
# Principles of Big Data Management

COMP-SCI-5540

Fall 2019

## Project Phase-II

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**Abstract:**

1. Performing analysis on the Twitter data being collected by the means of various queries.
2. Visualization of data.

**Used Technologies:**

1. Python
2. Spark

**Tools:**

Spyder (Python 3.7), Tableau

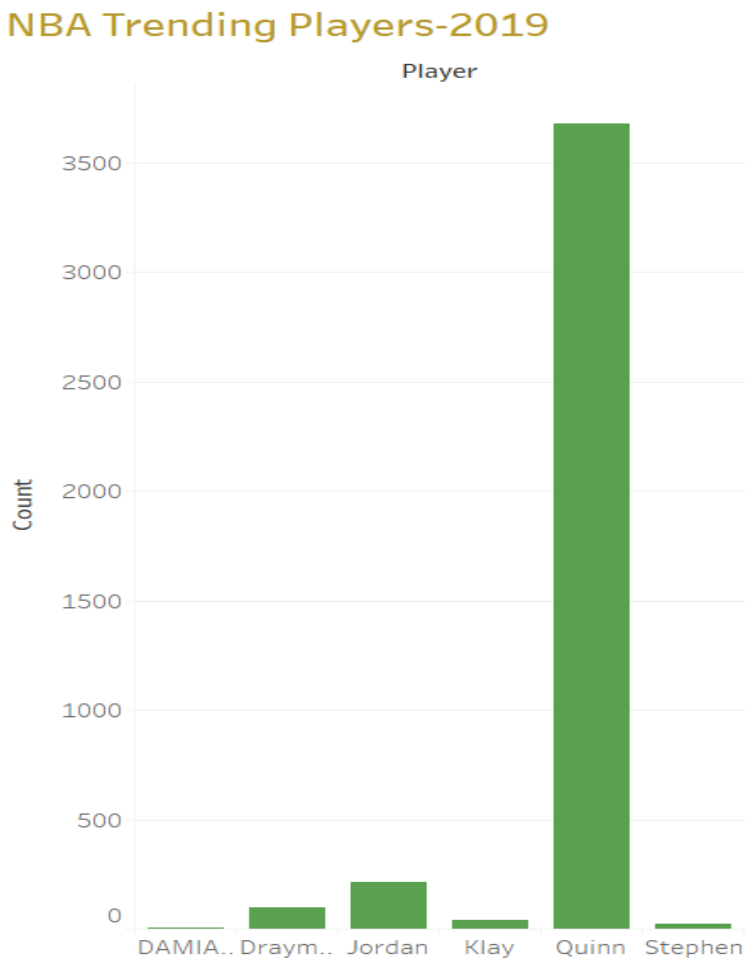
**Queries:**

## Query 1:

List of Trending Players of National Basketball Association(NBA) and the visualization through bar graph.

```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

df.createOrReplaceTempView("NBA")

  sqlhash = spark.sql("SELECT 'Quinn' player,count(text) as count  \

    FROM NBA\

    WHERE 1=1\

    AND (upper(text) LIKE '%COOK%' or upper(text) LIKE '%QUINN%' or upper(text) LIKE '%QUI%')\

    GROUP BY player\

    UNION\

    SELECT 'Klay' player,count(text) as count \

    FROM NBA\

    WHERE 1=1\

    AND (upper(text) LIKE '%KLAY%' or upper(text) LIKE '%THOMPSON%')\

    GROUP BY player\

    UNION\

    SELECT 'Stephen' player,count(text) as count \

    FROM NBA\
```

```
    WHERE 1=1\
    AND (upper(text) LIKE '%STEPHEN%' or text LIKE '%stephen%')\
    GROUP BY player\
    UNION\
    SELECT 'Draymond' player,count(text) as count\
    FROM NBA\
    WHERE 1=1\
    AND (upper(text) LIKE '%DRAYMOND%' or upper(text) LIKE '%GREEN%')\
    GROUP BY player\
    UNION\
    SELECT 'DAMIAN' player,count(text) as count \
    FROM NBA\
    WHERE 1=1\
    AND (upper(text) LIKE '%DAMIAN%' or text LIKE '%damian%')\
    GROUP BY player\
    UNION\
    SELECT 'Jordan' player,count(text) as count \
    FROM NBA\
    WHERE 1=1\
    AND (upper(text) LIKE '%JORDAN BELL%' or upper(text) LIKE '%JORDAN%' or upper(text) LIKE '%BELL%')\
    GROUP BY player'')
  sqlhash.show()
  sqlhash.toPandas().to_csv('1.csv')
```




## Query2:

NBA 2019 - Number of matches being held in various cities and the visualization using pie-chart.

df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

df.createOrReplaceTempView("nba")

sqldf= spark.sql("SELECT 'Staples Center' Arena,'Los Angeles' City,count(*) FROM nba WHERE upper(text) LIKE '%LOS ANGELES%' or text like '%los angeles%' \

UNION \

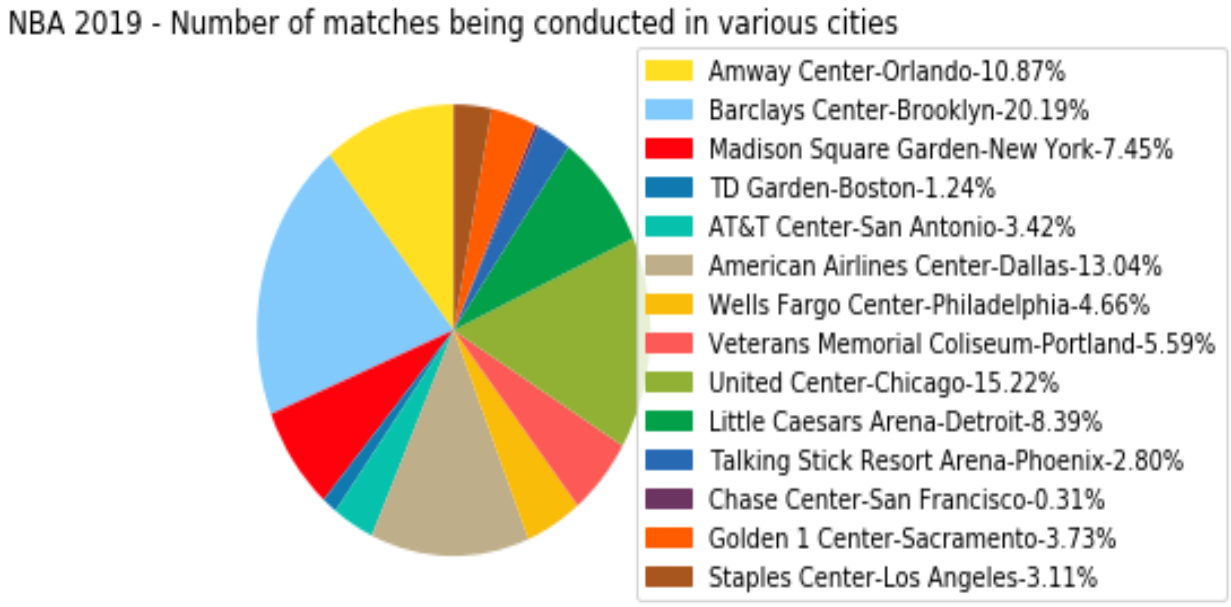
SELECT 'Amway Center' Arena,'Orlando' City,count(*) FROM nba WHERE upper(text) LIKE '%ORLANDO%' or text like '%orlando%' \

```
UNION \

SELECT 'TD Garden' Arena,'Boston' City,count(*) FROM nba WHERE upper(text) LIKE '%BOSTON' or text like '%boston%' \

UNION \

SELECT 'American Airlines Center' Arena,'Dallas' City,count(*) FROM nba WHERE upper(text) LIKE '%DALLAS%' or text like '%dallas%' \

UNION \

SELECT 'Madison Square Garden' Arena,'New York' City,count(*) FROM nba WHERE upper(text) LIKE '%NEW YORK%' or text like '%new york%' \

UNION \

SELECT 'Veterans Memorial Coliseum' Arena,'Portland' City,count(*) FROM nba WHERE upper(text) LIKE '%PORTLAND%' or text like '%portland%' \

UNION \

SELECT 'Wells Fargo Center' Arena,'Philadelphia' City,count(*) FROM nba WHERE upper(text) LIKE '%PHILADELPHIA%' or text like '%philadelphia%' \

UNION \

SELECT 'Golden 1 Center' Arena,'Sacramento' City,count(*) FROM nba WHERE upper(text) LIKE '%SACRAMENTO%' or text like '%sacramento%' \

UNION \

SELECT 'Barclays Center' Arena,'Brooklyn' City,count(*) FROM nba WHERE upper(text) LIKE '%BROOKLYN%' or text like '%brooklyn%' \

UNION \

SELECT 'AT&T Center' Arena,'San Antonio' City,count(*) FROM nba WHERE upper(text) LIKE '%SAN ANTONIO%' or text like '%san antonio%' \

UNION \

SELECT 'Little Caesars Arena' Arena,'Detroit' City,count(*) FROM nba WHERE upper(text) LIKE '%DETROIT%' or text like '%detroit%' \

UNION \

SELECT 'Chase Center' Arena,'San Francisco' City,count(*) FROM nba WHERE upper(text) LIKE '%SAN FRANCISCO%' or text like '%san francisco%' \

UNION \
```

```
SELECT 'Talking Stick Resort Arena' Arena,'Phoenix' City,count(*) FROM nba WHERE upper(text) LIKE '%PHOENIX%' or text like '%phoenix%' \

UNION \

SELECT 'United Center' Arena,'Chicago' City,count(*) FROM nba WHERE upper(text) LIKE '%CHICAGO%' or text like '%chicago%'")

sqldf.show(150)


sqldf.toPandas().to_csv('2.csv')
```

## Output:

| Arena | City | count(1) |
|---|---|---|
| Amway Center | Orlando | 35 |
| Barclays Center | Brooklyn | 65 |
| Madison Square Ga... | New York | 24 |
| TD Garden | Boston | 4 |
| AT&T Center | San Antonio | 11 |
| American Airlines... | Dallas | 42 |
| Wells Fargo Center | Philadelphia | 15 |
| Veterans Memorial... | Portland | 18 |
| United Center | Chicago | 49 |
| Little Caesars Arena | Detroit | 27 |
| Talking Stick Res... | Phoenix | 9 |
| Chase Center | San Francisco | 1 |
| Golden 1 Center | Sacramento | 12 |
| Staples Center | Los Angeles | 10 |



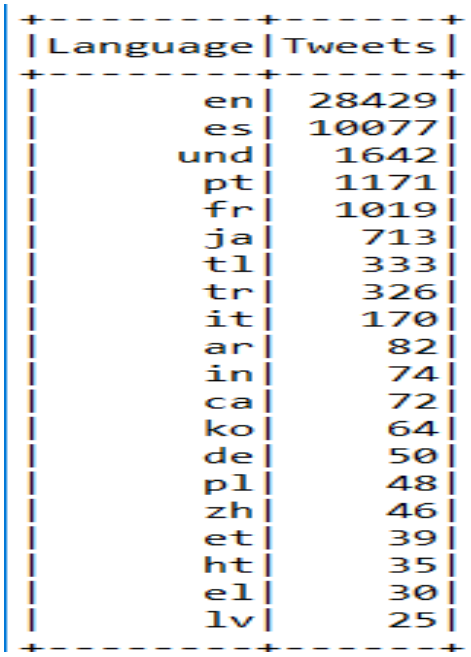

## Tableau Visualization

## Query3:

Display of Tweets from top 20 languages and the visualization using bar-graph

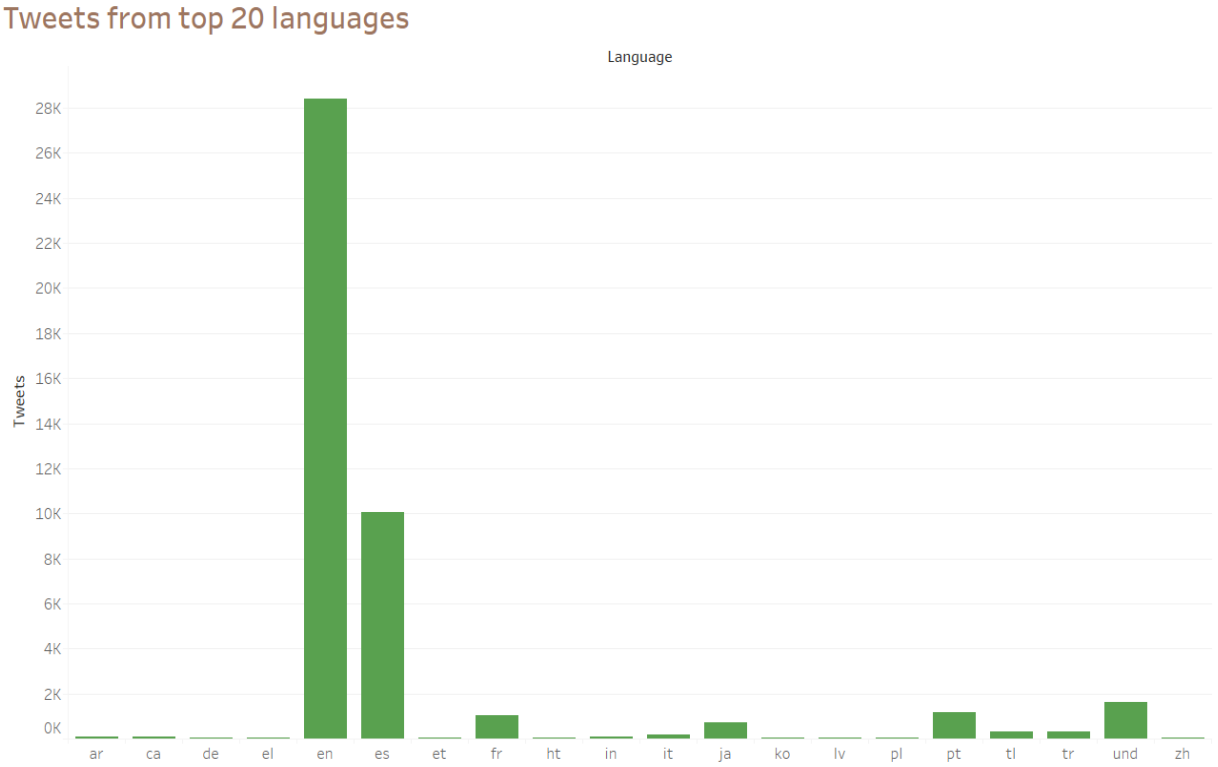
```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

    df.createOrReplaceTempView("nba")

    sqldf= spark.sql("SELECT nba.lang Language,count(*) Tweets  FROM nba WHERE nba.lang is NOT NULL  GROUP BY nba.lang ORDER BY 2 DESC limit 20")

    sqldf.show(150)
```

## Output:



| Language | Tweets |
|---|---|
| en | 28429 |
| es | 10077 |
| und | 1642 |
| pt | 1171 |
| fr | 1019 |
| ja | 713 |
| tl | 333 |
| tr | 326 |
| it | 170 |
| ar | 82 |
| in | 74 |
| ca | 72 |
| ko | 64 |
| de | 50 |
| pl | 48 |
| zh | 46 |
| et | 39 |
| ht | 35 |
| el | 30 |
| lv | 25 |

## Tableau Visualization




## Query 4:

Displaying the supporters and hatters of LeBron James in NBA-2019 and the visualization using Donut Pie-Chart.

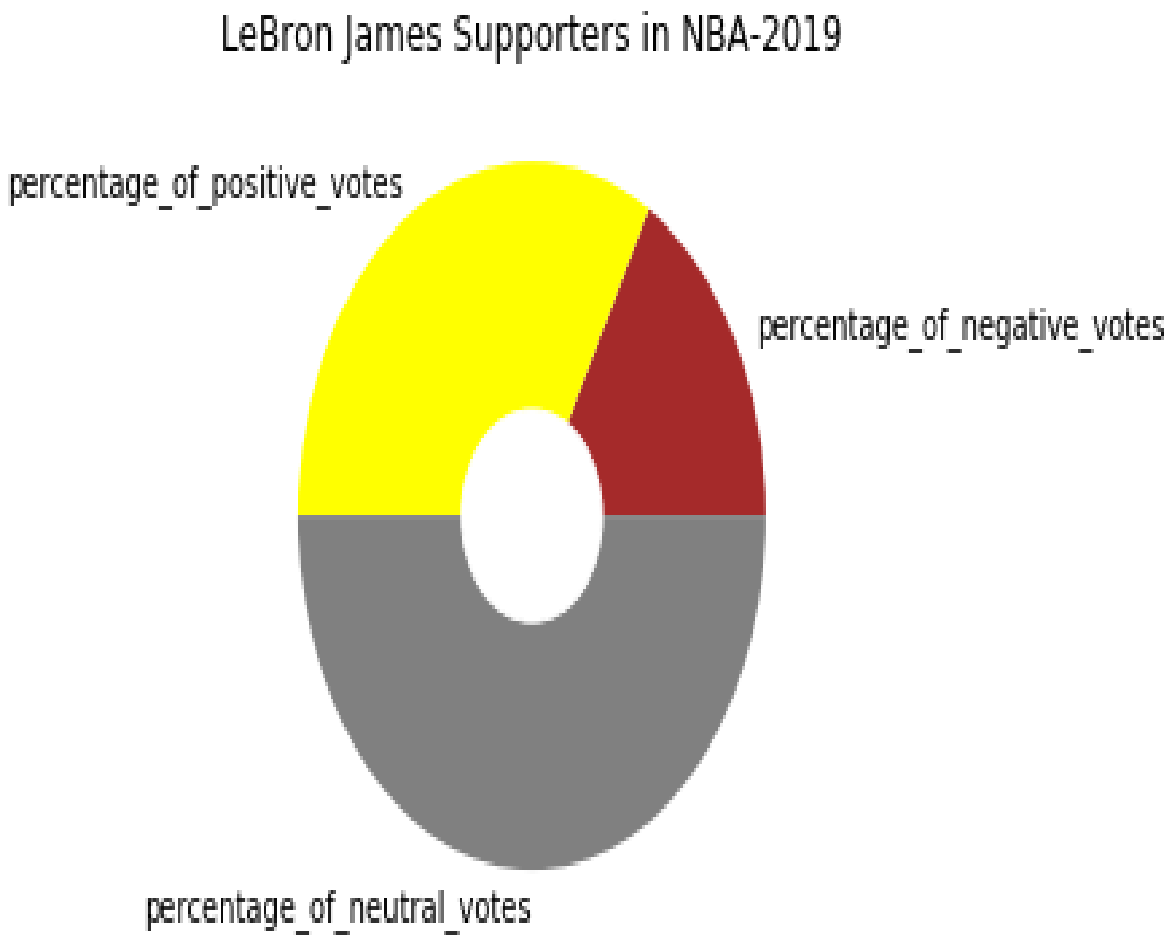
```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

date= df.select("created_at")

def dateMTest(dateval):

    dt=datetime.datetime.strptime(dateval, '%a %b %d %H:%M:%S +0000 %Y')

    return dt

d = udf(dateMTest , DateType())

df=df.withColumn("created_date",d(date.created_at))

df.createOrReplaceTempView("nba")

sqldf= spark.sql("SELECT id,text,created_date  FROM nba WHERE 1=1 AND (upper(text) LIKE '%LEBRON%'AND text LIKE '%nba%')")
```

```
i=0
positive=0
neutral=0
negative=0
for t in sqldf.select("text").collect():
    i=i+1

    analysis = TextBlob(str((t.text).encode('ascii', 'ignore')))
    print(analysis.sentiment.polarity)
    if (analysis.sentiment.polarity<0):
            negative=negative+1
            print(i," in negative")
    elif(analysis.sentiment.polarity==0.0):
        neutral=neutral+1
        print(i," in neutral")
    elif(analysis.sentiment.polarity>0):
        positive=positive+1
        print(i," in positive")
print("The total negative percentage is",((negative)*100)/i)
print("The total neutral percentage is",((neutral)*100)/i)
print("The total positive percentage is",((positive)*100)/i)
percentage_of_negative_votes=((negative)*100)/i
percentage_of_positive_votes=((positive)*100)/i
percentage_of_neutral_votes=((neutral)*100)/i
```

**Output:**

```
0.4375
1  in positive
1.0
2  in positive
0.30625
3  in positive
0.0
4  in neutral
0.0
5  in neutral
0.0
6  in neutral
0.0
7  in neutral
-0.25
8  in negative
-0.11111111111111105
9  in negative
1.0
10  in positive
0.0
11  in neutral
0.0
12  in neutral
The total negative percentage is 16.666666666666668
```

## Tableau Visualization




## Query5:

List of top NBA players and their occurrences.

```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")
```

```
df.createOrReplaceTempView("NBA")
```

```
sqlDF = spark.sql("SELECT 'Chris Paul' as Player, count(*) as Occurrences from nba where text like '%chris paul%' or text like '%nba%' or upper(text) like '%CHRIS PAUL%' or upper(text) like '%NBA%'\
```

UNION\

SELECT 'Stephen Curry' as Player, count(*) as Occurrences from nba where text like '%curry%' or upper(text) like '%CURRY%'\

UNION\

SELECT 'Kevin Durant' as Player, count(*) as Occurrences from nba where text like '%kevin durant%' or upper(text) like '%KEVIN DURANT%' or text like '%nba%' or upper(text) like '%NBA%'  UNION\

SELECT 'LeBron James' as Player, count(*) as Occurrences from nba where text like '%lebron%' or upper(text) like '%LEBRON%' or text like '%LeBron James'  UNION\

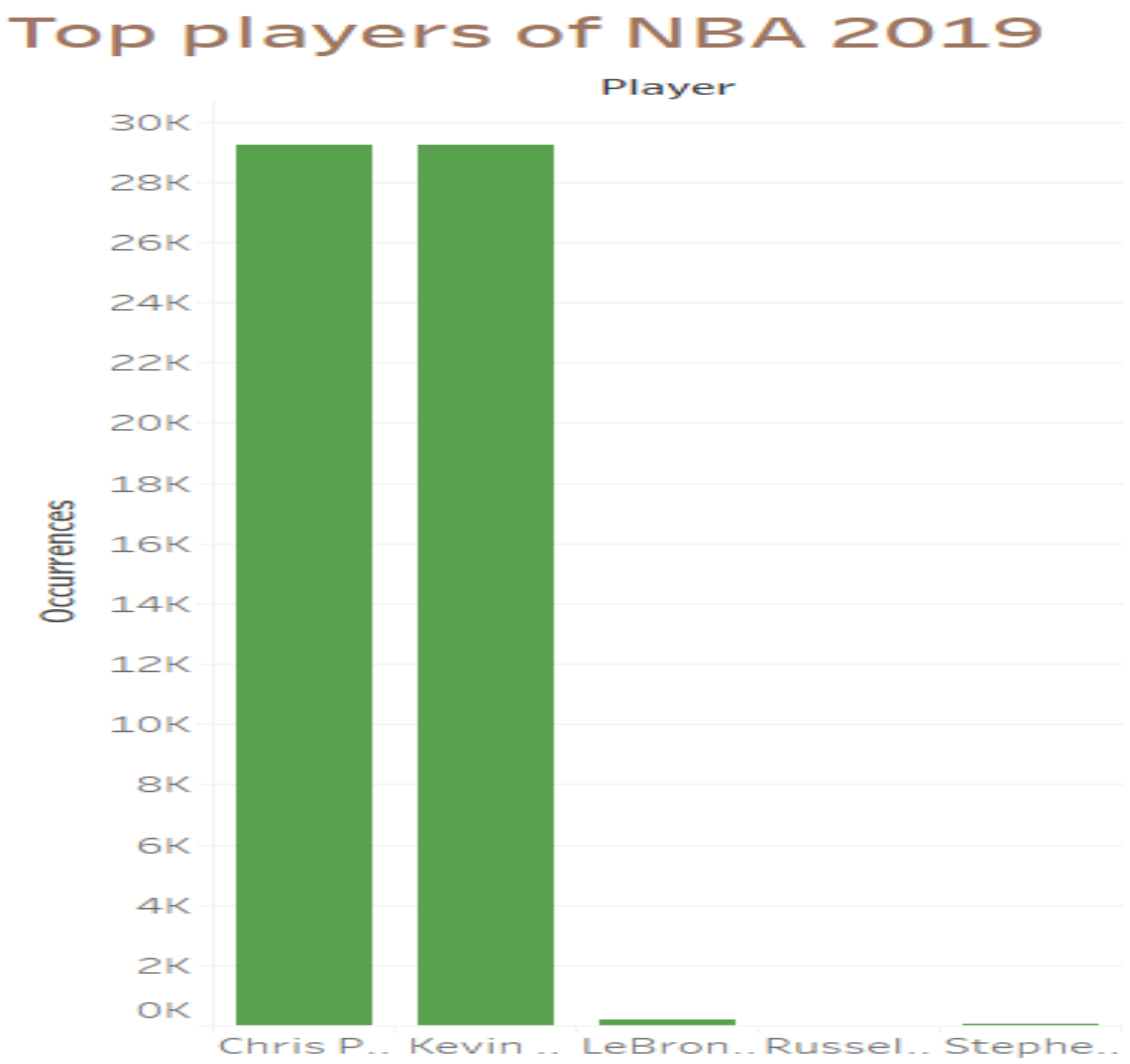
SELECT 'Russell Westbrook' as Player, count(*) as Occurrences from nba where text like '%westbrook%' or upper(text) like '%WESTBROOK%'")

pd = sqlDF.toPandas()

## Output:

| Player | Occurrences |
|---|---|
| Russell Westbrook | 12 |
| Stephen Curry | 52 |
| Kevin Durant | 29233 |
| LeBron James | 179 |
| Chris Paul | 29230 |

## Tableau Visualization



## Query6:

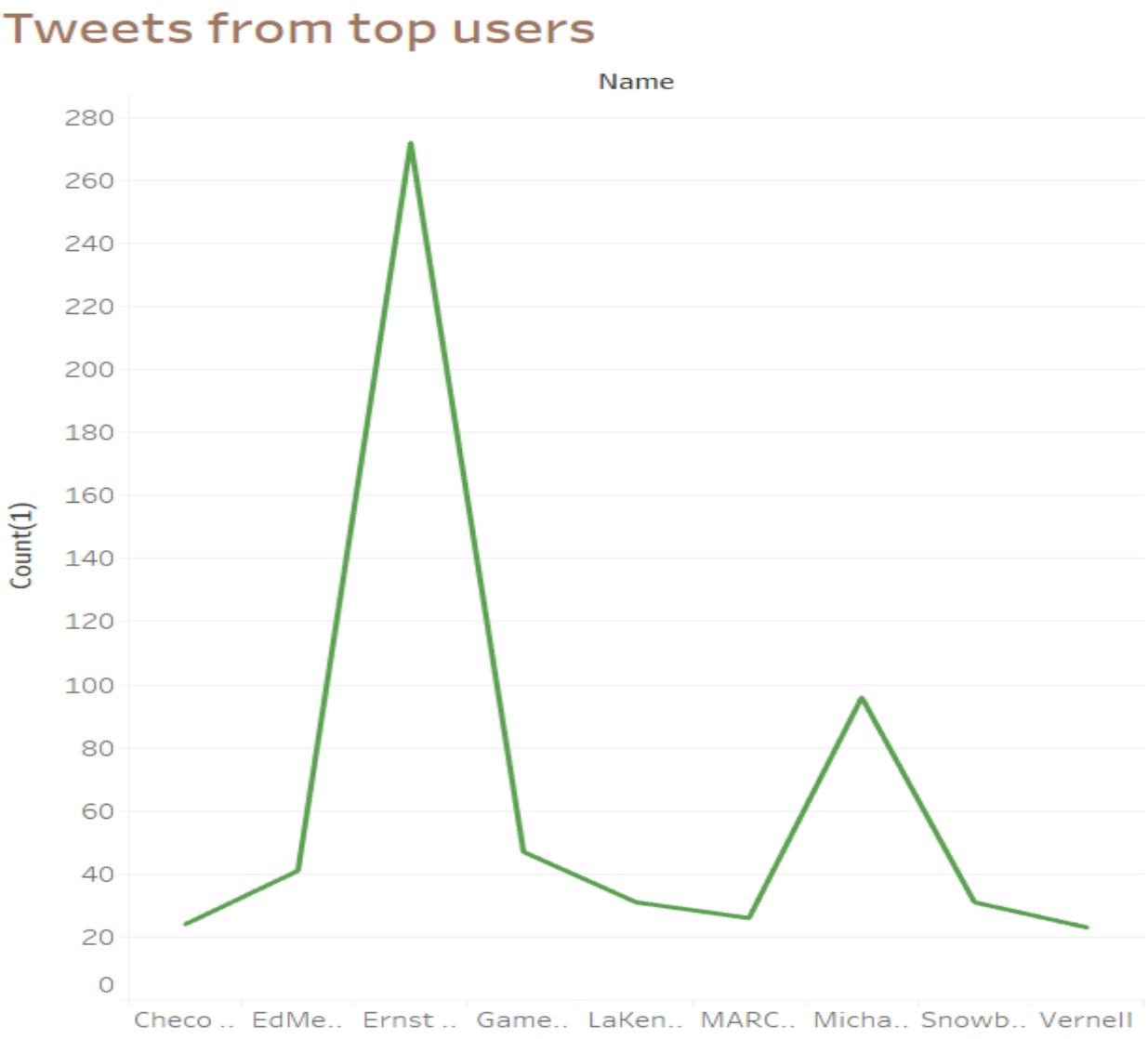
Tweets from top Users and the visualization using line-graph.

```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

df.createOrReplaceTempView("Users")

sqldf = spark.sql(

   "SELECT user.id,user.name,count(*) FROM Users"

   " WHERE (user.id is not null and user.name is not null) group by user.id,user.name order by 3 desc limit 9")

sqldf.show(150)
```

## Output:

```
+-------------------+--------------------+--------+
|                 id|                name|count(1)|
+-------------------+--------------------+--------+
|          949768987|      Ernst Nordholt|     272|
|          141768684|       Michael Ricca|      96|
|1147273485435248642|         GameDayBlog|      47|
|1126307097099014144|           EdMemphis|      41|
|          920122212|          Snowberrys|      31|
|           22679471|LaKenneth Jenks-B...|      31|
|         2438298139|       MARCO MARASCA|      26|
|         2780700879|       Checo Sánchez|      24|
|          463405445|             Vernell|      23|
+-------------------+--------------------+--------+
```

## Tableau Visualization



## Query7:

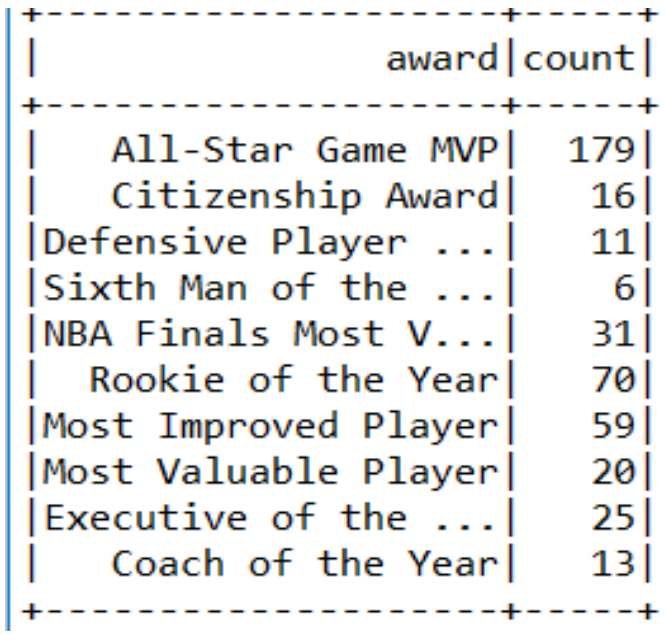
List of Popular Awards of NBA.

```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

df.createOrReplaceTempView("nba")

sqldf = spark.sql("SELECT 'All-Star Game MVP' award,count(text) as count  \

   FROM nba\

   WHERE 1=1\

   AND (upper(text) LIKE '%MVP%' or upper(text) LIKE '%LEBRON JAMES%' or text like '%LeBron James%' or upper(text) LIKE '%LEBRON%' or text like '%LeBron%')\

   GROUP BY award\

   UNION\

   SELECT 'Rookie of the Year' award,count(text) as count \

   FROM nba\

   WHERE 1=1\

   AND (upper(text) LIKE '%ROOKIE%' or (upper(text) LIKE '%STEPHEN%' or upper(text) LIKE '%CURRY%' or text like '%stephen%')\

   GROUP BY award     UNION\

   SELECT 'Most Valuable Player' award,count(text) as count \

   FROM nba\

   WHERE 1=1\

   AND (upper(text) LIKE '%MOST VALUABLE PLAYER%' or upper(text) LIKE '%KEVIN DURANT%' or text like '%kevin durant%' or text like '%Durant%')\

   GROUP BY award   UNION\

   SELECT 'Coach of the Year' award,count(text) as count \

   FROM nba\

   WHERE 1=1\

   AND (upper(text) LIKE '%COACH OF THE YEAR%' or upper(text) LIKE '%ANTHONY DAVIS%' or text like '%anthony davis%')\
```

```
GROUP BY award   UNION\

SELECT 'NBA Finals Most Valuable Player' award,count(text) as count \

FROM nba\

WHERE 1=1\

AND (upper(text) LIKE '%NBA FINALS MOST VALUABLE%' or upper(text) LIKE '%JAMES HARDEN%' or text like '%james harden%')\

GROUP BY award   UNION\

SELECT 'Executive of the Year' award,count(text) as count \

FROM nba\

WHERE 1=1\

AND (upper(text) LIKE '%EXECUTIVE OF THE YEAR%' or upper(text) LIKE '%ANTETOKOUNMPO%' or text like '%antetokounmpo%')\

GROUP BY award  UNION\

SELECT 'Citizenship Award' award,count(text) as count \

FROM nba\

WHERE 1=1\

AND (upper(text) LIKE '%CITIZENSHIP AWARD%' or upper(text) LIKE '%EMBIID%' or text like '%Embiid%')\

GROUP BY award  UNION\

SELECT 'Defensive Player of the Year' award,count(text) as count \

FROM nba\

WHERE 1=1\

AND (upper(text) LIKE '%DEFENSIVE PLAYER%'  or upper(text) LIKE '%RUSSELL WESTBROOK%' or text like '%Westbrook%')\

GROUP BY award  UNION\

SELECT 'Sixth Man of the Year' award,count(text) as count \

FROM nba\

WHERE 1=1\

AND (upper(text) LIKE '%SIXTH MAN OF THE YEAR%' or upper(text) LIKE '%PAUL GEORGE%' or text like '%Paul George%')\
```

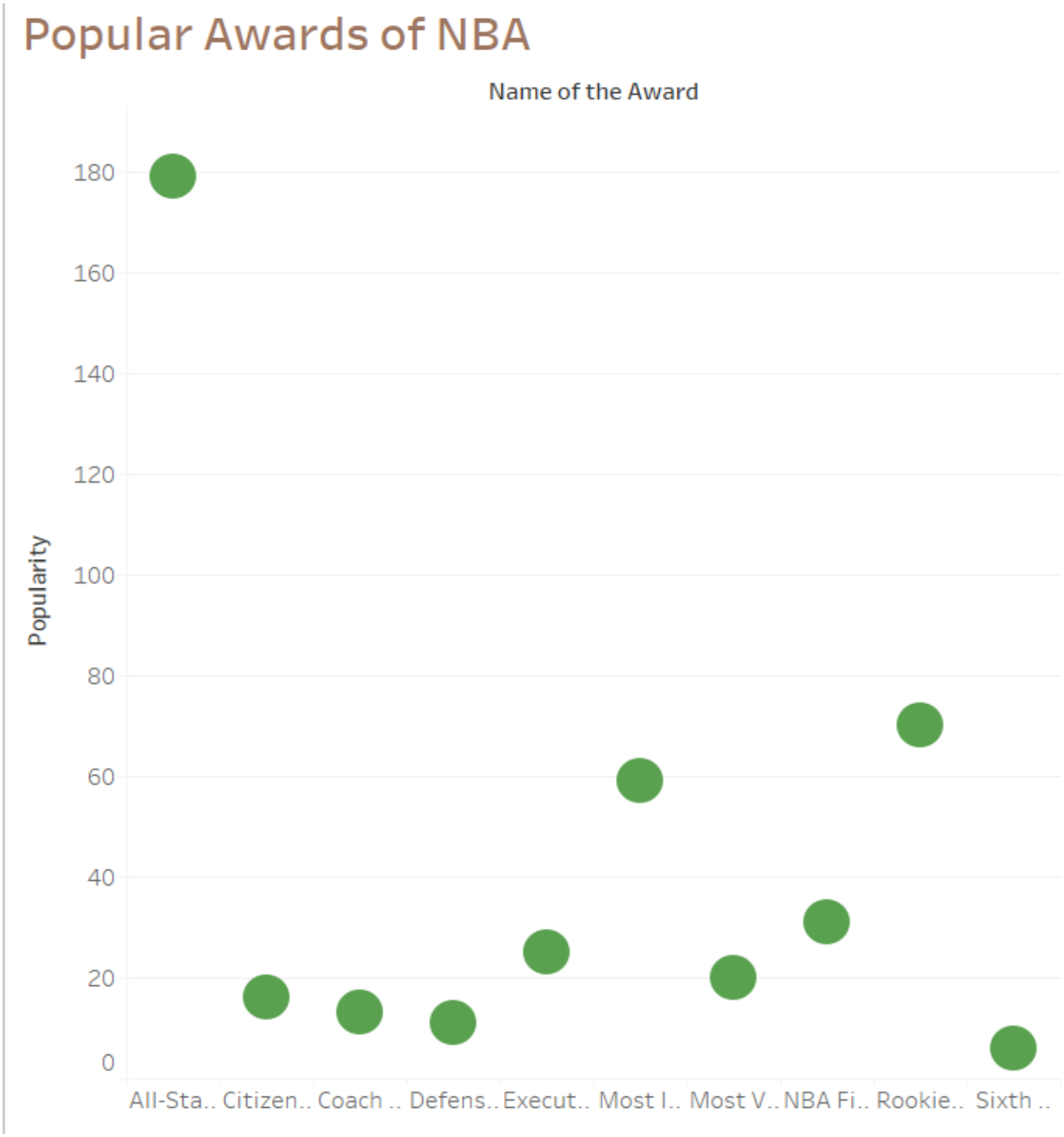
```
GROUP BY award  UNION\
SELECT 'Most Improved Player' award,count(text) as count \
FROM nba\
WHERE 1=1\
AND (upper(text) LIKE '%MOST IMPROVED PLAYER%' or upper(text) LIKE '%KAWHI LEONARD%' or text like '%Kawhi Leonard%' or text like '%Kawhi%')\
GROUP BY award")
sqldf.show(150)

sqldf.toPandas().to_csv('7.csv')
```

**Output:**



| award | count |
|---|---|
| All-Star Game MVP | 179 |
| Citizenship Award | 16 |
| Defensive Player ... | 11 |
| Sixth Man of the ... | 6 |
| NBA Finals Most V... | 31 |
| Rookie of the Year | 70 |
| Most Improved Player | 59 |
| Most Valuable Player | 20 |
| Executive of the ... | 25 |
| Coach of the Year | 13 |

## Tableau Visualization

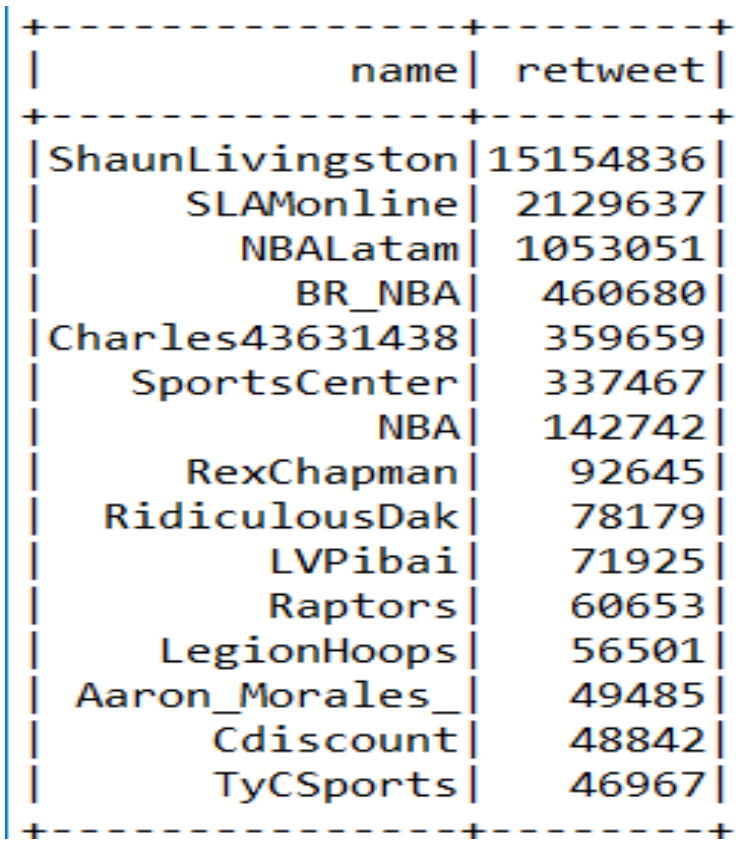


## Query8:

To display the number of retweets from top pages and visualization using pie-chart.

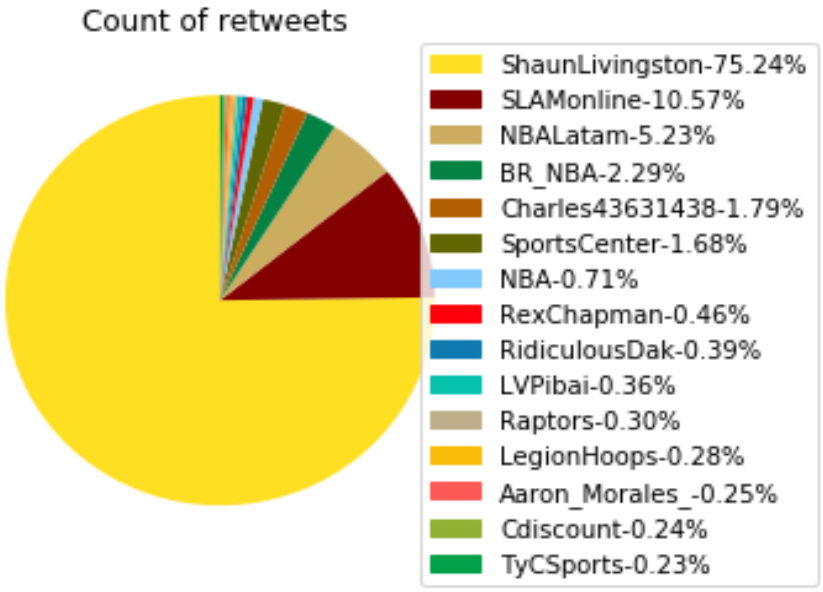
```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

df.createOrReplaceTempView("nba")

sqldf = spark.sql(

  "SELECT name,SUM(cnt) as retweet FROM (SELECT quoted_status.user.screen_name AS name,quoted_status.retweet_count AS cnt FROM nba WHERE quoted_status.retweet_count>0)GROUP BY name ORDER BY retweet DESC LIMIT 15")

sqldf.show(150)
```

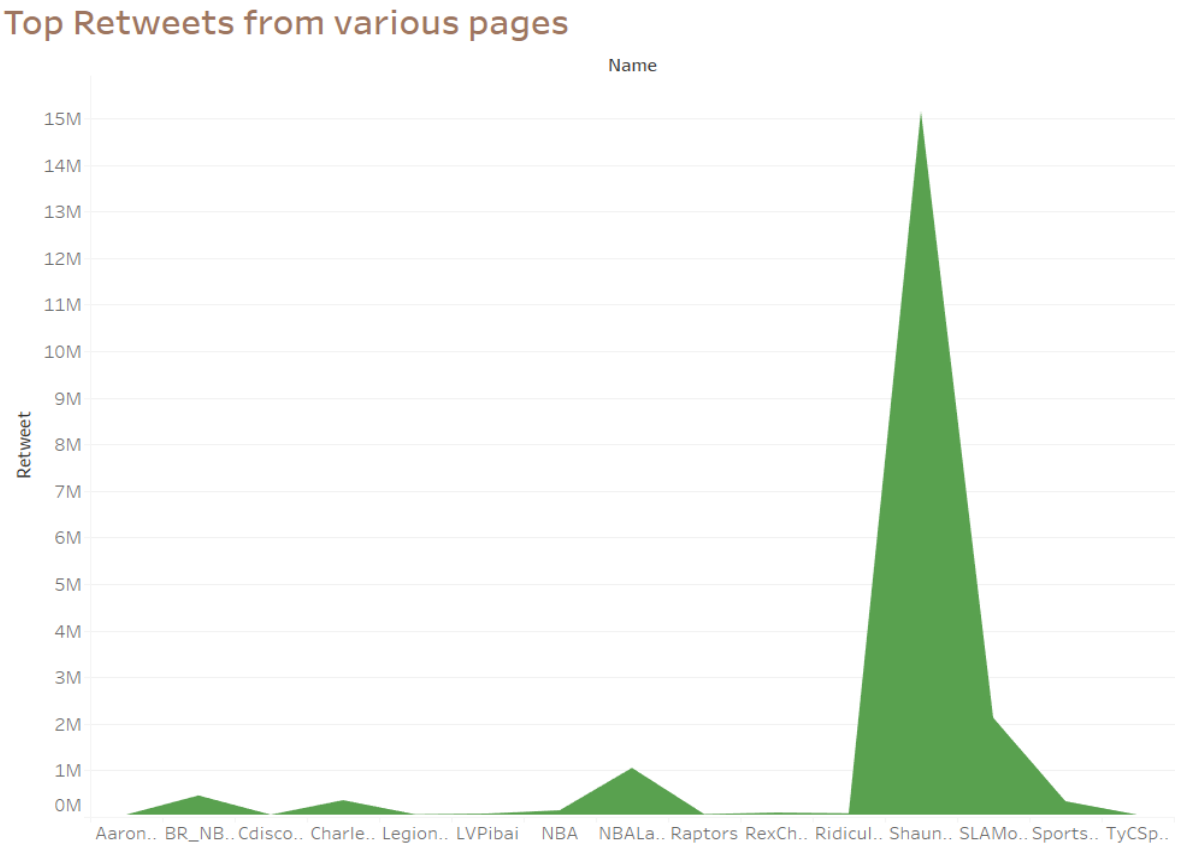
## Output:



| name | retweet |
|---|---|
| ShaunLivingston | 15154836 |
| SLAMonline | 2129637 |
| NBALatam | 1053051 |
| BR_NBA | 460680 |
| Charles43631438 | 359659 |
| SportsCenter | 337467 |
| NBA | 142742 |
| RexChapman | 92645 |
| RidiculousDak | 78179 |
| LVPibai | 71925 |
| Raptors | 60653 |
| LegionHoops | 56501 |
| Aaron_Morales_ | 49485 |
| Cdiscount | 48842 |
| TyCSports | 46967 |

# Tableau Visualization



## Query9:

The list of Top 5 Hashags of NBA 2019 and visualization using bar-graph.

```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")
    words = df.select(
        explode(
            split(df.text, " ")
        ).alias("word")
    )
    def extract_tags(word):
        if word.lower().startswith("#"):
            return word
        else:
            return "nonTag"
    extract_tags_udf = udf(extract_tags, StringType())
    resultDF = words.withColumn("tags", extract_tags_udf(words.word))
    resultDF.createOrReplaceTempView("hashtag_count")
    sqlhash = spark.sql("SELECT Hashtag,\
            Occurrences\
            FROM (SELECT upper(tags) Hashtag,\
            count(*) Occurrences\
            FROM hashtag_count\
            WHERE 1=1\
            AND tags!='nonTag'\
            GROUP BY upper(tags)\
            ORDER BY Occurrences desc, Hashtag asc) limit 5")
```

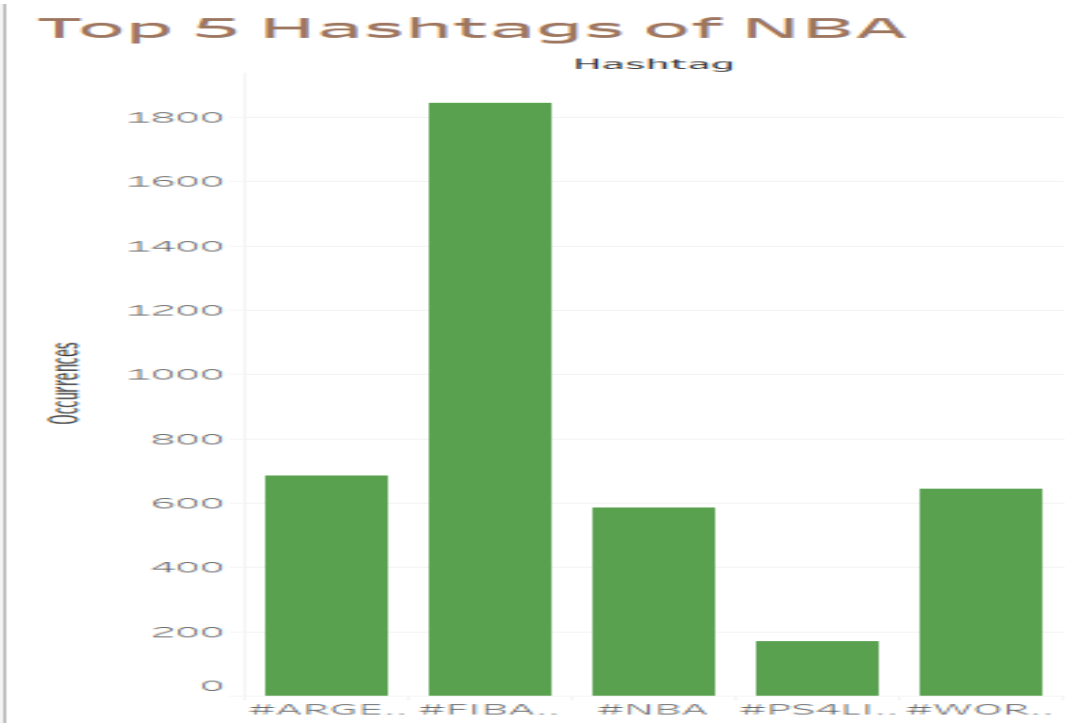
```
sqlhash.show(70)
```

```
sqlhash.toPandas().to_csv('9.csv')
```

**Output:**

| Hashtag | Occurrences |
|---|---|
| #FIBAWC | 1844 |
| #ARGENTINAGOTGAME | 684 |
| #WORLDGOTGAME | 644 |
| #NBA | 586 |
| #PS4LIVE | 169 |

## Tableau Visualization



## Query10:

Player recognition in NBA and the visualization using bar-graph.

```
df=spark.read.json("C:/Users/VamsiDraksharam/PycharmProjects/PB-Vamsi/phase2/data2.json")

df.createOrReplaceTempView("nba")

sqlDF = spark.sql("SELECT 'Jordan Clarkson' as Player, count(*) as Count from nba where text like '%jordan%' and text like '%nba%'\
    UNION\
    SELECT 'Stephen Curry' as Player, count(*) as Count from nba where text like '%curry%' and text like '%nba%'\
    UNION\
    SELECT 'LeBron James' as Player, count(*) as Count from nba where text like '%lebron%' and text like '%nba%'  UNION\
    SELECT 'James Harden' as Player, count(*) as Count from nba where text like '%harden%' and text like '%nba%'  UNION\
    SELECT 'Anthony Davis' as Player, count(*) as Count from nba where text like '%anthony%' and text like '%nba%'")

pd = sqlDF.toPandas()

pd.to_csv('10.csv', index=False)
```

## Output:

| Player | Count |
|---|---|
| Jordan Clarkson | 3 |
| James Harden | 2 |
| LeBron James | 6 |
| Stephen Curry | 2 |
| Anthony Davis | 1 |

## Tableau Visualization