3.2 w2v_minibatchkmeans

October 18, 2017

In [1]:
```
import pandas as pd
import numpy as np
from sklearn.manifold import TSNE
from sklearn.cluster import MiniBatchKMeans
from sklearn import metrics
from sklearn.cluster import MiniBatchKMeans, KMeans
```

In [2]:
```
df = pd.read_pickle('./pickles/my_df.pickle')
```

In [3]:
```
#traverse df[vector] and finish with a matrix with all the words with it's values
alist = []
for i in range(len(df['vector'])):
    alist.append(np.array(list(df['vector'][i].values())))
arr = np.concatenate(alist)
```

In [4]:
```
arr.shape
```

Out[4]:
```
(592, 300)
```

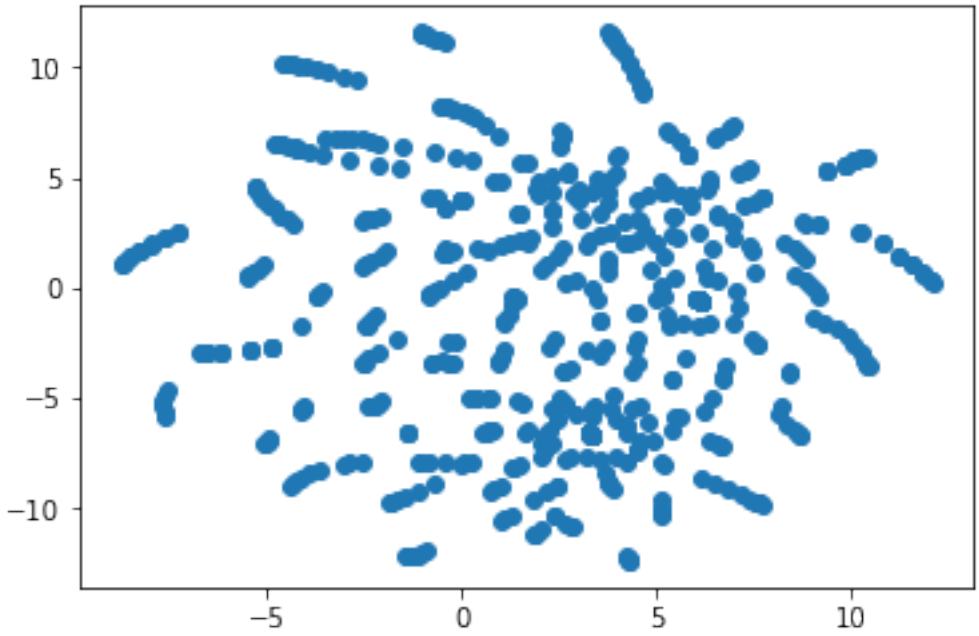
In [5]:
```
%pylab inline
```

```
Populating the interactive namespace from numpy and matplotlib
```

In [7]:
```
# We reduce the dimensions of the w2v to something we can represent
X_tsne = TSNE(learning_rate=200, perplexity=50).fit_transform(arr)
X_tsne.shape
```

Out[7]:
```
(592, 2)
```

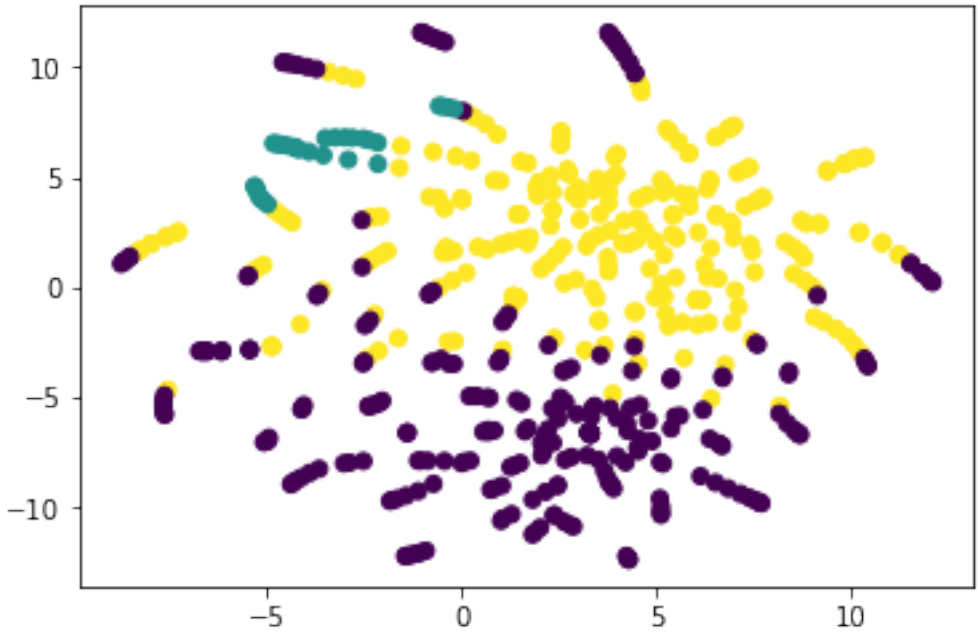
In [8]:
```
# Visualition of what TSNE gets from the dataset
plt.scatter(X_tsne[:, 0], X_tsne[:, 1])
plt.show()
```



In [9]:
```
# We try to
kmeans = MiniBatchKMeans(n_clusters=3, random_state=10)
labels = kmeans.fit_predict(arr)
```

In [10]:
```
plt.scatter(X_tsne[:,0], X_tsne[:,1], c=labels)
```

Out[10]:
```
<matplotlib.collections.PathCollection at 0x7ff735855c50>
```



0.1 K MEANS

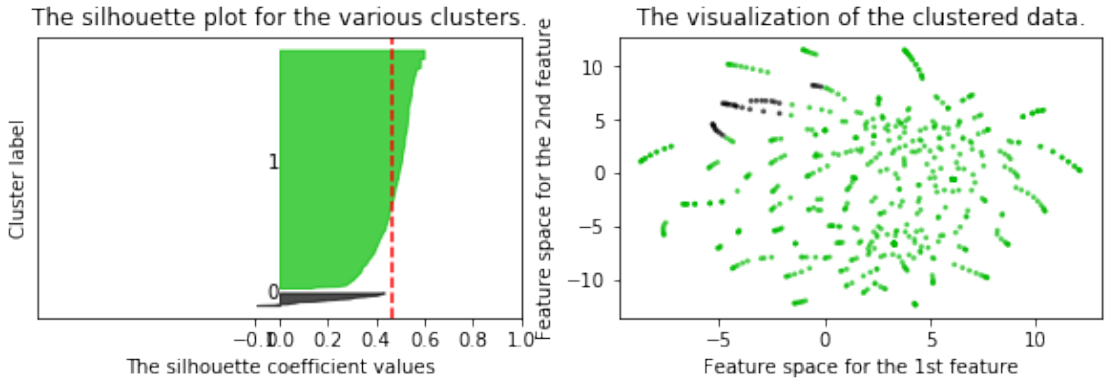
dfdfdf

```
In [11]: range_n_clusters = [2, 3, 4, 6, 8, 12]

In [12]: for n_clusters in range_n_clusters:

             fig, (ax1, ax2) = plt.subplots(1, 2)
             fig.set_size_inches(10, 3)
             ax1.set_xlim([-1, 1]) # rango de silhouette de -1 a 1

             kmeans = MiniBatchKMeans(n_clusters = n_clusters, random_state=10)
             labels = kmeans.fit_predict(arr)

             #For all the clusters we have we calculate the mean between all of them
             silhouette_avg = metrics.silhouette_score(arr, labels)

             print("For n_clusters =", n_clusters, "The average silhouette_score is :", silhoue

             # The metric for each cluster
             sample_silhouette_values = metrics.silhouette_samples(arr, labels)

             y_lower = 10
             for i in range(n_clusters):
                 # Aggregate the silhouette scores for samples belonging to
                 # cluster i, and sort them
                 ith_cluster_silhouette_values = sample_silhouette_values[labels == i]

                 ith_cluster_silhouette_values.sort()

                 size_cluster_i = ith_cluster_silhouette_values.shape[0]
                 y_upper = y_lower + size_cluster_i

                 # Colorizing and plotting the barplot of 1st plot
                 color = cm.spectral(float(i) / n_clusters)
                 ax1.fill_betweenx(np.arange(y_lower, y_upper), 0, ith_cluster_silhouette_valu

                 # Label the silhouette plots with their cluster numbers at the middle
                 ax1.text(-0.05, y_lower + 0.5 * size_cluster_i, str(i))

                 # Compute the new y_lower for next plot
                 y_lower = y_upper + 10  # 10 for the 0 samples
             ax1.set_title("The silhouette plot for the various clusters.")
             ax1.set_xlabel("The silhouette coefficient values")
```

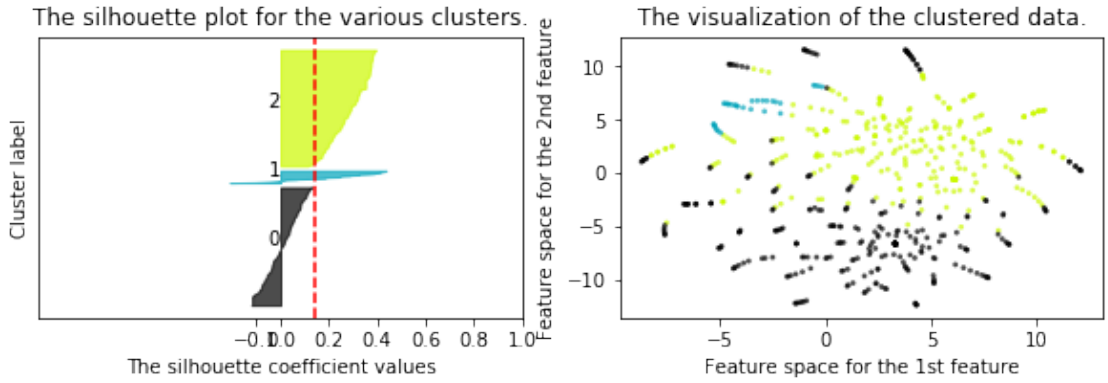
```
            ax1.set_ylabel("Cluster label")

            # The vertical line for average silhouette score of all the values
            ax1.axvline(x=silhouette_avg, color="red", linestyle="--")

            ax1.set_yticks([])  # Clear the yaxis labels / ticks
            ax1.set_xticks([-0.1, 0, 0.2, 0.4, 0.6, 0.8, 1])

            # 2nd plot showing the actual clusters formed
            colors = cm.spectral(labels.astype(float) / n_clusters)
            ax2.scatter(X_tsne[:, 0], X_tsne[:, 1], marker='.', s=30, lw=0, alpha=0.7, c=colo

            ax2.set_title("The visualization of the clustered data.")
            ax2.set_xlabel("Feature space for the 1st feature")
            ax2.set_ylabel("Feature space for the 2nd feature")

            ax2.figure.subplots_adjust(bottom=0.2)
            ax2.figure.savefig('./figures/w2v_500_cluster%d_%f'% (n_clusters, silhouette_avg)

            plt.show()
```

```
/home/set92/anaconda3/lib/python3.6/site-packages/sklearn/metrics/pairwise.py:256: RuntimeWarni
  return distances if squared else np.sqrt(distances, out=distances)
```

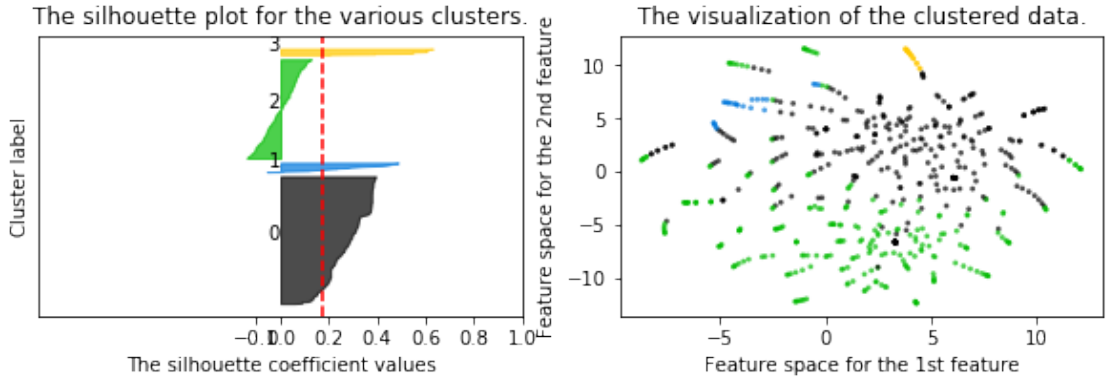
```
For n_clusters = 2 The average silhouette_score is : 0.461785
```



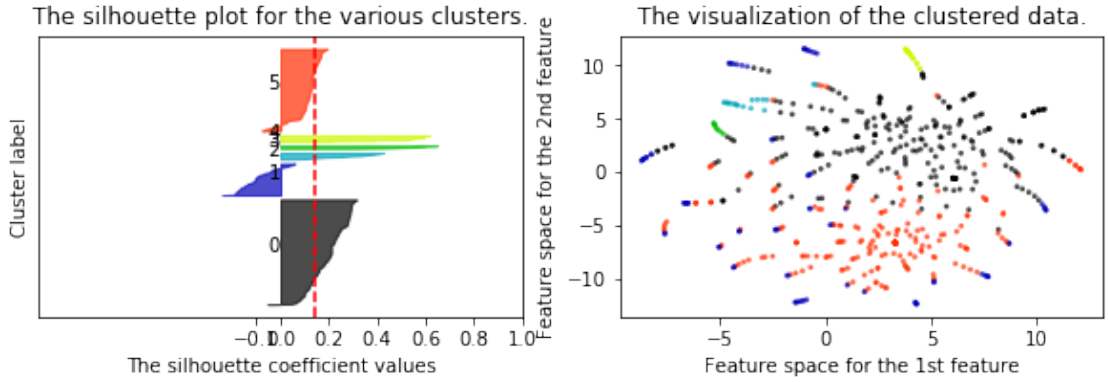

```
For n_clusters = 3 The average silhouette_score is : 0.144946
```



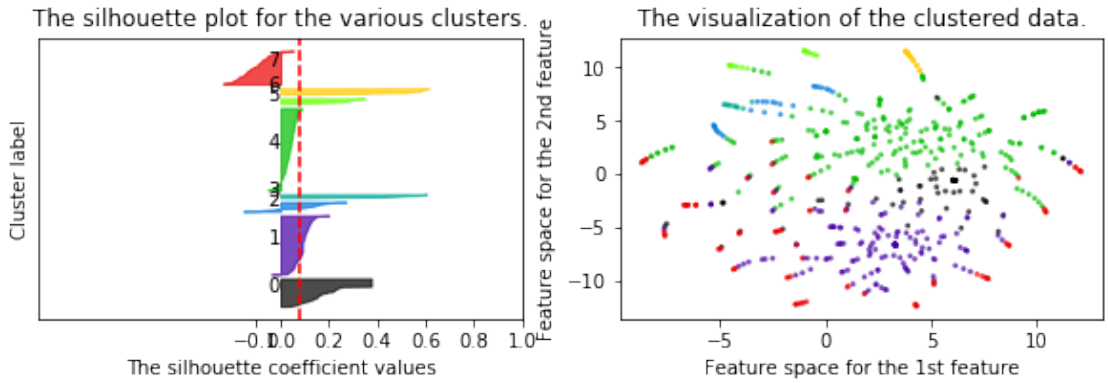

```
For n_clusters = 4 The average silhouette_score is : 0.169434
```



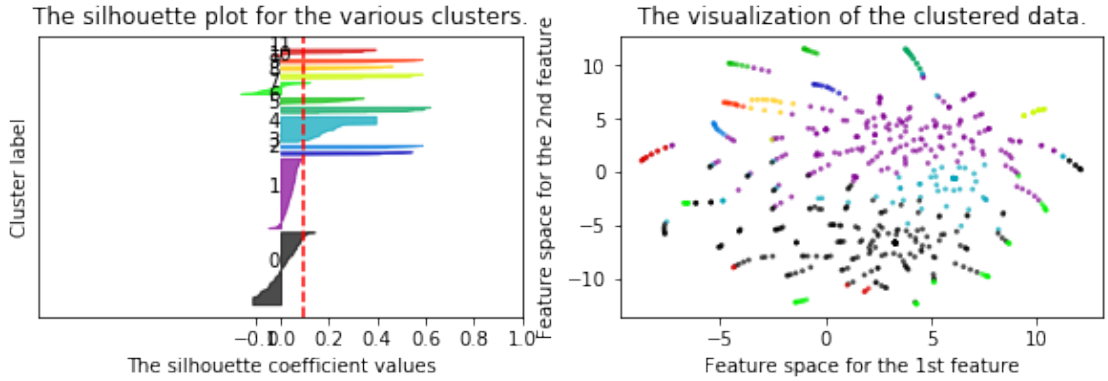

```
For n_clusters = 6 The average silhouette_score is : 0.141843
```



```
For n_clusters = 8 The average silhouette_score is : 0.0762464
```




```
For n_clusters = 12 The average silhouette_score is : 0.0973951
```



In [ ]:

In [ ]: