Zeppelin   Notebook ▾

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

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

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```scala
// Load data - adjust the path to the location of your data
val inputPath =  "/Users/skondagadapu/Downloads/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)
```

```
inputPath: String = /Users/skondagadapu/Downloads/Data/*
airTraffic: org.apache.spark.sql.DataFrame = [Year: string, Month: int ... 27 more fields]
```

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```scala
// 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()
    }
)
```

```
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(<
function3>,IntegerType,Some(List(IntegerType, IntegerType, IntegerType)))
```

```
val calcRoute = udf(
    (origin: String, dest: String) => s"$origin - $dest"
```
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```
calcRoute: org.apache.spark.sql.expressions.UserDefinedFunction = UserDefinedFunction(<func
tion2>,StringType,Some(List(StringType, StringType)))
```

```
val calcHourOfArrival = udf(
    (arrTime: String) => arrTime.slice(0,arrTime.size-2)
)
```
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```
calcHourOfArrival: org.apache.spark.sql.expressions.UserDefinedFunction = UserDefinedFuncti
on(<function1>,StringType,Some(List(StringType)))
```

```
val featuredTraffic = airTraffic
    .withColumn("DayOfYear", calcDayOfYear(airTraffic("DayOfMonth"), airTraffic("Month"),
airTraffic("Year")))
    .withColumn("HourOfArr", calcHourOfArrival(airTraffic("ArrTime")))
    .withColumn("Route", calcRoute(airTraffic("Origin"), airTraffic("Dest")))
```
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```
featuredTraffic: org.apache.spark.sql.DataFrame = [Year: string, Month: int ... 30 more fie
lds]
```
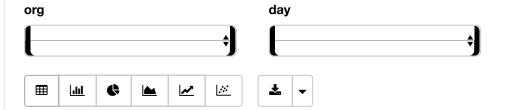
```
featuredTraffic.registerTempTable("air_traffic")
```
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```
warning: there was one deprecation warning; re-run with -deprecation for details
```

```
%sql
select DayOfYear, count(*) as NrOfFlights, avg(DepDelay) as AvgDepDelay, avg(ArrDelay) as
AvgArrDelay from air_traffic group by DayOfYear
having NrOfFlights > 100000
```
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DayOfYear	NrOfFlights	AvgDepDelay
148	126,334	6.4959
243	132,119	8.10514
31	129,945	7.68037
85	132,286	7.3881
137	131,855	8.78982
251	127,204	4.63832
65	133,968	9.10399
53	131,941	10.84511
255	130.849	5.06728

```
%sql                                                    FINISHED ▷ ⌖ 📖 ⚙
select HourOfArr, count(*) as NrFlights, avg(ArrDelay) as AvgArrDelay from air_traffic
where DayOfWeek = ${day=1,1(Monday)|2(Tuesday)|3(Wednesday)|4(Thursday)|5(Friday)|6
(Saturday)|7(Sunday)} and Origin = "${org=ATL,ATL|PHX|PIT}" group by HourOfArr
```

org

day

HourOfArr	NrFlights
7	5,160
15	19,066
11	23,293
3	97
8	11,246
22	20,853
16	20,344
5	5
18	20.379

```
%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 FROM air_traffic group by Dest, Month")
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")
sns.heatmap(heatmap_data, ax=ax, annot=True, fmt=".02f")
```

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Avg Arrival Delay

ABE	8.75	6.54	6.48	5.75	7.51	12.89	11.83	10.49	3.62	3.69	6.20	12.30
ABI	7.96	7.57	6.60	4.14	6.34	18.76	12.49	8.66	1.43	7.52	7.39	12.81
ABQ	8.42	7.70	7.04	6.14	5.65	9.88	8.35	7.85	3.14	6.67	5.83	11.55
BY	6.25	13.41	-1.34	-2.62	1.10	18.40	11.38	11.95	12.41	12.48	8.72	15.41

AI	0.25	13.41	1.34	2.02	1.10	18.40	11.30	11.55	12.41	12.48	0.72	13.41
ACK					20.50	28.19	26.14	22.81	3.42			
ACT	4.13	5.00	2.24	-0.04	0.77	9.68	4.07	6.03	1.19	4.42	3.13	2.09
ACV	10.12	12.70	3.53	6.02	9.14	11.52	10.64	11.78	6.31	14.19	8.23	18.28
ACY	0.03	10.05	1.95	0.99	2.72	22.93	23.84	17.86	5.95	8.89	4.52	10.02
ADK	39.87	18.50	18.00	14.22	-10.47	-9.44	-10.71	12.41	17.71	22.60	7.87	16.21
ADQ	14.13	11.08	9.35	6.23	3.78	8.44	11.64	9.45	7.57	7.56	8.60	11.02
AEX	4.90	6.43	3.01	3.23	6.94	25.50	15.42	14.45	7.34	8.74	7.91	13.00
AGS	3.64	6.90	4.41	7.31	7.30	16.72	13.81	10.63	7.56	8.57	9.77	10.93
AKN	16.26	19.82	16.51	19.16	5.68	14.03	8.44	12.04	9.17	13.87	5.58	18.69
ALB	10.10	8.00	9.89	7.45	9.01	14.32	13.58	12.93	4.69	5.21	6.33	11.62
ALO	-1.29	6.25	5.06	0.98	-4.42	6.11	2.41	3.48	-5.04	1.43	3.26	13.78
AMA	7.05	9.04	9.13	8.33	8.68	15.54	10.04	8.36	5.27	7.98	7.53	12.25
ANC	12.89	11.21	11.82	5.82	7.82	10.01	11.66	14.16	8.34	10.41	9.35	15.70
ANI	19.00	13.06	9.90	19.64	10.52	14.17	30.29	9.33	1.00	10.00	13.46	8.58
APF	7.64	11.95	11.63	4.53	12.69	17.56	31.91	32.20	29.53	5.74	9.39	5.98
ASE	22.49	17.99	8.63	7.50		2.71	5.44	6.87	0.75	-0.70	-3.67	21.09
ATL	8.92	10.28	6.79	5.47	6.26	13.33	11.21	9.10	6.90	6.08	8.11	12.84
ATW	15.14	16.05	9.70	6.63	3.89	15.26	12.02	12.57	3.84	5.41	6.69	17.94
AUS	7.44	7.33	7.28	6.05	5.82	10.53	7.96	6.77	2.20	5.42	5.93	10.47
AVL	4.48	4.89	3.53	3.99	5.38	12.15	10.91	8.67	3.86	7.62	6.28	10.56
AVP	10.79	8.91	8.01	7.43	9.50	18.17	14.13	13.31	4.81	5.06	5.46	14.22
AZO	12.73	10.00	9.78	6.41	7.55	9.16	9.79	8.31	2.12	3.70	5.74	15.36
BDL	7.12	6.61	7.58	5.82	6.33	12.17	10.94	9.96	3.16	3.59	4.79	9.54
BET	13.29	9.73	7.90	4.45	4.78	9.04	11.79	15.60	8.08	11.69	9.39	12.15
BFF												
BFL	6.10	4.65	5.90	3.52	2.44	4.44	3.09	2.86	0.09	3.25	4.13	12.79
BGM	8.82	6.13	4.98	4.67	5.38	12.16	9.50	9.36	4.27	2.52	5.01	11.03
BGR	12.83	9.72	10.80	10.47	10.10	19.09	15.90	13.62	4.65	2.50	3.80	14.74
BHM	7.40	7.20	6.57	5.23	6.90	11.64	10.02	7.28	2.81	4.57	5.25	9.95
BIL	11.31	9.71	6.93	5.05	6.24	11.01	11.27	9.31	3.37	4.83	5.34	16.57
BIS	9.15	11.37	9.06	4.75	6.32	10.36	7.46	8.49	1.78	2.47	3.91	15.58
BJI						9.79	7.37	17.85	9.46	2.00	-7.00	
BLI	16.07	9.18	3.89	-3.00	-2.17	2.26	4.08	11.05	7.79	7.18	9.58	20.38
BMI	17.71	16.02	11.84	7.30	6.23	12.37	7.87	10.77	4.65	3.29	8.13	17.03
BNA	6.40	5.73	5.72	4.65	5.88	9.90	8.68	7.02	1.95	3.71	3.95	9.15
BOI	11.83	9.50	7.98	5.49	5.45	9.67	9.67	10.34	4.65	7.69	6.53	16.59
BOS	8.12	6.30	8.52	7.73	6.52	13.52	11.62	10.73	3.75	3.47	5.84	10.16
BPT	3.67	3.12	3.79	2.86	3.30	13.81	5.03	2.30	-1.52	-0.66	4.32	-0.03
QK	7.55	8.88	7.22	2.65	9.00	17.80	15.78	18.52	12.88	13.13	10.84	13.49

Legend: 60, 30

Dest

BQN	7.91	9.53	11.37	11.68	11.18	19.05	21.93	16.96	4.08	-0.98	4.65	18.04
BRO	6.21	3.15	5.29	3.66	4.40	13.44	4.77	1.50	-1.88	3.03	8.30	11.54
BRW	8.83	13.46	10.26	2.92	9.13	9.93	13.44	14.89	7.49	4.63	4.83	10.27
BTM	13.51	6.67	-1.35	0.98	4.22	6.59	4.01	2.79	0.94	1.60	2.84	16.09
BTR	7.93	9.77	8.23	7.01	7.28	16.52	12.64	8.93	4.58	5.87	7.61	10.73
BTV	11.45	10.25	13.63	8.92	10.11	17.24	16.46	15.31	3.69	4.99	5.64	13.90
BUF	9.98	9.97	8.72	8.82	7.62	13.53	12.55	10.91	3.43	4.30	5.52	11.50
BUR	8.78	8.66	5.91	6.01	4.28	7.33	6.89	7.95	4.37	8.40	8.33	12.86
BWI	6.51	5.56	6.53	4.60	6.88	12.38	10.84	10.25	2.74	3.49	4.80	8.81
BZN	15.59	12.60	7.46	2.74	4.07	9.84	7.20	8.25	3.03	2.80	3.02	17.61
CAE	10.10	10.61	8.77	7.95	8.63	13.88	13.24	11.64	5.48	5.34	7.18	13.33
CAK	9.78	11.64	5.39	4.05	6.33	10.63	10.44	10.07	2.70	4.07	6.21	13.85
CBM				0.00								
CCR										10.67	10.37	13.46
CDC	19.34	15.82	3.26	9.86	3.47	4.10	6.90	-0.16	9.20	7.00	6.34	7.41
CDV	10.48	11.46	8.67	8.69	10.20	21.60	20.77	23.33	18.68	9.74	7.42	17.07
CEC	10.60	14.38	4.79	7.08	4.67	6.16	8.73	10.51	2.81	10.33	5.68	14.84
CHA	7.11	7.28	4.50	6.03	5.94	13.42	10.89	7.43	4.68	5.95	6.60	10.32
CHO	7.21	3.95	-0.37	1.84	4.31	10.79	10.96	10.11	6.28	7.73	8.23	11.12
CHS	7.84	8.23	7.37	6.12	6.96	12.23	11.36	9.22	4.26	5.51	5.96	11.16
CIC	8.96	15.53	1.24	4.72	9.47	8.01	12.13	9.00	7.19	16.05	12.11	13.30
CID	11.85	9.88	8.41	7.03	9.28	12.58	10.26	10.55	2.94	4.73	5.50	13.79
CKB	7.83											
CLD	3.55	2.75	3.88	2.40	2.74	1.25	1.10	-1.38	-1.72	1.48	1.21	1.20
CLE	8.55	6.47	6.55	5.17	5.64	10.48	8.55	7.88	2.00	3.31	4.87	11.22
CLL	3.76	4.36	3.12	1.88	3.56	11.19	4.18	3.74	-1.64	2.99	4.80	4.75
CLT	5.73	5.62	5.92	4.77	3.96	8.80	6.93	6.08	1.10	2.11	3.65	7.47
CMH	10.27	8.65	9.25	7.46	8.55	13.17	11.74	10.72	3.52	5.01	6.72	12.98
CMI	24.17	19.07	18.71	14.61	18.71	16.76	17.05	15.99	3.76	5.55	8.99	20.35
CMX	-0.90	0.32	-5.10	0.41	2.40	6.25	24.55	20.10	26.45	1.57	-6.33	86.55
COD	10.68	17.38	4.18	2.44	1.27	5.71	7.00	5.08	0.79	4.33	0.99	20.88
COS	10.55	10.18	7.51	6.53	7.15	12.81	10.85	9.54	3.92	4.68	5.71	12.97
CPR	17.28	12.28	0.88	2.52	4.44	6.81	7.43	4.47	0.93	1.04	1.80	13.79
CRP	8.14	8.86	7.79	5.96	7.01	15.67	9.60	7.71	5.17	7.22	8.59	10.05
CRW	8.51	8.16	8.44	5.58	7.11	15.09	11.17	9.84	3.92	6.29	6.47	11.67
CSG	2.12	7.43	-0.68	2.09	3.09	12.83	10.32	9.88	12.27	10.19	9.46	11.58
CVG	7.69	5.70	4.12	2.93	4.58	8.14	7.63	5.86	1.45	3.44	4.70	9.87
CWA	19.36	28.18	23.47	15.77	8.45	8.38	3.01	21.11	5.92	5.10	6.43	17.90

0

−30

−60

	1	2	3	4	5	6	7	8	9	10	11	12
DAB	10.91	12.76	8.13	6.59	6.28	14.13	11.20	9.67	5.90	5.74	9.95	13.66
DAL	4.66	6.24	7.34	6.07	7.74	11.59	7.53	6.02	4.13	6.88	6.14	9.05
DAY	8.92	8.50	6.58	6.41	8.30	13.69	11.11	8.98	2.92	4.30	6.97	13.24
DBQ	18.61	16.47	18.35	12.36	13.84	11.69	9.12	11.24	1.61	6.81	6.51	14.38
DCA	5.44	4.62	5.20	4.10	5.11	10.24	7.85	6.88	2.61	2.92	3.75	7.29
DEN	8.62	8.36	5.49	4.35	6.62	10.32	9.73	8.86	1.75	4.14	4.17	13.93
DFW	6.54	6.77	5.32	4.35	3.96	10.77	7.46	5.45	0.26	3.95	3.42	9.04
DHN	7.23	12.92	5.18	2.06	3.21	25.57	21.10	18.50	11.38	12.90	15.30	11.65
DLG	15.48	18.89	15.49	10.47	4.34	14.42	15.16	12.63	7.24	6.75	5.96	16.47
DLH	6.19	10.05	7.41	5.21	5.18	8.94	7.19	8.35	4.25	3.16	6.13	12.78
DRO	12.06	12.05	4.70	3.08	2.51	-0.84	5.74	6.62	2.35	1.57	0.45	13.50
DSM	11.86	11.22	8.91	6.71	8.18	12.86	11.09	11.74	2.88	4.69	6.63	14.42
DTW	6.63	6.48	5.74	3.78	4.96	8.10	6.81	6.45	1.32	1.96	3.84	10.77
DUT	21.70	12.96	9.91	4.21	4.33	12.37	17.37	19.99	7.61	9.92	4.25	6.63
EAU		0.40	-0.14	-8.14	1.61	2.00				3.23	6.62	11.08
EFD	4.72	8.40	1.92	4.83	1.23	9.96	2.24	-2.92	-5.76			
EGE	14.94	15.15	13.20	7.28	3.39	15.15	19.40	16.39	10.35	1.87	3.81	20.83
EKO	12.96	9.70	-0.28	0.46	4.07	4.99	4.52	3.59	2.61	1.81	-1.24	7.36

Month

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```
%pyspark
from wordcloud import WordCloud

import StringIO
def show(p):
  img = StringIO.StringIO()
  p.savefig(img, format='svg')
  img.seek(0)
```

```
  print "%html " + img.buf

# Create route frequencies
routes = sqlContext.sql("SELECT Route, count(*) as Count FROM air_traffic GROUP BY Route"
).collect()
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()
```

%pyspark   FINISHED ▷ ⅗⅚ 📖 ⚙

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

%pyspark   FINISHED ▷ ⅗⅚ 📖 ⚙
```
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 0x10a526f10>]

%pyspark   FINISHED ▷ ⅗⅚ 📖 ⚙
```
show(plt)
```

Avg Arrival Delay

ABE	8.75	6.54	6.48	5.75	7.51	12.89	11.83	10.49	3.62	3.69	6.20	12.30
ABI	7.96	7.57	6.60	4.14	6.34	18.76	12.49	8.66	1.43	7.52	7.39	12.81
ABQ	8.42	7.70	7.04	6.14	5.65	9.88	8.35	7.85	3.14	6.67	5.83	11.55
ABY	6.25	13.41	-1.34	-2.62	1.10	18.40	11.38	11.95	12.41	12.48	8.72	15.41
ACK					20.50	28.19	26.14	22.81	3.42			
ACT	4.13	5.00	2.24	-0.04	0.77	9.68	4.07	6.03	1.19	4.42	3.13	2.09
ACV	10.12	12.70	3.53	6.02	9.14	11.52	10.64	11.78	6.31	14.19	8.23	18.28
ACY	0.03	10.05	1.95	0.99	2.72	22.93	23.84	17.86	5.95	8.89	4.52	10.02
ADK	39.87	18.50	18.00	14.22	-10.47	-9.44	-10.71	12.41	17.71	22.60	7.87	16.21
ADQ	14.13	11.08	9.35	6.23	3.78	8.44	11.64	9.45	7.57	7.56	8.60	11.02
AEX	4.90	6.43	3.01	3.23	6.94	25.50	15.42	14.45	7.34	8.74	7.91	13.00
AGS	3.64	6.90	4.41	7.31	7.30	16.72	13.81	10.63	7.56	8.57	9.77	10.93
AKN	16.26	19.82	16.51	19.16	5.68	14.03	8.44	12.04	9.17	13.87	5.58	18.69
ALB	10.10	8.00	9.89	7.45	9.01	14.32	13.58	12.93	4.69	5.21	6.33	11.62
ALO	-1.29	6.25	5.06	0.98	-4.42	6.11	2.41	3.48	-5.04	1.43	3.26	13.78
AMA	7.05	9.04	9.13	8.33	8.68	15.54	10.04	8.36	5.27	7.98	7.53	12.25
ANC	12.89	11.21	11.82	5.82	7.82	10.01	11.66	14.16	8.34	10.41	9.35	15.70
ANI	19.00	13.06	9.90	19.64	10.52	14.17	30.29	9.33	1.00	10.00	13.46	8.58
APF	7.64	11.95	11.63	4.53	12.69	17.56	31.91	32.20	29.53	5.74	9.39	5.98
ASE	22.49	17.99	8.63	7.50		2.71	5.44	6.87	0.75	-0.70	-3.67	21.09
ATL	8.92	10.28	6.79	5.47	6.26	13.33	11.21	9.10	6.90	6.08	8.11	12.84
ATW	15.14	16.05	9.70	6.63	3.89	15.26	12.02	12.57	3.84	5.41	6.69	17.94
AUS	7.44	7.33	7.28	6.05	5.82	10.53	7.96	6.77	2.20	5.42	5.93	10.47
AVL	4.48	4.89	3.53	3.99	5.38	12.15	10.91	8.67	3.86	7.62	6.28	10.56
AVP	10.79	8.91	8.01	7.43	9.50	18.17	14.13	13.31	4.81	5.06	5.46	14.22
AZO	12.73	10.00	9.78	6.41	7.55	9.16	9.79	8.31	2.12	3.70	5.74	15.36
BDL	7.12	6.61	7.58	5.82	6.33	12.17	10.94	9.96	3.16	3.59	4.79	9.54
BET	13.29	9.73	7.90	4.45	4.78	9.04	11.79	15.60	8.08	11.69	9.39	12.15
BFF												
BFL	6.10	4.65	5.90	3.52	2.44	4.44	3.09	2.86	0.09	3.25	4.13	12.79
BGM	8.82	6.13	4.98	4.67	5.38	12.16	9.50	9.36	4.27	2.52	5.01	11.03
BGR	12.83	9.72	10.80	10.47	10.10	19.09	15.90	13.62	4.65	2.50	3.80	14.74
BHM	7.40	7.20	6.57	5.23	6.90	11.64	10.02	7.28	2.81	4.57	5.25	9.95
BIL	11.31	9.71	6.93	5.05	6.24	11.01	11.27	9.31	3.37	4.83	5.34	16.57
BIS	9.15	11.37	9.06	4.75	6.32	10.36	7.46	8.49	1.78	2.47	3.91	15.58

60

Dest												
BJI						9.79	7.37	17.85	9.46	2.00	-7.00	
BLI	16.07	9.18	3.89	-3.00	-2.17	2.26	4.08	11.05	7.79	7.18	9.58	20.38
BMI	17.71	16.02	11.84	7.30	6.23	12.37	7.87	10.77	4.65	3.29	8.13	17.03
BNA	6.40	5.73	5.72	4.65	5.88	9.90	8.68	7.02	1.95	3.71	3.95	9.15
BOI	11.83	9.50	7.98	5.49	5.45	9.67	9.67	10.34	4.65	7.69	6.53	16.59
BOS	8.12	6.30	8.52	7.73	6.52	13.52	11.62	10.73	3.75	3.47	5.84	10.16
BPT	3.67	3.12	3.79	2.86	3.30	13.81	5.03	2.30	-1.52	-0.66	4.32	-0.03
BQK	7.55	8.88	7.22	2.65	9.00	17.80	15.78	18.52	12.88	13.13	10.84	13.49
BQN	7.91	9.53	11.37	11.68	11.18	19.05	21.93	16.96	4.08	-0.98	4.65	18.04
BRO	6.21	3.15	5.29	3.66	4.40	13.44	4.77	1.50	-1.88	3.03	8.30	11.54
BRW	8.83	13.46	10.26	2.92	9.13	9.93	13.44	14.89	7.49	4.63	4.83	10.27
BTM	13.51	6.67	-1.35	0.98	4.22	6.59	4.01	2.79	0.94	1.60	2.84	16.09
BTR	7.93	9.77	8.23	7.01	7.28	16.52	12.64	8.93	4.58	5.87	7.61	10.73
BTV	11.45	10.25	13.63	8.92	10.11	17.24	16.46	15.31	3.69	4.99	5.64	13.90
BUF	9.98	9.97	8.72	8.82	7.62	13.53	12.55	10.91	3.43	4.30	5.52	11.50
BUR	8.78	8.66	5.91	6.01	4.28	7.33	6.89	7.95	4.37	8.40	8.33	12.86
BWI	6.51	5.56	6.53	4.60	6.88	12.38	10.84	10.25	2.74	3.49	4.80	8.81
BZN	15.59	12.60	7.46	2.74	4.07	9.84	7.20	8.25	3.03	2.80	3.02	17.61
CAE	10.10	10.61	8.77	7.95	8.63	13.88	13.24	11.64	5.48	5.34	7.18	13.33
CAK	9.78	11.64	5.39	4.05	6.33	10.63	10.44	10.07	2.70	4.07	6.21	13.85
CBM				0.00								
CCR										10.67	10.37	13.46
CDC	19.34	15.82	3.26	9.86	3.47	4.10	6.90	-0.16	9.20	7.00	6.34	7.41
CDV	10.48	11.46	8.67	8.69	10.20	21.60	20.77	23.33	18.68	9.74	7.42	17.07
CEC	10.60	14.38	4.79	7.08	4.67	6.16	8.73	10.51	2.81	10.33	5.68	14.84
CHA	7.11	7.28	4.50	6.03	5.94	13.42	10.89	7.43	4.68	5.95	6.60	10.32
CHO	7.21	3.95	-0.37	1.84	4.31	10.79	10.96	10.11	6.28	7.73	8.23	11.12
CHS	7.84	8.23	7.37	6.12	6.96	12.23	11.36	9.22	4.26	5.51	5.96	11.16
CIC	8.96	15.53	1.24	4.72	9.47	8.01	12.13	9.00	7.19	16.05	12.11	13.30
CID	11.85	9.88	8.41	7.03	9.28	12.58	10.26	10.55	2.94	4.73	5.50	13.79
CKB	7.83											
CLD	3.55	2.75	3.88	2.40	2.74	1.25	1.10	-1.38	-1.72	1.48	1.21	1.20
CLE	8.55	6.47	6.55	5.17	5.64	10.48	8.55	7.88	2.00	3.31	4.87	11.22
CLL	3.76	4.36	3.12	1.88	3.56	11.19	4.18	3.74	-1.64	2.99	4.80	4.75
CLT	5.73	5.62	5.92	4.77	3.96	8.80	6.93	6.08	1.10	2.11	3.65	7.47
CMH	10.27	8.65	9.25	7.46	8.55	13.17	11.74	10.72	3.52	5.01	6.72	12.98
CMI	24.17	19.07	18.71	14.61	18.71	16.76	17.05	15.99	3.76	5.55	8.99	20.35
CMX	-0.90	0.32	-5.10	0.41	2.40	6.25	24.55	20.10	26.45	1.57	-6.33	86.55
COD	10.68	17.38	4.18	2.44	1.27	5.71	7.00	5.08	0.79	4.33	0.99	20.88

Color scale: 30 / 0 / −30 / −60

	1	2	3	4	5	6	7	8	9	10	11	12
COS	10.55	10.18	7.51	6.53	7.15	12.81	10.85	9.54	3.92	4.68	5.71	12.97
CPR	17.28	12.28	0.88	2.52	4.44	6.81	7.43	4.47	0.93	1.04	1.80	13.79
CRP	8.14	8.86	7.79	5.96	7.01	15.67	9.60	7.71	5.17	7.22	8.59	10.05
CRW	8.51	8.16	8.44	5.58	7.11	15.09	11.17	9.84	3.92	6.29	6.47	11.67
CSG	2.12	7.43	-0.68	2.09	3.09	12.83	10.32	9.88	12.27	10.19	9.46	11.58
CVG	7.69	5.70	4.12	2.93	4.58	8.14	7.63	5.86	1.45	3.44	4.70	9.87
CWA	19.36	28.18	23.47	15.77	8.45	8.38	3.01	21.11	5.92	5.10	6.43	17.90
CYS												
DAB	10.91	12.76	8.13	6.59	6.28	14.13	11.20	9.67	5.90	5.74	9.95	13.66
DAL	4.66	6.24	7.34	6.07	7.74	11.59	7.53	6.02	4.13	6.88	6.14	9.05
DAY	8.92	8.50	6.58	6.41	8.30	13.69	11.11	8.98	2.92	4.30	6.97	13.24
DBQ	18.61	16.47	18.35	12.36	13.84	11.69	9.12	11.24	1.61	6.81	6.51	14.38
DCA	5.44	4.62	5.20	4.10	5.11	10.24	7.85	6.88	2.61	2.92	3.75	7.29
DEN	8.62	8.36	5.49	4.35	6.62	10.32	9.73	8.86	1.75	4.14	4.17	13.93
DFW	6.54	6.77	5.32	4.35	3.96	10.77	7.46	5.45	0.26	3.95	3.42	9.04
DHN	7.23	12.92	5.18	2.06	3.21	25.57	21.10	18.50	11.38	12.90	15.30	11.65
DLG	15.48	18.89	15.49	10.47	4.34	14.42	15.16	12.63	7.24	6.75	5.96	16.47
DLH	6.19	10.05	7.41	5.21	5.18	8.94	7.19	8.35	4.25	3.16	6.13	12.78
DRO	12.06	12.05	4.70	3.08	2.51	-0.84	5.74	6.62	2.35	1.57	0.45	13.50
DSM	11.86	11.22	8.91	6.71	8.18	12.86	11.09	11.74	2.88	4.69	6.63	14.42
DTW	6.63	6.48	5.74	3.78	4.96	8.10	6.81	6.45	1.32	1.96	3.84	10.77
DUT	21.70	12.96	9.91	4.21	4.33	12.37	17.37	19.99	7.61	9.92	4.25	6.63
EAU		0.40	-0.14	-8.14	1.61	2.00				3.23	6.62	11.08
EFD	4.72	8.40	1.92	4.83	1.23	9.96	2.24	-2.92	-5.76			
EGE	14.94	15.15	13.20	7.28	3.39	15.15	19.40	16.39	10.35	1.87	3.81	20.83
EKO	12.96	9.70	-0.28	0.46	4.07	4.99	4.52	3.59	2.61	1.81	-1.24	7.36

Month

READY ▷ ⋺⋹ 📖 ⚙