

In [24]:

```
import random
import math
import numpy as np

def random_centers(data,k):
    data_ = np.array(data)
    centres_list = []
    for x in range(0,k):
        temp_rand = np.random.randint( 0,high = 1999)
        temp = data_[temp_rand]
        centres_list.append(temp)
        data_ = np.delete(data_,temp,axis = 0)
    return((centres_list))

def assign_data_centers(data, k,centres):
    thePartition = [[] for _ in range(0,k)] # list of k empty lists

    c = np.array(centres)
    dp = np.array(data)

    for a in dp:
        temp_norm = np.linalg.norm((c-a),axis =1 )
        minn = temp_norm.min()
        temp_list = list(temp_norm)
        thePartition[temp_list.index(minn)].append(a)

    return thePartition

def revalaute_centres(data_with_centres,k):
    data = data_with_centres
    new_centres=[]
    for x in data:
        temp = np.array(x)
        temp_m = temp.mean(axis = 0)
        new_centres.append(temp_m)
    return(new_centres)
```

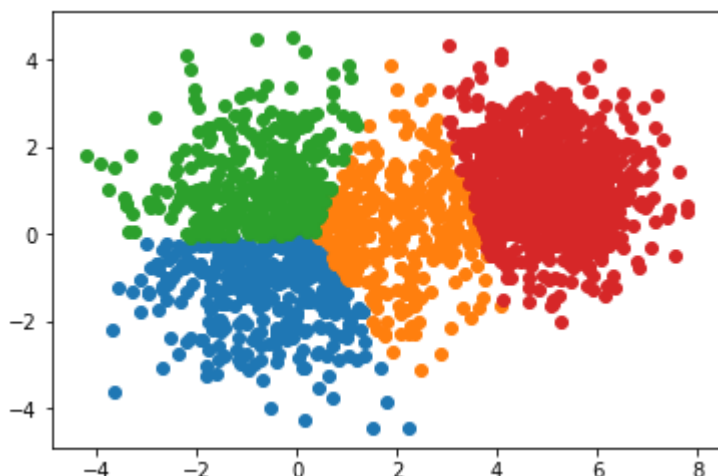
In [53]:

```
import pandas as pd
data = pd.read_csv('ShapedData.csv',header = None)
```


[illegible]

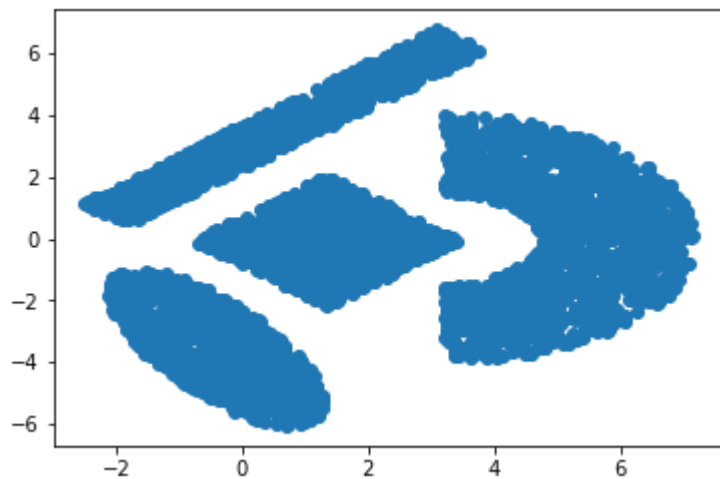
In [59]:

```
import matplotlib.pyplot as plt
plt.plot()
for i in D_C_2:
    plt.scatter(pd.DataFrame(i)[0],pd.DataFrame(i)[1])
plt.show()
```



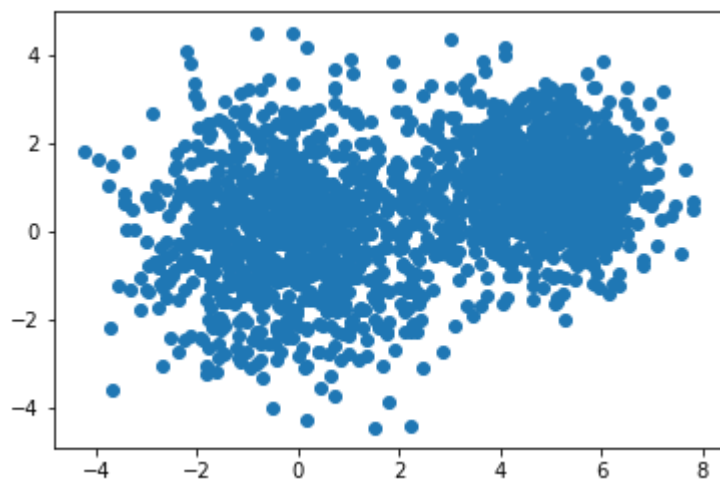
In [60]:

```
plt.scatter(data[0],data[1])  
plt.show()
```



In [61]:

```
plt.scatter(data_2[0],data_2[1])  
plt.show()
```



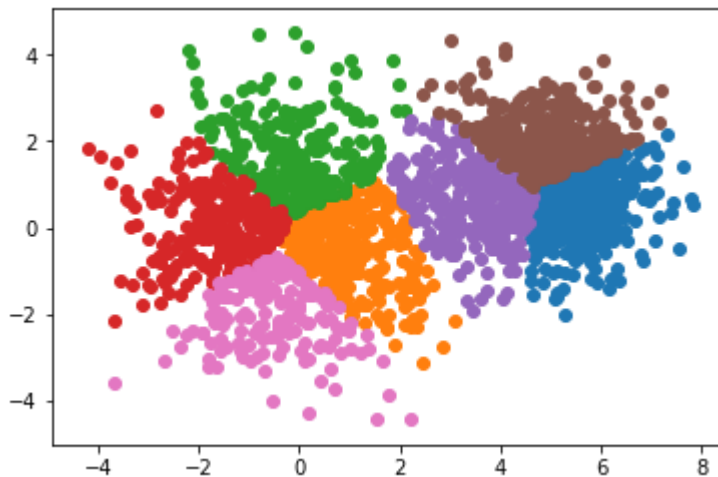
[illegible]

```

    if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: FutureWarning: in the future negative indices will not be ignored by `numpy.delete`.
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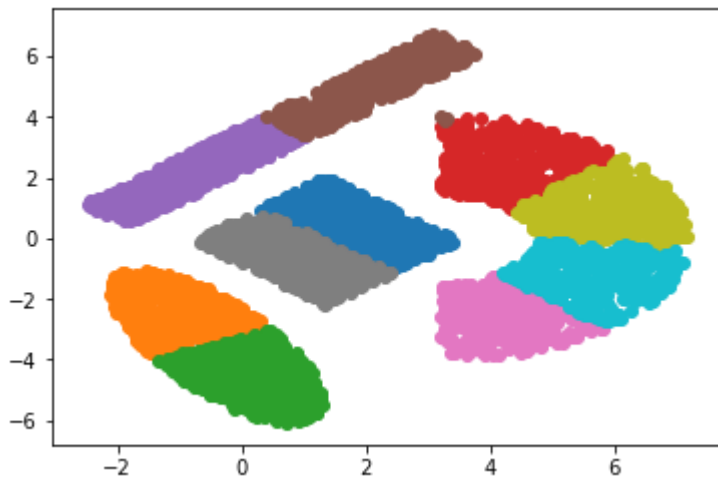
[illegible]

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[illegible]

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