# 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)
```

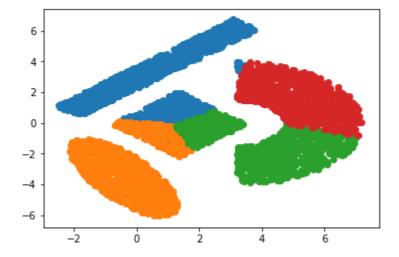
```
In [47]:
```

```
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Depre
cationWarning: using a non-integer array as obj in delete will result in an
error in the future
  if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Futur
eWarning: in the future negative indices will not be ignored by `numpy.delet
e`.
  if sys.path[0] == '':
```

#### In [48]:

```
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 [57]:

```
import pandas as pd
data_2 = pd.read_csv('clustering.csv', header=None)
```

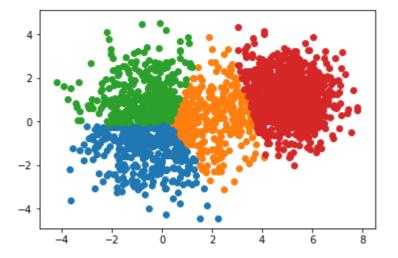
```
In [58]:
```

C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel\_launcher.py:12: Depre
cationWarning: using a non-integer array as obj in delete will result in an
error in the future
 if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel\_launcher.py:12: Futur
eWarning: in the future negative indices will not be ignored by `numpy.delet
e`.
 if sys.path[0] == '':

# In [59]:

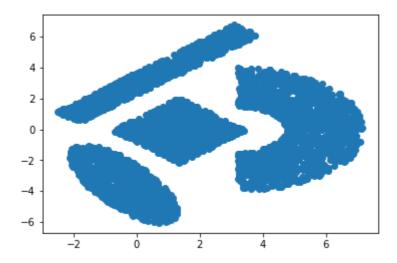
```
import matplotlib.pyplot as plt
plt.plot()
for i in D_C_2:
    plt.scatter(pd.DataFrame(i)[0],pd.DataFrame(i)[1])

plt.show()
```



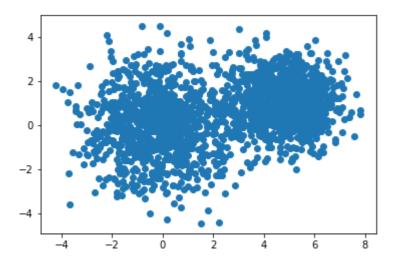
# In [60]:

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



In [61]:

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



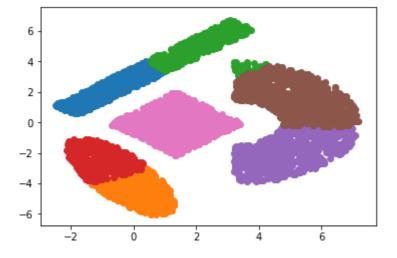
```
In [62]:
```

```
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Depre
cationWarning: using a non-integer array as obj in delete will result in an
error in the future
  if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Futur
eWarning: in the future negative indices will not be ignored by `numpy.delet
e`.
  if sys.path[0] == '':
```

#### In [63]:

```
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()
```



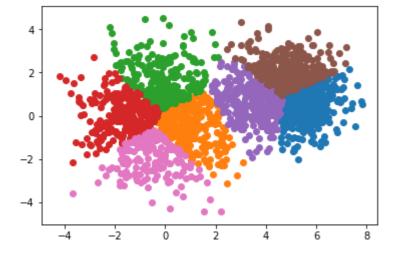
```
In [64]:
```

```
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Depre
cationWarning: using a non-integer array as obj in delete will result in an
error in the future
  if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Futur
eWarning: in the future negative indices will not be ignored by `numpy.delet
e`.
  if sys.path[0] == '':
```

## In [65]:

```
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()
```



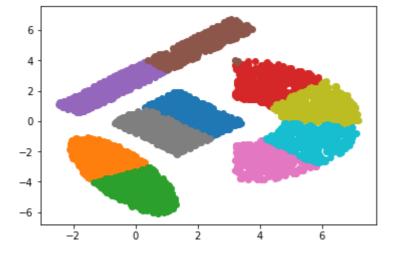
```
In [66]:
```

```
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Depre
cationWarning: using a non-integer array as obj in delete will result in an
error in the future
  if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel_launcher.py:12: Futur
eWarning: in the future negative indices will not be ignored by `numpy.delet
e`.
  if sys.path[0] == '':
```

## In [67]:

```
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()
```



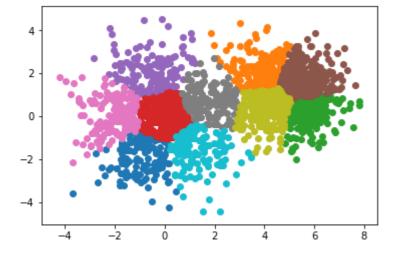
```
In [68]:
```

C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel\_launcher.py:12: Depre
cationWarning: using a non-integer array as obj in delete will result in an
error in the future
 if sys.path[0] == '':
C:\Users\Karthik\Anaconda3\lib\site-packages\ipykernel\_launcher.py:12: Futur
eWarning: in the future negative indices will not be ignored by `numpy.delet
e`.
 if sys.path[0] == '':

## In [69]:

```
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 [ ]: