2017-01-19-Zeppelin-Getting-Started Untitled Untitled Untitled Untitled Untitled

Zeppelin

2017-01-19-Zeppeli...

default

FINISHED

```
// Imports
import org.apache.spark.sql.functions._
import org.joda.time.format.DateTimeFormat

// Load data - adjust the path to the location of your data
val inputPath =  "/Users/Hamster/Desktop/Air_Flight_Data/*"
val airTraffic = sqlContext.read
        .format("com.databricks.spark.csv")
        .option("header", "true") // Use first line of all files as header
        .option("delimiter", ",")
        .option("inferSchema", "true") // Automatically infer data types
        .load(inputPath)

// Add extra features
val calcDayOfYear = udf(
    (dayOfMonth: Int, month: Int, year: Int) => {
        val dateFormat = DateTimeFormat.forPattern("dd/MM/yyyy")
        dateFormat.parseDateTime(s"$dayOfMonth/$month/$year").getDayOfYear()
    }
)
val calcRoute = udf(
    (origin: String, dest: String) => s"$origin - $dest"
)
val calcHourOfArrival = udf(
    (arrTime: String) => arrTime.slice(0,arrTime.size-2)
)
val featuredTraffic = airTraffic
    .withColumn("DayOfYear", calcDayOfYear(airTraffic("DayOfMonth"), airTraffic("Month"), air
    .withColumn("HourOfArr", calcHourOfArrival(airTraffic("ArrTime")))
    .withColumn("Route", calcRoute(airTraffic("Origin"), airTraffic("Dest")))

// Register as Spark SQL Table
featuredTraffic.registerTempTable("air_traffic")
// sqlContext.cacheTable("air_traffic")
```

```
import org.apache.spark.sql.functions._
import org.joda.time.format.DateTimeFormat
inputPath: String = /Users/Hamster/Desktop/Air_Flight_Data/*
airTraffic: org.apache.spark.sql.DataFrame = [Year: int, Month: int ... 27 more fields]
warning: Class org.joda.convert.FromString not found - continuing with a stub.
warning: Class org.joda.convert.ToString not found - continuing with a stub.
warning: Class org.joda.convert.ToString not found - continuing with a stub.
calcDayOfYear: org.apache.spark.sql.expressions.UserDefinedFunction = UserDefinedFunction(<fun
ction3>,IntegerType,Some(List(IntegerType, IntegerType, IntegerType)))
calcRoute: org.apache.spark.sql.expressions.UserDefinedFunction = UserDefinedFunction(<functio
n2>,StringType,Some(List(StringType, StringType)))
calcHourOfArrival: org.apache.spark.sql.expressions.UserDefinedFunction = UserDefinedFunction
(<function1>,StringType,Some(List(StringType)))
featuredTraffic: org.apache.spark.sql.DataFrame = [Year: int, Month: int ... 30 more fields]
warning: there was one deprecation warning; re-run with -deprecation for details
```

Took 1 min 50 sec. Last updated by anonymous at January 21 2017, 2:17:20 PM.

2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started Untitled Untitled Untitled Untitled Untitled

Zeppelin

2017-01-19-Zeppeli...

```
%sql
select DayOfYear, count(*) as NrOfFlights, avg(DepDelay) as AvgDepDelay, avg(ArrDelay) as Avg
```

FINISHED

default

DayOfYear	NrOfFlights	AvgD
148	325,680	5.984
243	334,157	6.481
31	333,830	6.776
85	336,519	7.227
137	335,712	8.402
251	334,225	4.094
65	338,508	9.012
53	336,107	11.65
255	336,123	4.813

Took 1 min 46 sec. Last updated by anonymous at January 21 2017, 2:19:14 PM. (outdated)

FINISHED

```
%sql
select HourOfArr, count(*) as NrFlights, avg(ArrDelay) as AvgArrDelay from air_traffic where I
)} and Origin = "${org=ATL,ATL|PHX|PIT}" group by HourOfArr
```

org

day

HourOfArr	NrFlights
7	11,978
15	51,476
11	61,006
3	227
8	29,101
22	56,236

2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started Untitled Untitled Untitled Untitled Untitled

Zeppelin

28 3

Took 1 min 1 sec. Last updated by anonymous at January 21 2017, 2:20:26 PM. (outdated)

2017-01-19-Zeppelin...

default

FINISHED

```
%pyspark
# helper function to display in Zeppelin

import StringIO
def show(p):
  img = StringIO.StringIO()
  p.savefig(img, format='svg')
  img.seek(0)
  print "%html " + img.buf
```

Took 0 sec. Last updated by anonymous at January 21 2017, 2:20:34 PM.

FINISHED

```
%pyspark
import matplotlib.pyplot as plt

#define some data
x = [1,2,3,4]
y = [20, 21, 20.5, 20.8]

#plot data
plt.plot(x, y, linestyle="dashed", marker="o", color="green")
```

```
[<matplotlib.lines.Line2D object at 0x1115d18d0>]
```

Took 0 sec. Last updated by anonymous at January 21 2017, 2:20:36 PM.

FINISHED

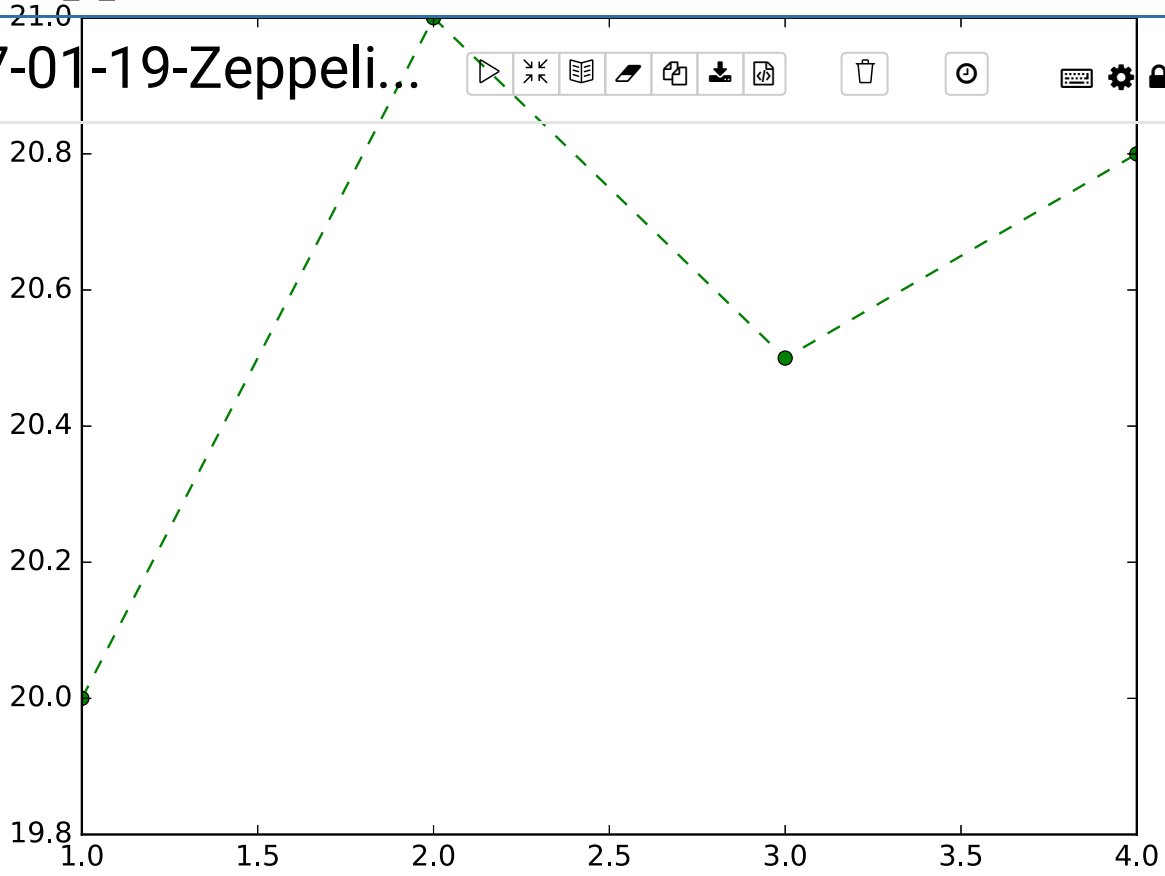
```
%pyspark
show(plt)
```

2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started Untitled Untitled Untitled Untitled Untitled

Zeppelin

2017-01-19-Zeppeli...



Took 0 sec. Last updated by anonymous at January 21 2017, 2:20:45 PM.

FINISHED

```
%pyspark
import matplotlib
import matplotlib.pyplot as plt
import seaborn as sns

import StringIO
def show(p):
  img = StringIO.StringIO()
  p.savefig(img, format='svg')
  img.seek(0)
  print "%html " + img.buf

df = sqlContext.sql("SELECT Dest, Month, count(*) as NrOfFlights, avg(ArrDelay) as AvgArrDelay
data = df.toPandas()

value = "AvgArrDelay"
x = "Dest"
grouping = ["Month"]

heatmap_data = data.pivot_table(values=value, index=x, columns=grouping)
heatmap_data = heatmap_data[0:100]

a4_dims = (len(heatmap_data.columns),50)
fig, ax = plt.subplots(figsize=a4_dims)
ax.set_title("Avg Arrival Delay")
```

2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started

Untitled Untitled Untitled Untitled Untitled

```
sns.heatmap(heatmap_data, cbar=False, annot=True, fmt="d")
```

Zeppelin

2017-01-19-Zeppeli...

default

2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started Untitled Untitled Untitled Untitled Untitled

Zeppelin

2017-01-19-Zeppeli... default

2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started

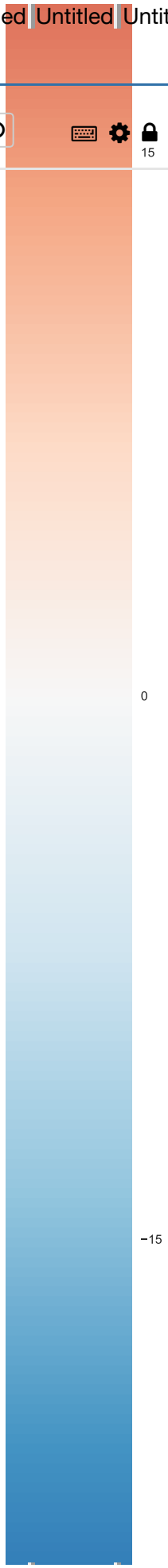
Zeppelin

2017-01-19-Zeppeli

Untitled Untitled Untitled Untitled Untitled

default

Dest	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled	Untitled
BGM	7.42	6.83	5.78	3.94	5.35	9.47	7.69	8.05	4.49	3.10	3.78	8.94
BGR	11.80	10.68	10.93	8.98	9.84	14.66	14.22	13.33	5.67	5.15	5.34	12.70
BHM	6.81	6.39	6.37	4.92	5.87	9.67	9.23	6.84	3.05	4.36	4.76	9.17
BIL	8.11	6.94	5.99	2.65	2.98	7.33	8.04	6.18	2.41	3.24	4.13	12.72
BIS	6.49	6.36	5.79	1.86	2.14	7.22	4.35	3.85	1.04	1.57	3.72	11.29
BJI						2.80	0.91	4.14	9.46	2.00	-7.00	
BLI	6.42	4.65	2.43	1.66	1.74	3.73	2.13	6.65	3.10	6.59	8.86	14.54
BMI	16.15	17.10	14.75	8.36	7.48	15.43	15.75	13.13	8.11	8.18	10.32	18.37
BNA	5.56	5.17	4.87	3.39	4.05	7.94	7.28	5.70	1.87	3.25	3.35	7.55
BOI	10.94	9.11	7.49	4.39	4.67	8.36	8.15	8.27	3.60	5.73	6.39	15.51
BOS	8.65	8.05	9.26	7.41	7.75	12.53	11.75	10.59	5.34	5.45	5.73	9.00
BPT	1.30	3.12	2.30	1.07	1.05	10.48	5.37	3.82	0.38	0.17	4.82	1.57
BQK	4.76	9.24	8.77	5.23	9.13	16.03	19.26	19.80	11.96	12.37	8.23	12.42
BQN	7.88	8.99	10.32	9.59	8.57	18.56	20.01	13.79	4.30	1.14	5.86	12.97
BRO	4.71	6.41	7.15	3.87	4.51	10.51	7.18	4.12	-1.51	3.87	5.68	9.56
BRW	7.83	9.27	7.81	2.73	7.54	9.46	12.64	13.26	5.55	5.49	6.13	11.71
BTM	10.29	5.82	4.87	1.16	0.26	4.33	2.74	2.78	-0.26	0.44	3.52	15.56
BTR	7.22	8.61	7.89	6.49	6.03	10.73	9.68	7.73	4.13	4.95	6.18	9.84
BTV	9.42	9.49	11.18	7.41	7.82	12.89	15.24	13.12	4.81	4.85	5.18	12.76
BUF	9.12	8.81	8.31	7.02	6.52	12.01	12.50	10.62	4.72	5.04	5.76	11.34
BUR	7.43	8.04	6.07	5.05	3.90	6.23	5.54	6.47	3.54	5.92	6.38	10.35
BWI	6.62	5.88	6.67	4.67	5.85	11.26	10.97	8.73	2.88	3.31	4.41	7.77
BZN	11.55	9.19	6.23	1.05	1.83	6.87	6.11	5.61	1.55	1.44	3.28	14.89
CAE	10.05	9.74	9.20	7.34	7.42	12.42	13.29	11.08	5.78	5.82	6.99	12.07
CAK	9.24	10.42	7.47	4.54	5.09	10.64	11.86	10.04	3.77	5.12	5.91	12.52
CBM				0.00								
CCR	2.64	1.13	1.95	-1.32	0.49	2.03	0.75	5.94	2.77	7.50	7.05	7.49
CDC	5.11	6.13	2.56	0.02	0.33	1.34	2.66	0.59	1.39	0.24	2.64	6.99
CDV	11.89	10.54	8.35	7.67	9.40	13.43	14.23	19.31	14.81	8.43	8.77	17.78
CEC	11.64	7.51	6.84	1.88	2.92	6.85	5.46	8.28	4.31	6.88	11.16	16.20
CHA	6.93	6.44	5.59	4.52	5.05	9.76	10.34	7.73	4.62	4.52	5.09	8.75
CHO	6.60	5.66	3.69	3.16	3.76	7.55	9.79	8.55	4.47	4.06	5.00	4.88
CHS	7.89	8.21	8.52	6.78	6.63	10.63	11.26	8.80	4.68	5.58	5.76	10.19
CIC	14.35	12.15	7.26	6.39	8.80	12.11	10.92	7.83	8.24	11.36	14.37	18.27
CID	11.40	8.95	8.77	6.04	7.07	10.39	9.21	7.99	3.06	3.48	5.03	12.64
CKB	7.83											
CLD	3.11	3.14	2.50	0.60	1.19	2.26	1.96	0.71	1.97	3.39	0.50	1.85
CLE	7.95	6.92	6.62	4.45	5.27	9.57	8.83	7.44	2.72	3.60	4.53	9.56
CLL	3.57	4.42	2.42	1.19	2.11	7.55	4.39	6.11	-0.72	1.04	2.26	3.36
CLT	5.85	5.44	5.52	3.97	3.77	7.86	7.73	6.28	2.19	2.67	3.62	7.11
CMH	9.53	8.03	8.16	6.25	6.99	11.46	11.01	9.25	4.28	4.74	5.94	11.03
CMI	18.43	13.91	13.38	9.01	10.80	13.61	14.16	12.84	5.83	7.15	10.47	20.84
CMX	12.46	11.20	-6.45	10.49	1.79	5.06	24.55	13.74	12.11	-0.40	6.33	34.69



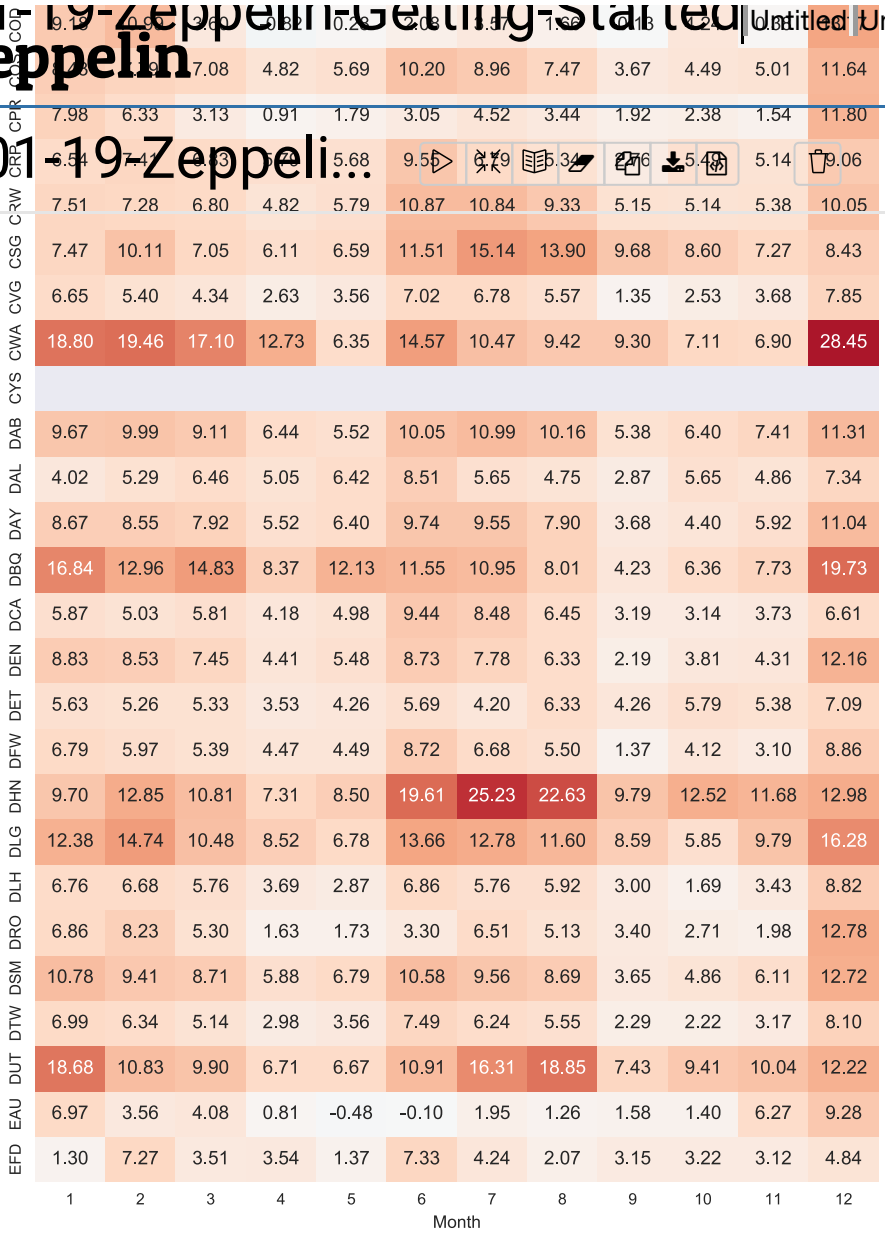
2017-01-19-Zeppelin-Getting-Started

2017-01-19-Zeppelin-Getting-Started Untitled Untitled Untitled Untitled Untitled

Zeppelin

2017-01-19-Zeppeli...

default



Took 1 min 17 sec. Last updated by anonymous at January 21 2017, 2:22:23 PM.

FINISHED

```
%pyspark
from wordcloud import WordCloud
```

```
import StringIO
    show()
    img = StringIO.StringIO()
    p.savefig(img, format='svg')
    img.seek(0)
    print "%html " + img.buf
```

Zeppelin

2017-01-19-Zeppeli...

default

```
# Create route frequencies
routes = sqlContext.sql("SELECT Route, count(*) as Count FROM air_traffic GROUP BY Route").co
route_freq = [(x[0],x[1]) for x in routes]

# Generate word cloud image
wordcloud = WordCloud().generate_from_frequencies(route_freq)
image = wordcloud.to_image()
image.show()
```

Took 1 min 18 sec. Last updated by anonymous at January 21 2017, 2:24:25 PM.

READY