SPARK ASSIGNMENT 20.1

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https://docs.google.com/document/d/1csLBlMiEXs_hXWV2Z8VpBlrj_R6RoDQLlZUnA0uBTCk/edit

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Census data analysis

You can download the dataset from the below link

https://drive.google.com/open?id=0ByJLBTmJojjzWllGZFJFaXFVbU0

Due to the limitation of 22 elements for a map function, we are taking only 22 columns from the data set.

Here is the total dataset description

State~String,District~String,Persons~String,Males~int,Females~int,Growth_1991_2001~int,Rural~int,Urban~int,Scheduled_Caste_population~int,Percentage_SC_to_total~int,Number_of_households~int,Household_size_per_household~int,Sex_ratio_females_per_1000_males~int,Sex_ratio_0_6_years~int,Scheduled_Tribe_population~int,Percentage_to_total_population_ST~int,Persons_literate~int,Males_Literate~int,Females_Literate~int,Persons_literacy_rate~int,Males_Literatacy_Rate~int,Females_Literacy_Rate~int,Total_Educated~int,Data_without_level~int,Below_Primary~int,Primary~int,Middle~int,Matric_Higher_Secondary_Diploma~int,Graduate_and_Above~int,X0_4_years~int,X5_14_years~int,X15_59_years~int,X60_years_and_above_Incl_ANS~int,Total_workers~int,Main_workers~int,Marginal_workers~int,Non_workers~int,SC_1_Name~String,SC_1_Population~int,SC_2_Name~String,SC_2_Population~int,SC_3_Name~String,SC_3_Population~int,Religeon_1_Name~String,Religeon_1_Population~int,Religeon_2_Name~String,Religeon_2_Population~int,Religeon_3_Name~String,Religeon_3_Population~int,ST_1_Name~String,ST_1_Population~int,ST_2_Name~String,ST_2_Population~int,ST_3_Name~String,ST_3_Population~int,Imp_

Town_1_Name~String,Imp_Town_1_Population~int,Imp_Town_2_Name~String,Imp_Town_2_Population~int,Imp_Town_3_Name~String,Imp_Town_3_Population~int,Total_Inhabited_Villages~int,Drinking_water_facilities~int,Safe_Drinking_water~int,Electricity_Power_Supply~int,Electricity_domestic~int,Electricity_Agriculture~int,Primary_school~int,Middle_schools~int,Secondary_Sr_Secondary_schools~int,College~int,Medical_facility~int,Primary_Health_Centre~int,Primary_Health_Sub_Centre~int,Post_telegraph_and_telephone_facility~int,Bus_services~int,Paved_approach_road~int,Mud_approach_road~int,Permanent_House~int,Semi_permanent_House~int,Temporary_House~int

Here is what we are taking

"State","Persons","Males","Females","Growth_1991_2001","Rural","Urban","Scheduled_Caste_population","Percentage_SC_to_total","Number_of_households","Household_size_per_household","Sex_ratio_females_per_1000_males","Sex_ratio_0_6_years","Scheduled_Tribe_population","Percentage_to_total_population_ST","Persons_literate","Males_Literate","Females_Literate","Persons_literacy_rate","Males_Literatacy_Rate","Females_Literacy_Rate","Total_Educated"

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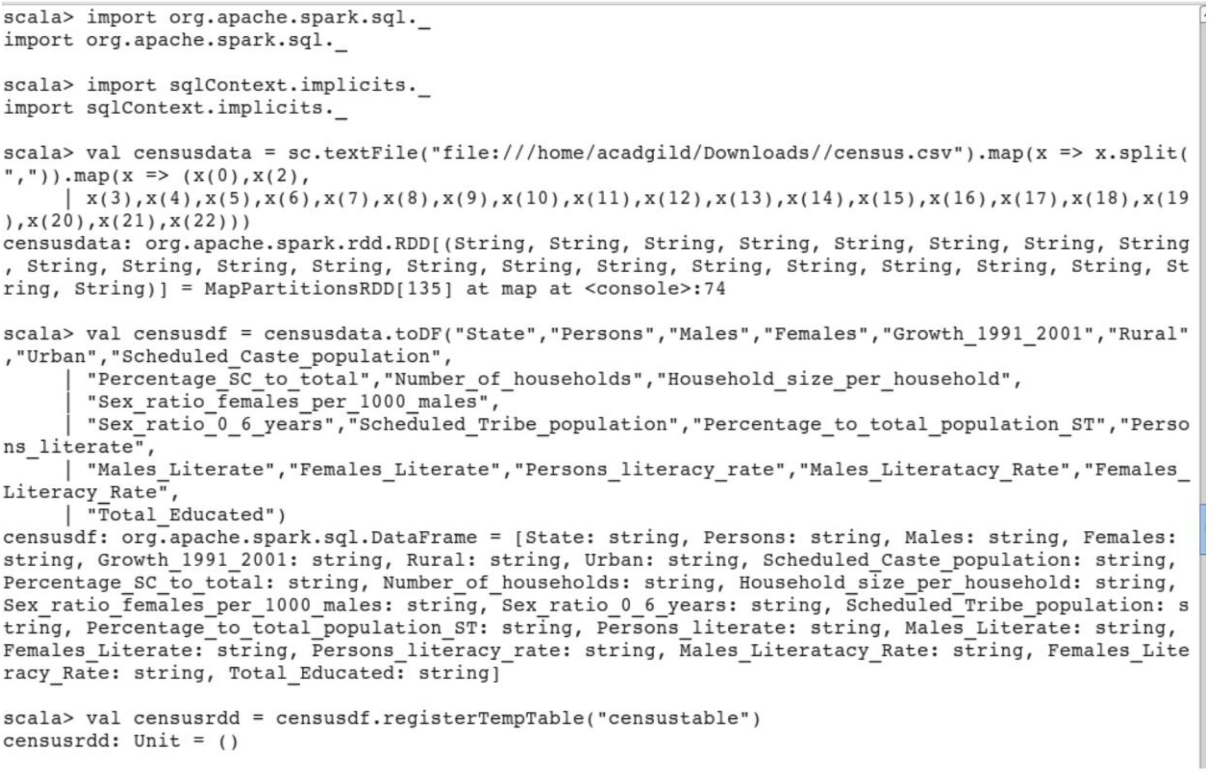
```
//Importing the SPARK SQL Packages

import org.apache.sqlContext.sql._

import sqlContext.implicits._

//Reading the CSV text into RDD and mapping the required columns to RDD

val censusdata =
sc.textFile("file:///home/acadgild/Downloads//census.csv").map(x => x.split(",")).map(x =>
(x(0),x(2),x(3),x(4),x(5),x(6),x(7),x(8),x(9),x(10),x(11),x(12),x(13),x(14),x(15),x(16),x(17),x(18),x(19),x(20),x(21),x(22)))
```

```
//Converting Data RDD into Dataframes with named columns

val censusdf =
censusdata.toDF("State","Persons","Males","Females","Growth_1991_2001","Rural","Urban","Scheduled_Caste_population",

"Percentage_SC_to_total","Number_of_households","Household_size_per_household",

"Sex_ratio_females_per_1000_males",

"Sex_ratio_0_6_years","Scheduled_Tribe_population","Percentage_to_total_population_ST","Persons_literate",

"Males_Literate","Females_Literate","Persons_literacy_rate","Males_Literatacy_Rate","Females_Literacy_Rate","Total_Educated")
```

```
//Creation of Dataframes into Temporary Table

val censusrdd =
censusdf.registerTempTable("censustable")
```

Screenshots:

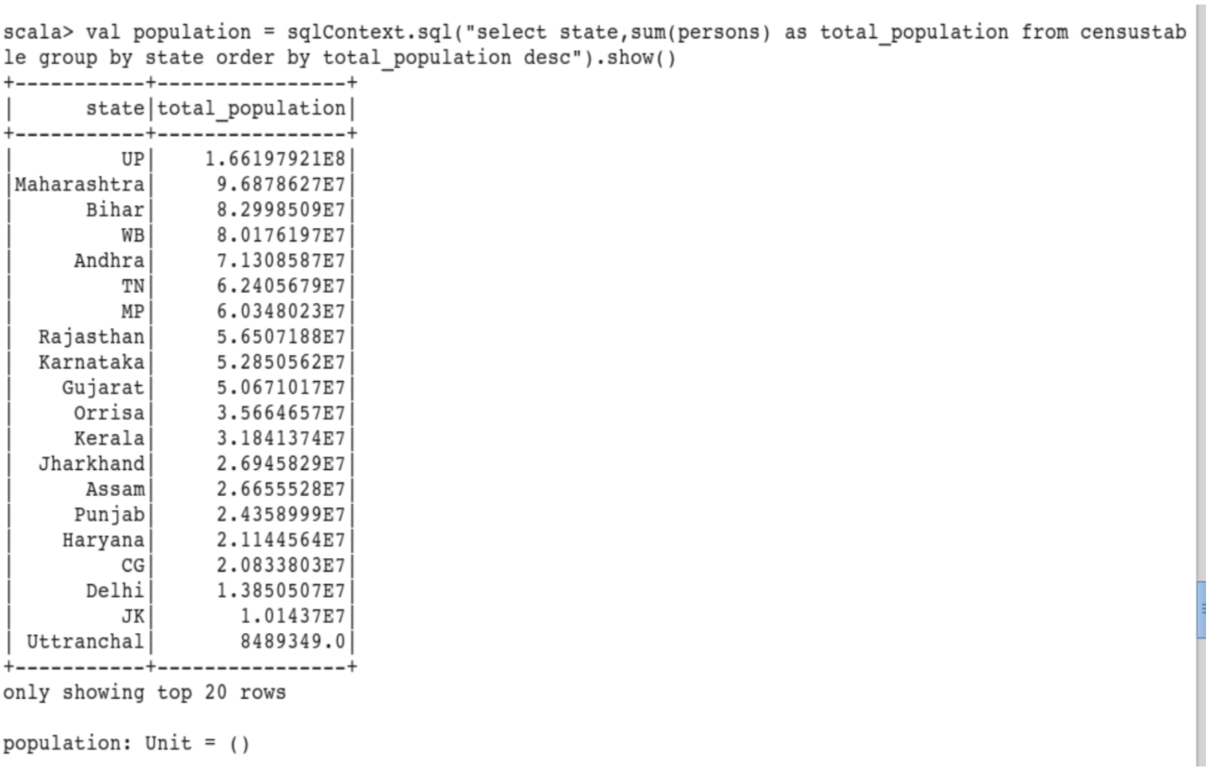


```
scala> import org.apache.spark.sql._
import org.apache.spark.sql._

scala> import sqlContext.implicits._
import sqlContext.implicits._

scala> val censusdata = sc.textFile("file:///home/acadgild/Downloads//census.csv").map(x => x.split(
",")).map(x => (x(0),x(2),
     | x(3),x(4),x(5),x(6),x(7),x(8),x(9),x(10),x(11),x(12),x(13),x(14),x(15),x(16),x(17),x(18),x(19
),x(20),x(21),x(22)))
censusdata: org.apache.spark.rdd.RDD[(String, String, String, String, String, String, String, String
, String, String, String, String, String, String, String, String, String, String, String, String, St
ring, String)] = MapPartitionsRDD[135] at map at <console>:74

scala> val censusdf = censusdata.toDF("State","Persons","Males","Females","Growth_1991_2001","Rural"
,"Urban","Scheduled_Caste_population",
     | "Percentage_SC_to_total","Number_of_households","Household_size_per_household",
     | "Sex_ratio_females_per_1000_males",
     | "Sex_ratio_0_6_years","Scheduled_Tribe_population","Percentage_to_total_population_ST","Perso
ns_literate",
     | "Males_Literate","Females_Literate","Persons_literacy_rate","Males_Literatacy_Rate","Females_
Literacy_Rate",
     | "Total_Educated")
censusdf: org.apache.spark.sql.DataFrame = [State: string, Persons: string, Males: string, Females:
string, Growth_1991_2001: string, Rural: string, Urban: string, Scheduled_Caste_population: string,
Percentage_SC_to_total: string, Number_of_households: string, Household_size_per_household: string,
Sex_ratio_females_per_1000_males: string, Sex_ratio_0_6_years: string, Scheduled_Tribe_population: s
tring, Percentage_to_total_population_ST: string, Persons_literate: string, Males_Literate: string,
Females_Literate: string, Persons_literacy_rate: string, Males_Literatacy_Rate: string, Females_Lite
racy_Rate: string, Total_Educated: string]

scala> val censusrdd = censusdf.registerTempTable("censustable")
censusrdd: Unit = ()
```

//1. Find out the state wise population and order by state

```
val population = sqlContext.sql("select
state,sum(persons) as total_population from
censustable group by state order by total_population
desc").show()
```

Screenshots:

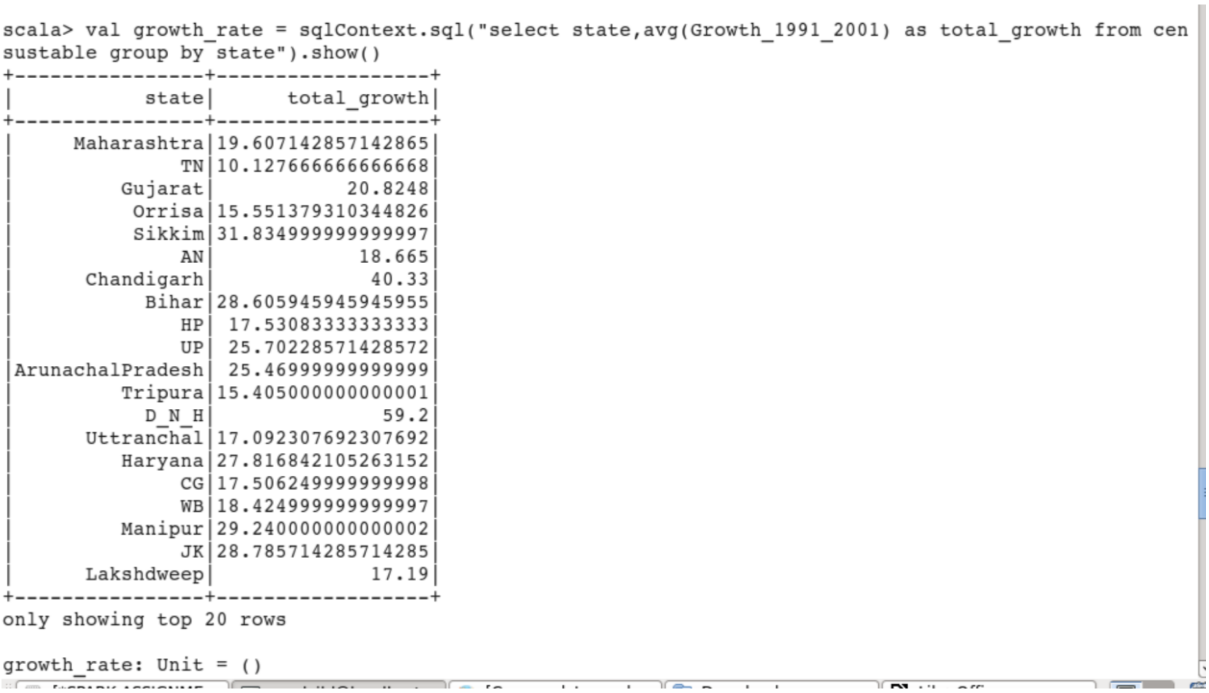


```
scala> val population = sqlContext.sql("select state,sum(persons) as total_population from censustab
le group by state order by total_population desc").show()
+-----------+----------------+
|      state|total_population|
+-----------+----------------+
|         UP|    1.66197921E8|
|Maharashtra|     9.6878627E7|
|      Bihar|     8.2998509E7|
|         WB|     8.0176197E7|
|     Andhra|     7.1308587E7|
|         TN|     6.2405679E7|
|         MP|     6.0348023E7|
|  Rajasthan|     5.6507188E7|
|  Karnataka|     5.2850562E7|
|    Gujarat|     5.0671017E7|
|     Orrisa|     3.5664657E7|
|     Kerala|     3.1841374E7|
|  Jharkhand|     2.6945829E7|
|      Assam|     2.6655528E7|
|     Punjab|     2.4358999E7|
|    Haryana|     2.1144564E7|
|         CG|     2.0833803E7|
|      Delhi|     1.3850507E7|
|         JK|       1.01437E7|
| Uttranchal|       8489349.0|
+-----------+----------------+
only showing top 20 rows

population: Unit = ()
```

//2. Find out the Growth Rate of Each State Between 1991-2001

```
val growth_rate = sqlContext.sql("select
state,avg(Growth_1991_2001) as total_growth from
censustable group by state").show()
```

Screenshots:

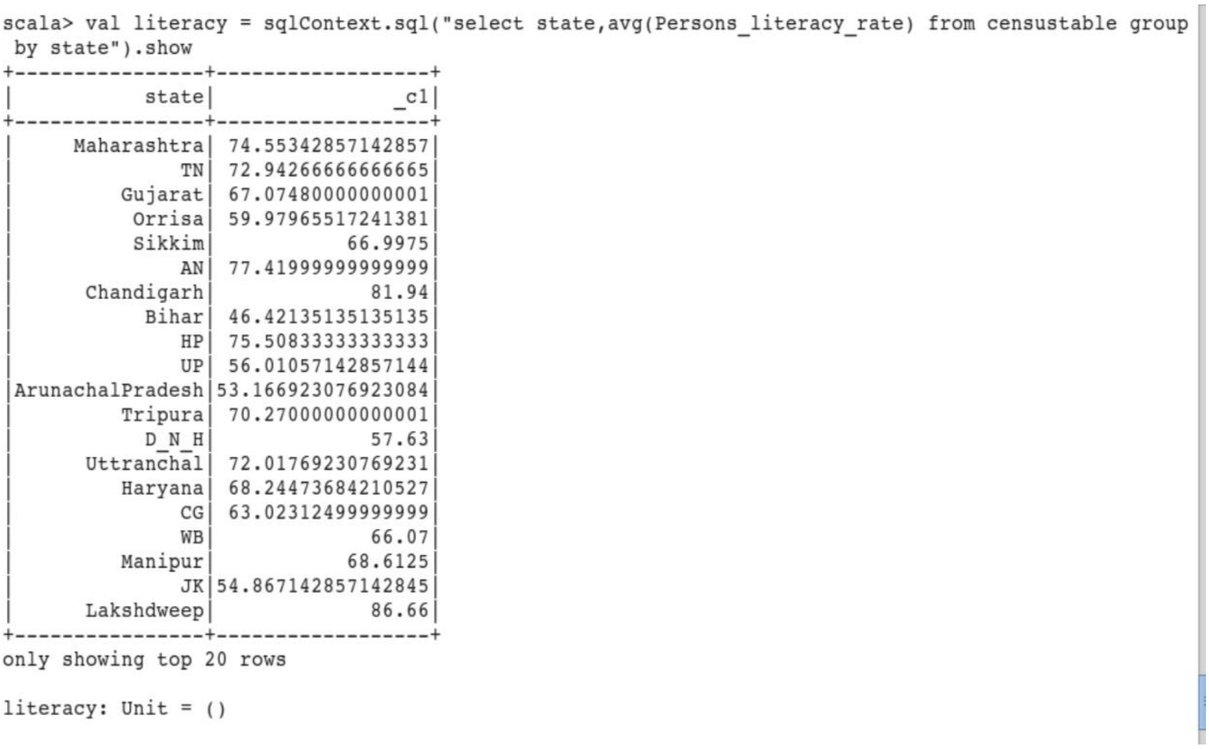


```
scala> val growth_rate = sqlContext.sql("select state,avg(Growth_1991_2001) as total_growth from cen
sustable group by state").show()
+----------------+------------------+
|           state|      total_growth|
+----------------+------------------+
|     Maharashtra|19.607142857142865|
|              TN|10.127666666666668|
|         Gujarat|           20.8248|
|          Orrisa|15.551379310344826|
|          Sikkim|31.834999999999997|
|              AN|            18.665|
|      Chandigarh|             40.33|
|           Bihar|28.605945945945955|
|              HP| 17.53083333333333|
|              UP| 25.70228571428572|
|ArunachalPradesh| 25.46999999999999|
|         Tripura|15.405000000000001|
|           D_N_H|              59.2|
|      Uttranchal|17.092307692307692|
|         Haryana|27.816842105263152|
|              CG|17.506249999999998|
|              WB|18.424999999999997|
|         Manipur|29.240000000000002|
|              JK|28.785714285714285|
|      Lakshdweep|             17.19|
+----------------+------------------+
only showing top 20 rows

growth_rate: Unit = ()
```

//3. Find the literacy rate of each state

```
val literacy = sqlContext.sql("select
state,avg(Persons_literacy_rate) from censustable
group by state").show()
```

Screenshots:

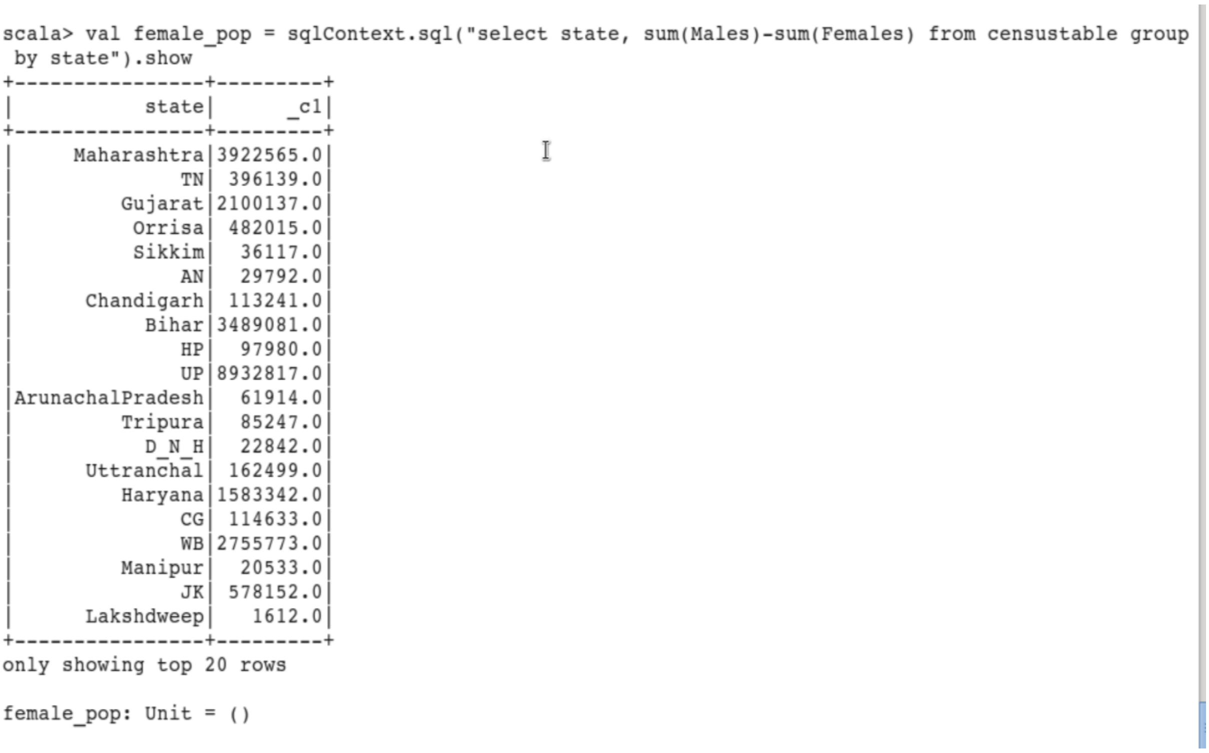


```
scala> val literacy = sqlContext.sql("select state,avg(Persons_literacy_rate) from censustable group
 by state").show
+----------------+------------------+
|           state|               _c1|
+----------------+------------------+
|     Maharashtra| 74.55342857142857|
|              TN| 72.94266666666665|
|         Gujarat| 67.07480000000001|
|          Orrisa| 59.97965517241381|
|          Sikkim|           66.9975|
|              AN| 77.41999999999999|
|      Chandigarh|             81.94|
|           Bihar| 46.42135135135135|
|              HP| 75.50833333333333|
|              UP| 56.01057142857144|
|ArunachalPradesh|53.166923076923084|
|         Tripura| 70.27000000000001|
|           D_N_H|             57.63|
|      Uttranchal| 72.01769230769231|
|         Haryana| 68.24473684210527|
|              CG| 63.02312499999999|
|              WB|             66.07|
|         Manipur|           68.6125|
|              JK|54.867142857142845|
|      Lakshdweep|             86.66|
+----------------+------------------+
only showing top 20 rows

literacy: Unit = ()
```

//4. Find out the States with More Female Population

```
val female_pop = sqlContext.sql("select state,
sum(Males)-sum(Females) from censustable group by
state").show()
```

Screenshots:

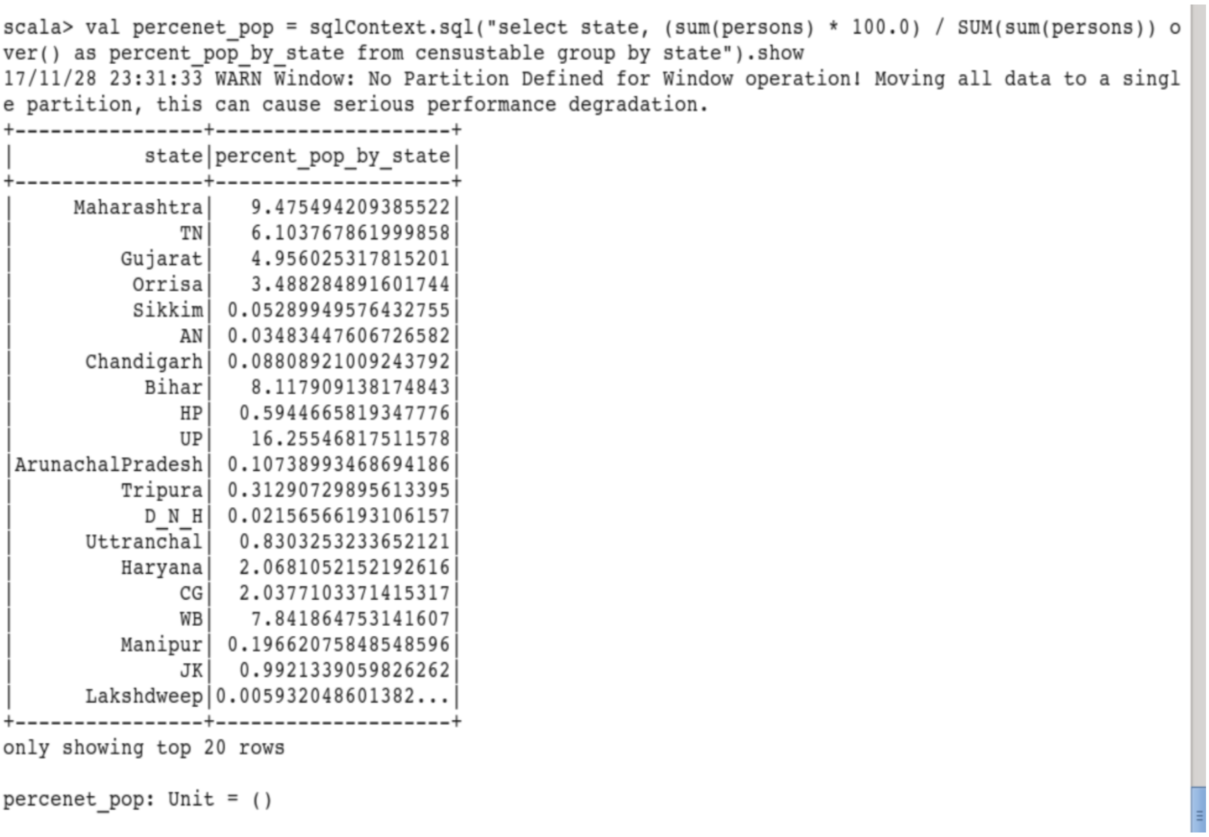


```
scala> val female_pop = sqlContext.sql("select state, sum(Males)-sum(Females) from censustable group
 by state").show
+----------------+---------+
|           state|      _c1|
+----------------+---------+
|     Maharashtra|3922565.0|
|              TN| 396139.0|
|         Gujarat|2100137.0|
|          Orrisa| 482015.0|
|          Sikkim|  36117.0|
|              AN|  29792.0|
|      Chandigarh| 113241.0|
|           Bihar|3489081.0|
|              HP|  97980.0|
|              UP|8932817.0|
|ArunachalPradesh|  61914.0|
|         Tripura|  85247.0|
|           D_N_H|  22842.0|
|      Uttranchal| 162499.0|
|         Haryana|1583342.0|
|              CG| 114633.0|
|              WB|2755773.0|
|         Manipur|  20533.0|
|              JK| 578152.0|
|      Lakshdweep|   1612.0|
+----------------+---------+
only showing top 20 rows

female_pop: Unit = ()
```

//5. Find out the Percentage of Population in Every State

```
val percenet_pop = sqlContext.sql("select state,
(sum(persons) * 100.0) / SUM(sum(persons)) over() as
percent_pop_by_state from censustable group by
state").show
```

Screenshots:



```
scala> val percenet_pop = sqlContext.sql("select state, (sum(persons) * 100.0) / SUM(sum(persons)) o
ver() as percent_pop_by_state from censustable group by state").show
17/11/28 23:31:33 WARN Window: No Partition Defined for Window operation! Moving all data to a singl
e partition, this can cause serious performance degradation.
+----------------+--------------------+
|           state|percent_pop_by_state|
+----------------+--------------------+
|     Maharashtra|   9.475494209385522|
|              TN|   6.103767861999858|
|         Gujarat|   4.956025317815201|
|          Orrisa|   3.488284891601744|
|          Sikkim| 0.05289949576432755|
|              AN| 0.03483447606726582|
|      Chandigarh| 0.08808921009243792|
|           Bihar|   8.117909138174843|
|              HP|  0.5944665819347776|
|              UP|   16.25546817511578|
|ArunachalPradesh| 0.10738993468694186|
|         Tripura| 0.31290729895613395|
|           D_N_H| 0.02156566193106157|
|      Uttranchal|  0.8303253233652121|
|         Haryana|  2.0681052152192616|
|              CG|  2.0377103371415317|
|              WB|   7.841864753141607|
|         Manipur| 0.19662075848548596|
|              JK|  0.9921339059826262|
|      Lakshdweep|0.005932048601382...|
+----------------+--------------------+
only showing top 20 rows

percenet_pop: Unit = ()
```