**);**

**IF** covid\_LINE **IS** **NULL** **THEN**

**EXIT;**

**END** **IF;**

i **:=**5**;**

**LOOP**

**BEGIN**

covid\_date **:=** **replace(**REGEXP\_SUBSTR**(**covid\_LINE**,** '("([^"]\*)")|[^,]+'**,** 1**,** i**),**'"'**,**''**);**

UTL\_FILE**.**PUT\_LINE**(**WRITE\_FILE**,**covid\_date**);**

**COMMIT;**

i**:=**i+1**;**

**IF** covid\_date **IS** **NULL** **THEN**

**EXIT;**

**END** **IF;**

**END;**

**END** **LOOP;**

**EXIT;**

**create** **SEQUENCE** seq1

**start** **with** 1

**increment** **by** 1**;**

**CREATE** **OR** **REPLACE** **TRIGGER** covid\_countries\_trigger

**BEFORE** **INSERT**

**ON** countries\_tlb

**REFERENCING** **NEW** **AS** **NEW**

**FOR** **EACH** **ROW**

**BEGIN**

**SELECT** seq1**.nextval** **INTO** **:NEW.**countryid **FROM** dual**;**

**END;**

**/**

-----------------------------------------------------

**ALTER** **SESSION** **SET** NLS\_DATE\_FORMAT **=** 'MM/DD/YYYY'**;**

**DECLARE**

ConfirmedCSV UTL\_FILE**.**FILE\_TYPE**;**

DeathsCSV UTL\_FILE**.**FILE\_TYPE**;**

RecoveredCSV UTL\_FILE**.**FILE\_TYPE**;**

WIRTE\_FILE UTL\_FILE**.**FILE\_TYPE**;**

covid\_LINE\_C VARCHAR2 **(**2000**);**

covid\_LINE\_D VARCHAR2 **(**2000**);**

covid\_LINE\_R VARCHAR2 **(**2000**);**

covid\_LINE2 VARCHAR2 **(**2000**);**

covid\_date VARCHAR2**(**50**);**

covid\_Confirmed NUMBER**(**7**);**

covid\_Deaths NUMBER**(**7**);**

covid\_Recoverd NUMBER**(**7**);**

covid\_state VARCHAR2**(**50**);**

covid\_region VARCHAR2**(**50**);**

covid\_lat NUMBER**(**8**,**4**);**

covid\_long NUMBER**(**8**,**4**);**

i number**(**5**);**

**row** number**(**5**);**

**BEGIN**

ConfirmedCSV **:=** UTL\_FILE**.**FOPEN **(**'MY\_DIRECTORY'**,** 'c:\dsda\_mid\_it17167710\covid\_Confirmed.CSV'**,** 'R'**);**

DeathsCSV **:=** UTL\_FILE**.**FOPEN **(**'MY\_DIRECTORY'**,** 'c:\dsda\_mid\_it17167710\covid\_Deaths.CSV'**,** 'R'**);**

RecoveredCSV **:=** UTL\_FILE**.**FOPEN **(**'MY\_DIRECTORY'**,** 'c:\dsda\_mid\_it17167710\covid\_Recovered.CSV'**,** 'R'**);**

i**:=**0**;**

**row:=**0**;**

**IF** UTL\_FILE**.**IS\_OPEN**(**ConfirmedCSV**)** **AND** UTL\_FILE**.**IS\_OPEN**(**DeathsCSV**)** **AND** UTL\_FILE**.**IS\_OPEN**(**RecoveredCSV**)** **THEN**

**LOOP**

**BEGIN**

i**:=**i+1**;**

UTL\_FILE**.**GET\_LINE**(**ConfirmedCSV**,** covid\_LINE\_C**,** 2000**);**

UTL\_FILE**.**GET\_LINE**(**DeathsCSV**,** covid\_LINE\_D**,** 2000**);**

UTL\_FILE**.**GET\_LINE**(**RecoveredCSV**,** covid\_LINE\_R**,** 2000**);**

**IF** i **=**1 **THEN**

**CONTINUE;**

**END** **IF;**

**IF** covid\_LINE\_C **IS** **NULL** **THEN**

**EXIT;**

**END** **IF;**

i **:=**5**;**

covid\_state **:=** **replace(**REGEXP\_SUBSTR**(**covid\_LINE\_C**,** '("([^"]\*)")|[^,]+'**,** 1**,** 1**),**'"'**,**''**);**

covid\_region **:=** REGEXP\_SUBSTR**(**covid\_LINE\_C**,** '("([^"]\*)")|[^,]+'**,** 1**,** 2**);**

covid\_lat **:=** REGEXP\_SUBSTR**(**covid\_LINE\_C**,** '("([^"]\*)")|[^,]+'**,** 1**,** 3**);**

covid\_long **:=** REGEXP\_SUBSTR**(**covid\_LINE\_C**,** '("([^"]\*)")|[^,]+'**,** 1**,** 4**);**

**INSERT** **INTO** countries\_tlb **VALUES(**0**,**covid\_region**,**covid\_state**,**covid\_lat**,**covid\_long**);**

**COMMIT;**

**row** **:=row**+1**;**

WIRTE\_FILE **:=** UTL\_FILE**.**FOPEN **(**'MY\_DIRECTORY'**,**'c:\dsda\_mid\_it17167710\covid\_dates.CSV'**,** 'R'**,**2000**);**

**IF** UTL\_FILE**.**IS\_OPEN**(**WIRTE\_FILE**)** **THEN**

**LOOP**

**BEGIN**

UTL\_FILE**.**GET\_LINE**(**WIRTE\_FILE**,** covid\_LINE2**,** 100**);**

**IF** covid\_LINE2 **IS** **NULL** **THEN**

UTL\_FILE**.**FCLOSE**(**WIRTE\_FILE**);**

**EXIT;**

**END** **IF;**

covid\_date **:=** REGEXP\_SUBSTR**(**covid\_LINE2**,** '("([^"]\*)")|[^,]+'**,** 1**,** 1**);**

covid\_Confirmed **:=** REGEXP\_SUBSTR**(**covid\_LINE\_C**,** '("([^"]\*)")|[^,]+'**,** 1**,** i**);**

covid\_Deaths **:=** REGEXP\_SUBSTR**(**covid\_LINE\_D**,** '("([^"]\*)")|[^,]+'**,** 1**,** i**);**

covid\_Recoverd **:=** REGEXP\_SUBSTR**(**covid\_LINE\_R**,** '("([^"]\*)")|[^,]+'**,** 1**,** i**);**

**INSERT** **INTO** panademic\_info **values((select** **ref(**c**)** **from** countries\_tlb c **where** c**.**countryid**=row)** **,** covid\_date **,** covid\_Confirmed**,**covid\_Recoverd**,**covid\_Deaths**);**

**COMMIT;**

i**:=**i+1**;**

**END;**

**END** **LOOP;**

**END** **IF;**

**EXCEPTION**

**WHEN** NO\_DATA\_FOUND **THEN**

**EXIT;**

**END;**

**END** **LOOP;**

**END** **IF;**

**IF** UTL\_FILE**.**is\_open**(**WIRTE\_FILE**)** **THEN**

UTL\_FILE**.**fclose**(**WIRTE\_FILE**);**

**END** **IF;**

UTL\_FILE**.**FCLOSE**(**ConfirmedCSV**);**

UTL\_FILE**.**FCLOSE**(**DeathsCSV**);**

UTL\_FILE**.**FCLOSE**(**RecoveredCSV**);**

**END;**

**/**

**Member methods**

* **MEMBER FUNCTION 1: calculate the number of non-recovered patient**

X = number of non-recovered patient

X = **Confirmed patients - Recovered patients - Died patients**

* **MEMBER FUNCTION 2: calculate the number Mortality Rate**

The case fatality rate

**ALTER** **TYPE** panademic\_info\_t

**ADD** MEMBER **FUNCTION** numberOf\_non\_recover

**RETURN** NUMBER **CASCADE;**

**ALTER** **TYPE** panademic\_info\_t

**ADD** MEMBER **FUNCTION** covid\_mortality\_rate

**RETURN** FLOAT **CASCADE;**

**ALTER** **TYPE** panademic\_info\_t

**ADD** MEMBER **FUNCTION** non\_recover\_rate

**RETURN** FLOAT **CASCADE;**

**ALTER** **TYPE** panademic\_info\_t

**ADD** MEMBER **FUNCTION** covid\_recoverRate

**RETURN** FLOAT **CASCADE;**

**CREATE** **OR** **REPLACE** **TYPE** **BODY** panademic\_info\_t

**AS** MEMBER **FUNCTION**

numberOf\_non\_recover

**RETURN** NUMBER **IS**

**BEGIN**

**RETURN** SELF**.**no\_of\_covid\_confirmed **-**SELF**.**no\_of\_covid\_Recovered **-**SELF**.**no\_of\_covid\_deaths **;**

**END** numberOf\_non\_recover**;**

MEMBER **FUNCTION** covid\_mortality\_rate

**RETURN** FLOAT **IS**

confirmed NUMBER**;**

**BEGIN**

confirmed **:=**1**;**

**IF** self**.**no\_of\_covid\_confirmed **>**0 **THEN**

confirmed **:=**self**.**no\_of\_covid\_confirmed**;**

**END** **IF;**

**RETURN** **(**self**.**no\_of\_covid\_deaths **/**confirmed**)\***100**;**

**END** covid\_mortality\_rate**;**

MEMBER **FUNCTION** non\_recover\_rate

**RETURN** FLOAT **IS**

confirmed NUMBER**;**

x NUMBER**;**

**BEGIN**

confirmed **:=**1**;**

**IF** self**.**no\_of\_covid\_confirmed **>**0 **THEN**

confirmed **:=**self**.**no\_of\_covid\_confirmed**;**

**END** **IF;**

x**:=** SELF**.**no\_of\_covid\_confirmed **-**SELF**.**no\_of\_covid\_Recovered **-**SELF**.**no\_of\_covid\_deaths **;**

**RETURN** **(**x **/**confirmed**)\***100**;**

**END** non\_recover\_rate**;**

MEMBER **FUNCTION** covid\_recoverRate

**RETURN** FLOAT **IS**

confirmed NUMBER**;**

**BEGIN**

confirmed **:=**1**;**

**IF** self**.**no\_of\_covid\_confirmed **>**0 **THEN**

confirmed **:=**self**.**no\_of\_covid\_confirmed**;**

**END** **IF;**

**RETURN** **(**self**.**no\_of\_covid\_Recovered **/**confirmed**)\***100**;**

**END** covid\_recoverRate**;**

**END;**

**SELECT** **DISTINCT** p**.**cid**.**country\_Region **AS** country**,**

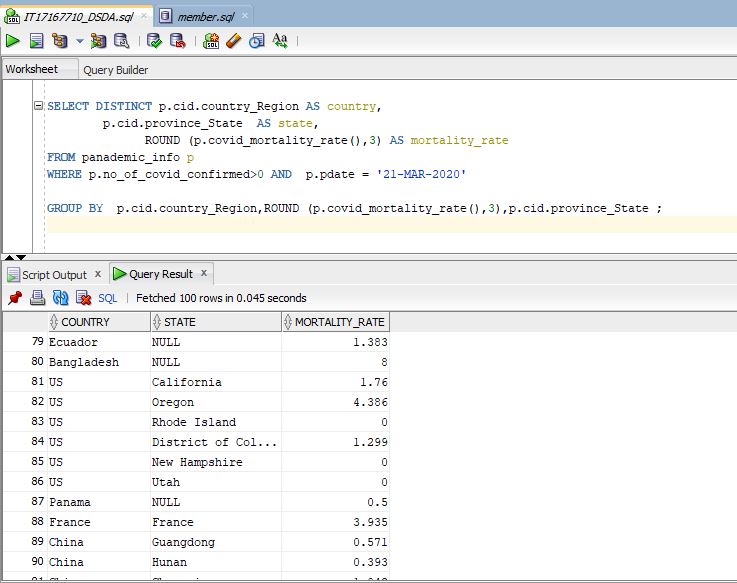
p**.**cid**.**province\_State **AS** **state,**

**ROUND** **(**p**.**covid\_mortality\_rate**(),**3**)** **AS** mortality\_rate

**FROM** panademic\_info p

**WHERE** p**.**no\_of\_covid\_confirmed**>**0 **AND** p**.**pdate **=** '21-MAR-2020'

**GROUP** **BY** p**.**cid**.**country\_Region**,ROUND(**p**.**covid\_mortality\_rate**(),**3**),**p**.**cid**.**province\_State **;**

****

**SELECT** p**.**cid**.**country\_Region **AS** country **,**

p**.**cid**.**province\_State **AS** **State** **,**

**SUM(**p**.**no\_of\_covid\_Recovered **)AS** total\_Recovered**,**

**SUM(**p**.**no\_of\_covid\_deaths**)AS** total\_DEATH**,**

**sum(**p**.**no\_of\_covid\_confirmed**)AS** total\_confirmed

**FROM**

panademic\_info p

**WHERE**

p**.**pdate **=** '21-MAR-2020' **AND**

p**.**no\_of\_covid\_confirmed **IN**

**(SELECT** **sum(**p**.**no\_of\_covid\_confirmed**)**

**from** panademic\_info p

**group** **by** p**.**no\_of\_covid\_confirmed

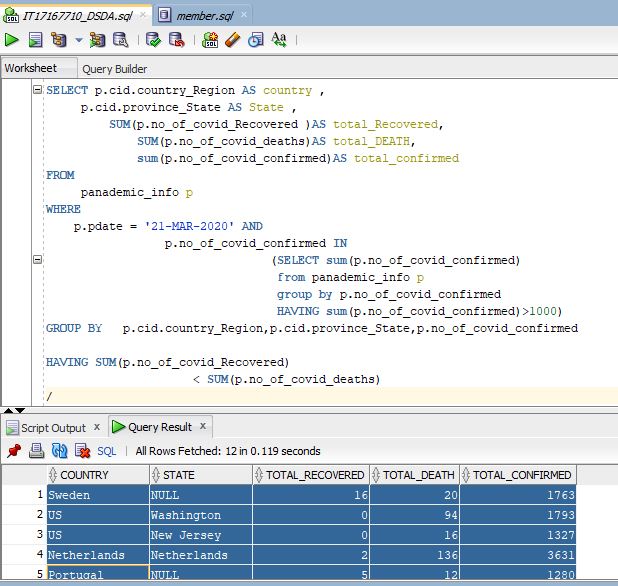
**HAVING** **sum(**p**.**no\_of\_covid\_confirmed**)>**1000**)**

**GROUP** **BY** p**.**cid**.**country\_Region**,**p**.**cid**.**province\_State**,**p**.**no\_of\_covid\_confirmed

**HAVING** **SUM(**p**.**no\_of\_covid\_Recovered**)**

**<** **SUM(**p**.**no\_of\_covid\_deaths**)**

**/**



**SELECT**

p**.**cid**.**country\_Region **AS** country**,**

p**.**cid**.**province\_State **AS** **state,**

**SUM(**p**.**no\_of\_covid\_confirmed**)AS** total\_confirmed**,**

**SUM(**p**.**no\_of\_covid\_Recovered**)** **AS** total\_Recovered**,**

**ROUND(** p**.**covid\_recoverRate**(),**3**)AS** Recovery\_Rate**,**

**SUM(**p**.**no\_of\_covid\_deaths**)** **AS** total\_DEATH**,**

**ROUND(** p**.**covid\_mortality\_rate**(),**3**)** **AS** mortality\_rate

**FROM**

panademic\_info p

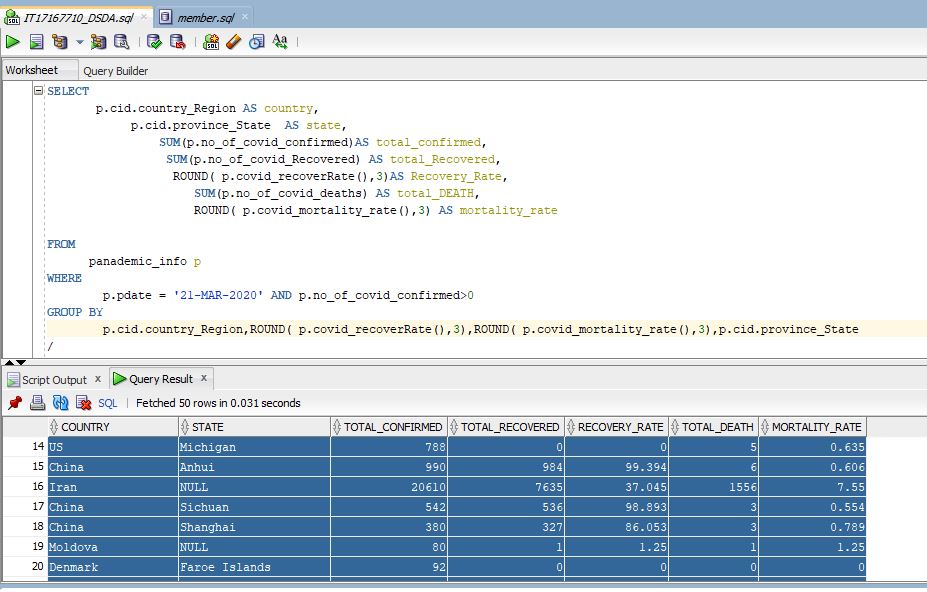
**WHERE**

p**.**pdate **=** '21-MAR-2020' **AND** p**.**no\_of\_covid\_confirmed**>**0

**GROUP** **BY**

p**.**cid**.**country\_Region**,ROUND(** p**.**covid\_recoverRate**(),**3**),ROUND(** p**.**covid\_mortality\_rate**(),**3**),**p**.**cid**.**province\_State

**/**



**SELECT**

p**.**cid**.**province\_State **AS** **State** **,**

**SUM(**p**.**no\_of\_covid\_deaths**)AS** total\_DEATH**,**

**SUM(**p**.**no\_of\_covid\_Recovered **)AS** total\_Recovered**,**

**sum(**p**.**no\_of\_covid\_confirmed**)AS** total\_confirmed

**FROM** panademic\_info p

**WHERE** p**.**pdate **=** '21-MAR-2020' **AND** p**.**cid**.**country\_Region **=**'US'

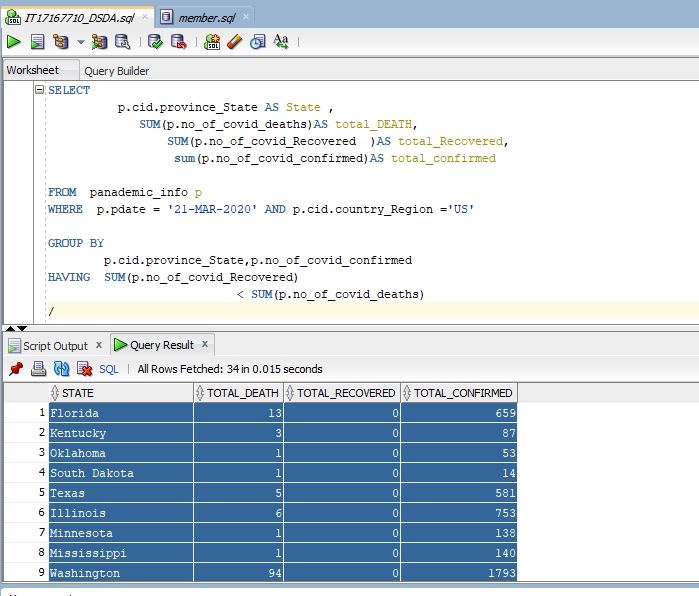
**GROUP** **BY**

p**.**cid**.**province\_State**,**p**.**no\_of\_covid\_confirmed

**HAVING** **SUM(**p**.**no\_of\_covid\_Recovered**)**

**<** **SUM(**p**.**no\_of\_covid\_deaths**)**

**/**



**SELECT**

p**.**cid**.**country\_Region **AS** country**,**

**SUM(**p**.**no\_of\_covid\_confirmed**)** **AS** confirmed\_patients**,**

**SUM(**p**.**no\_of\_covid\_Recovered**)** **AS** Recovered\_patients**,**

**SUM(**p**.**no\_of\_covid\_deaths**)AS** died\_patients**,**

p**.**numberOf\_non\_recover**()** **AS** Not\_recoverd\_patients**,**

p**.**cid**.**latitude **AS** latitude**,**

p**.**cid**.**longtude **as** longtude

**FROM** panademic\_info p

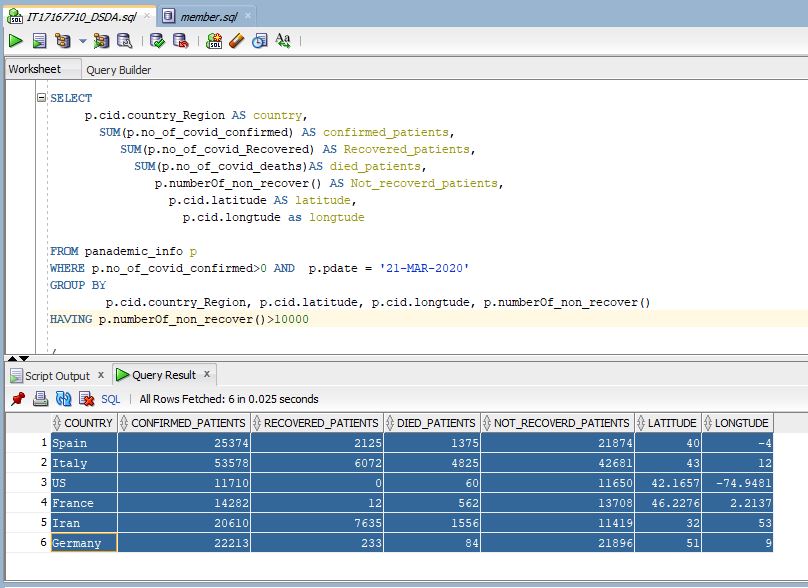
**WHERE** p**.**no\_of\_covid\_confirmed**>**0 **AND** p**.**pdate **=** '21-MAR-2020'

**GROUP** **BY**

p**.**cid**.**country\_Region**,** p**.**cid**.**latitude**,** p**.**cid**.**longtude**,** p**.**numberOf\_non\_recover**()**

**HAVING** p**.**numberOf\_non\_recover**()>**10000

**/**



**SELECT**

p**.**cid**.**country\_Region **AS** country**,**

**SUM(**p**.**no\_of\_covid\_confirmed**)** **AS** confirmed\_patients**,**

**SUM(**p**.**no\_of\_covid\_Recovered**)** **AS** Recovered\_patients**,**

**SUM(**p**.**no\_of\_covid\_deaths**)AS** died\_patients**,**

**SUM(**p**.**numberOf\_non\_recover**())AS** not\_Recovered\_patients

**FROM** panademic\_info p

**WHERE**

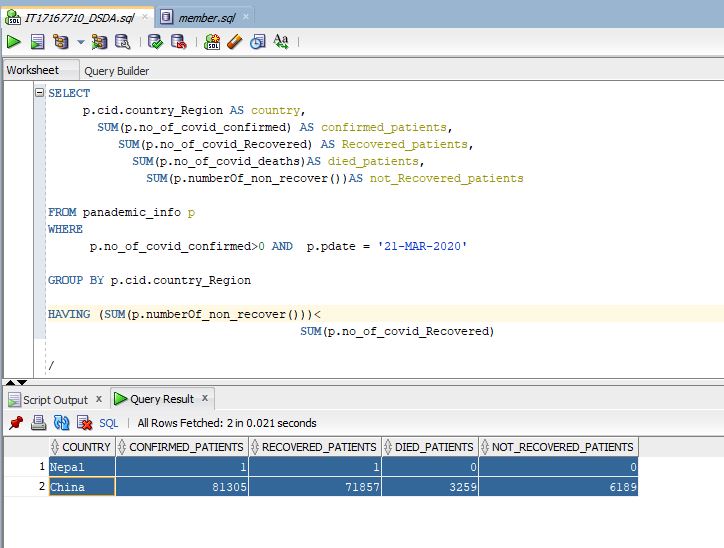
p**.**no\_of\_covid\_confirmed**>**0 **AND** p**.**pdate **=** '21-MAR-2020'

**GROUP** **BY** p**.**cid**.**country\_Region

**HAVING** **(SUM(**p**.**numberOf\_non\_recover**()))<**

**SUM(**p**.**no\_of\_covid\_Recovered**)**

**/**



**SELECT** p**.**cid**.**country\_Region **AS** country**,**

**SUM(**p**.**no\_of\_covid\_confirmed**)** **AS** confirmed\_patients**,**

**ROUND** **(** **AVG(**p**.**no\_of\_covid\_Recovered**),**2**)** **AS** Avarage\_Recovered\_patients**,**

**ROUND** **(** **AVG(**p**.**no\_of\_covid\_deaths**),**2**)** **AS** Avarage\_died\_patients**,**

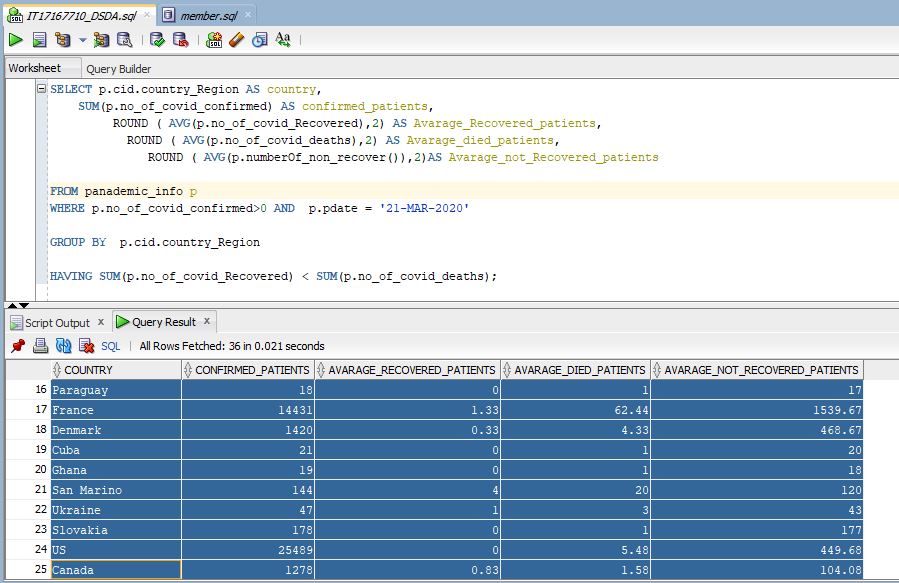
**ROUND** **(** **AVG(**p**.**numberOf\_non\_recover**()),**2**)AS** Avarage\_not\_Recovered\_patients

**FROM** panademic\_info p

**WHERE** p**.**no\_of\_covid\_confirmed**>**0 **AND** p**.**pdate **=** '21-MAR-2020'

**GROUP** **BY** p**.**cid**.**country\_Region

**HAVING** **SUM(**p**.**no\_of\_covid\_Recovered**)** **<** **SUM(**p**.**no\_of\_covid\_deaths**);**



**SELECT** p**.**cid**.**country\_Region **AS** country**,**

**ROUND** **(**p**.**covid\_recoverRate**(),**3**)** **AS** Recovered\_patients\_rate**,**

**ROUND** **(** p**.**covid\_mortality\_rate**(),**3**)AS** rate\_mortality\_rate**,**

**ROUND** **(**p**.**non\_recover\_rate**(),**3**)** **AS** not\_Recovered\_patients\_rate

**FROM** panademic\_info p

**WHERE** p**.**no\_of\_covid\_confirmed**>**0 **AND** p**.**pdate **=** '21-MAR-2020'

**GROUP** **BY** p**.**cid**.**country\_Region**,** **ROUND** **(**p**.**covid\_recoverRate**(),**3**),** **ROUND** **(** p**.**covid\_mortality\_rate**(),**3**),** **ROUND** **(**p**.**non\_recover\_rate**(),**3**);**

