

Screenshots of Spark-SQL-Query Results

```
scala> spark.time {
  |   val result = spark.sql("SELECT Year, avg((LateAircraftDelay /ArrDelay)*100) from delay_flight GROUP BY Year").show()
  | }
+-----+-----+
|Year|avg(((CAST(LateAircraftDelay AS DOUBLE) / CAST(ArrDelay AS DOUBLE)) * CAST(100 AS DOUBLE)))|
+-----+-----+
|2010|41.331052610239794|
|2003|37.924225963706164|
|2005|49.490838422749654|
|2009|33.585314999939314|
|2006|46.838787224801735|
|2004|31.662176952308105|
|2008|37.22555555408794|
|2007|45.252432744291134|
+-----+-----+

Time taken: 504 ms
```

```
scala> spark.time {
  |   val result = spark.sql("SELECT Year, avg((WeatherDelay /ArrDelay)*100) from delay_flight GROUP BY Year").show()
  | }
+-----+-----+
|Year|avg(((CAST(WeatherDelay AS DOUBLE) / CAST(ArrDelay AS DOUBLE)) * CAST(100 AS DOUBLE)))|
+-----+-----+
|2010|2.9023312955584664|
|2003|7.8319479664511205|
|2005|5.85069715149616|
|2009|0.45316615137982363|
|2006|4.588604183967953|
|2004|6.4475279976916555|
|2008|3.7254490054008955|
|2007|4.042975783210287|
+-----+-----+

Time taken: 480 ms
```

```
scala> spark.time {
  |   val result = spark.sql("SELECT Year, avg((NASDelay /ArrDelay)*100) from delay_flight GROUP BY Year").show()
  | }
+-----+-----+
|Year|avg(((CAST(NASDelay AS DOUBLE) / CAST(ArrDelay AS DOUBLE)) * CAST(100 AS DOUBLE)))|
+-----+-----+
|2010|33.87351363404217|
|2003|29.686276314267346|
|2005|16.63868805373129|
|2009|37.63093330628511|
|2006|18.119312329937703|
|2004|18.24570061769958|
|2008|30.16552562594132|
|2007|30.625925917941924|
+-----+-----+

Time taken: 514 ms
```

```
scala> spark.time {
  |   val result = spark.sql("SELECT Year, avg((CarrierDelay /ArrDelay)*100) from delay_flight GROUP BY Year").show()
  | }
+-----+-----+
|Year|avg(((CAST(CarrierDelay AS DOUBLE) / CAST(ArrDelay AS DOUBLE)) * CAST(100 AS DOUBLE)))|
+-----+-----+
|2010|21.89310246015957|
|2003|24.557549755575373|
|2005|28.01977637202288|
|2009|28.33058554239575|
|2006|30.453296261292596|
|2004|43.64459443230066|
|2008|28.88346981456985|
|2007|19.850007017971283|
+-----+-----+

Time taken: 7094 ms
```

```
scala> spark.time {
  |   val result = spark.sql("SELECT Year, avg((SecurityDelay /ArrDelay)*100) from delay_flight GROUP BY Year").show()
  | }
+-----+-----+
|Year|avg(((CAST(SecurityDelay AS DOUBLE) / CAST(ArrDelay AS DOUBLE)) * CAST(100 AS DOUBLE)))|
+-----+-----+
|2010|0.0|
|2003|0.0|
|2005|0.0|
|2009|0.0|
|2006|0.0|
|2004|0.0|
|2008|0.0|
|2007|0.22865853658536586|
+-----+-----+

Time taken: 453 ms
```