Assignment 22.1

Here we are going to work on Census Data.

Here is the total dataset description

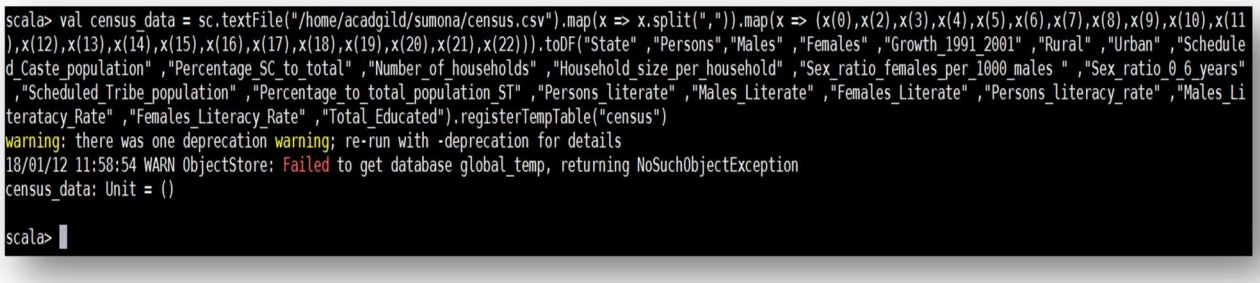
State String,District String,Persons String,Males int,Females int,Growth_1991_2001 int,Rural int,Urban int,Scheduled_Caste_population int,Percentage_SC_to_total int,Number_of_households int,Household_size_per_household int,Sex_ratio_females_per_1000_males int ,Sex_ratio_0_6_years int,Scheduled_Tribe_population 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

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

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"

```
val census_data = sc.textFile("/home/acadgild/sumona/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))).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").registerTempTable("census")
```



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

Code:

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

Output:

```
scala> val population = spark.sql("select state,sum(persons) as total_population from census 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 = ()

scala>
```

2. Find out the growth rate of each state between 1991-2001

Code:

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

Output:

```
scala> val growth_rate = spark.sql("select state,avg(Growth_1991_2001) as total_growth from census group by state").show
+---------------+-----------------+
|          state|      total_growth|
+---------------+-----------------+
|       Nagaland|          64.92375|
|      Karnataka|15.506666666666668|
|          D_N_H|             59.2|
|         Kerala| 9.354999999999999|
|         Punjab| 18.87705882352941|
|             CG|17.506249999999998|
|       Manipur|29.240000000000002|
|             HP| 17.53083333333333|
|            Goa|           15.045|
|       Mizoram| 30.64428571428571|
|        Orrisa|15.551379310344826|
|ArunachalPradesh| 25.46999999999999|
|       Meghalya| 32.81428571428571|
|             WB|18.424999999999997|
|        Haryana|27.816842105263152|
|      Jharkhand| 23.79666666666667|
|        Gujarat|           20.8248|
|             TN|10.127666666666668|
|         Andhra|14.571818181818184|
|             UP| 25.70228571428572|
+---------------+-----------------+
only showing top 20 rows

growth_rate: Unit = ()

scala>
```

3. Find the literacy rate of each state

Code:

val literacy = spark.sql("select state,avg(Persons_literacy_rate) from census group by state").show

Output:

```
scala> val literacy = spark.sql("select state,avg(Persons_literacy_rate) from census group by state").show
+---------------+----------------------------------------+
|          state|avg(CAST(Persons_literacy_rate AS DOUBLE))|
+---------------+----------------------------------------+
|       Nagaland|                                68.52875|
|      Karnataka|                       65.72666666666666|
|          D_N_H|                                   57.63|
|         Kerala|                       90.52285714285713|
|         Punjab|                       68.61176470588235|
|             CG|                       63.02312499999999|
|        Manipur|                                 68.6125|
|             HP|                       75.50833333333333|
|            Goa|                       81.78999999999999|
|        Mizoram|                       85.55375000000001|
|         Orrisa|                       59.97965517241381|
|ArunachalPradesh|                      53.166923076923084|
|       Meghalya|                       60.722857142857144|
|             WB|                                   66.07|
|        Haryana|                       68.24473684210527|
|      Jharkhand|                       50.51166666666667|
|        Gujarat|                       67.07480000000001|
|             TN|                       72.94266666666665|
|          Andhra|                      59.29363636363637|
|             UP|                       56.01057142857144|
+---------------+----------------------------------------+
only showing top 20 rows

literacy: Unit = ()

scala>
```

4. Find out the states with more Female population

Code:

val female_pop = spark.sql("select state, sum(Males)-sum(Females) from census group by state").show

Output:

```
scala> val female_pop = spark.sql("select state, sum(Males)-sum(Females) from census group by state").show
+---------------+-----------------------------------------------------------+
|          state|(sum(CAST(Males AS DOUBLE)) - sum(CAST(Females AS DOUBLE)))|
+---------------+-----------------------------------------------------------+
|       Nagaland|                                                   104246.0|
|      Karnataka|                                                   947274.0|
|          D_N_H|                                                    22842.0|
|         Kerala|                                                  -904146.0|
|         Punjab|                                                  1611091.0|
|             CG|                                                   114633.0|
|        Manipur|                                                    20533.0|
|             HP|                                                    97980.0|
|            Goa|                                                    26828.0|
|        Mizoram|                                                    29645.0|
|         Orrisa|                                                   482015.0|
|ArunachalPradesh|                                                   61914.0|
|       Meghalya|                                                    33352.0|
|             WB|                                                  2755773.0|
|        Haryana|                                                  1583342.0|
|      Jharkhand|                                                   824245.0|
|        Gujarat|                                                  2100137.0|
|             TN|                                                   396139.0|
|         Andhra|                                                   826959.0|
|             UP|                                                  8932817.0|
+---------------+-----------------------------------------------------------+
only showing top 20 rows

female_pop: Unit = ()

scala>
```

5. Find out the percentage of population in every state

Code:

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

Output:

```
scala> val percenet_pop = spark.sql("select state, (sum(persons) * 100.0) / SUM(sum(persons)) over() as percent_pop_by_state from census group by state").show
18/01/12 12:26:24 WARN WindowExec: No Partition Defined for Window operation! Moving all data to a single partition, this can cause serious performance degradati
on.
+---------------+-------------------+
|          state|percent_pop_by_state|
+---------------+-------------------+
|       Nagaland| 0.19464122457545488|
|      Karnataka|   5.169202018044398|
|          D_N_H| 0.02156566193106157|
|         Kerala|  3.1143376439044568|
|         Punjab|  2.3825023239741796|
|             CG|  2.0377103371415317|
|        Manipur| 0.19662075848548596|
|             HP|  0.5944665819347776|
|            Goa| 0.13181256512000492|
|        Mizoram| 0.08690945130876308|
|         Orrisa|   3.488284891601744|
|ArunachalPradesh| 0.10738993468694186|
|       Meghalya| 0.22679908989209513|
|             WB|   7.841864753141607|
|        Haryana|  2.0681052152192616|
|      Jharkhand|  2.6355147111714583|
|        Gujarat|   4.956025317815201|
|             TN|   6.103767861999858|
|         Andhra|   6.974542519042551|
|             UP|   16.25546817511578|
+---------------+-------------------+
only showing top 20 rows

percenet_pop: Unit = ()

scala>
```