In [1]:

```
import matplotlib
import pandas as pd
from dateutil.parser import *
from sklearn.cluster import KMeans
from sklearn.preprocessing import LabelEncoder
%matplotlib inline
```

In [15]:

```
# Read the CSV File into a Dataframe
events_dataset = './events_recommender/resources/events_preclustering.csv'
```

In [16]:

```
# Load the CSV File into a Pandas Dataframe
events_df = pd.read_csv(events_dataset)
```

In [17]:

```
events_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 790 entries, 0 to 789
Data columns (total 9 columns):
event_edition_id     790 non-null int64
event_name           790 non-null object
event_category       790 non-null object
registration_type    790 non-null object
start_date           790 non-null object
end_date             790 non-null object
venue                772 non-null object
city                 772 non-null object
event_tags           687 non-null object
dtypes: int64(1), object(8)
memory usage: 55.6+ KB
```

In [18]:

```
# Map the start_date to Seasons
def date_to_season(given_dt):
    winter = [12,1,2]
    spring = [3,4,5]
    summer = [6,7,8]
    autumn = [9,10,11]
    try:
        dt = parse(given_dt)
        start_month = dt.month

        if start_month in winter:
            return 'winter'
        elif start_month in spring:
            return 'spring'
        elif start_month in summer:
            return 'summer'
        elif start_month in autumn:
            return 'autumn'
    except Exception as err:
        return 'autumn'
```

In [19]:

```
events_df['season'] = events_df['start_date'].map(date_to_season)
```

In [20]:

```
events_df.count()
```

Out[20]:

```
event_edition_id     790
event_name           790
event_category       790
registration_type    790
start_date           790
end_date             790
venue                772
city                 772
event_tags           687
season               790
dtype: int64
```

## Clustering the Events Dataset

In [21]:

```
# Converting the Categorical Data to Numerical Values
labelEncoder = LabelEncoder()

# Convert event_category
labelEncoder.fit(events_df['event_category'])
events_df['event_category_num'] = labelEncoder.transform(events_df['event_catego
ry'])

# Convert registration_type
labelEncoder.fit(events_df['registration_type'])
events_df['registration_type_num'] = labelEncoder.transform(events_df['registrat
ion_type'])

# Convert season
labelEncoder.fit(events_df['season'])
events_df['season'] = labelEncoder.transform(events_df['season'])

# Drop the column start_date
#events_df = events_df.drop('start_date',axis=1)

# Drop the registration type
#events_df = events_df.drop('registration_type',axis=1)

#events_df = events_df.drop('event_edition_id',axis=1)

events_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 790 entries, 0 to 789
Data columns (total 12 columns):
event_edition_id         790 non-null int64
event_name               790 non-null object
event_category           790 non-null object
registration_type        790 non-null object
start_date               790 non-null object
end_date                 790 non-null object
venue                    772 non-null object
city                     772 non-null object
event_tags               687 non-null object
season                   790 non-null int64
event_category_num       790 non-null int64
registration_type_num    790 non-null int64
dtypes: int64(4), object(8)
memory usage: 74.1+ KB
```

In [22]:

```
# Do the Clustering
tocluster_df = events_df[['event_category_num','registration_type_num','season'
]]
tocluster_df.info()
kmeans = KMeans(n_clusters=7)
kmeans.fit(tocluster_df)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 790 entries, 0 to 789
Data columns (total 3 columns):
event_category_num       790 non-null int64
registration_type_num    790 non-null int64
season                   790 non-null int64
dtypes: int64(3)
memory usage: 18.6 KB
```

Out[22]:

```
KMeans(algorithm='auto', copy_x=True, init='k-means++', max_iter=30
0,
       n_clusters=7, n_init=10, n_jobs=None, precompute_distances='a
uto',
       random_state=None, tol=0.0001, verbose=0)
```

In [23]:

```
cluster_labels = kmeans.labels_
events_df['cluster'] = cluster_labels
events_df.info()
```

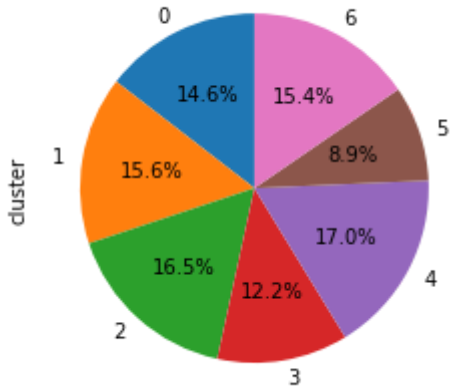
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 790 entries, 0 to 789
Data columns (total 13 columns):
event_edition_id         790 non-null int64
event_name               790 non-null object
event_category           790 non-null object
registration_type        790 non-null object
start_date               790 non-null object
end_date                 790 non-null object
venue                    772 non-null object
city                     772 non-null object
event_tags               687 non-null object
season                   790 non-null int64
event_category_num       790 non-null int64
registration_type_num    790 non-null int64
cluster                  790 non-null int32
dtypes: int32(1), int64(4), object(8)
memory usage: 77.2+ KB
```

In [24]:

```
# Group the Events by the Cluster
events_df.groupby('cluster')['cluster'].count().plot.pie(autopct='%1.1f%%',start
angle=90)
```

Out[24]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x7ffac9fd3b38>
```




In [25]:

```
# Save the Dataframe to CSV
events_clusters = '/home/ubuntu/projects/PersonalSpace/Eventjini/retechnicaltas
k/events_clusters.csv'

events_df.to_csv(events_clusters,index=False)
```