KNN-Algorithm

In [1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [3]:

```
data = pd.read_csv('activity_8.csv')
datadata.shape
```

Out[3]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

150 rows × 5 columns

In [4]:

```
data.shape
```

Out[4]:

```
(150, 5)
```

In [5]:

```
data.head()
```

Out[5]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

In [6]:

```
data.describe()
```

Out[6]:

	sepal_length	sepal_width	petal_length	petal_width
count	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.054000	3.758667	1.198667
std	0.828066	0.433594	1.764420	0.763161
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.350000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

In [7]:

```
data.groupby('species').size()
```

Out[7]:

```
species
setosa        50
versicolor    50
virginica     50
dtype: int64
```

In [8]:

```
feature_columns = ['sepal_length', 'sepal_width', 'petal_length','petal_width']
X = data[feature_columns].values
y = data['species'].values
```

In [9]:

```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
y = le.fit_transform(y)
```

In [10]:

```
from sklearn.model_selection import train_test_split
```

In [12]:

```
train,test=train_test_split(data,test_size=0.2,random_state=0)
```

In [13]:

```
from sklearn.neighbors import KNeighborsClassifier as KNC
```

In [14]:

```
neigh=KNC(n_neighbors=3)
neigh.fit(train.iloc[:,0:4],train.iloc[:,4])
train_predict=neigh.predict(train.iloc[:,0:4])
pd.crosstab(train_predict,train.iloc[:,4])
train_acc=(39+34+41)/(39+34+41+3+3)
train_acc
```

Out[14]:

```
0.95
```

In [15]:

```
train_acc=np.mean(neigh.predict(train.iloc[:,0:4])==train.iloc[:,4])
train_acc
```

Out[15]:

```
0.95
```

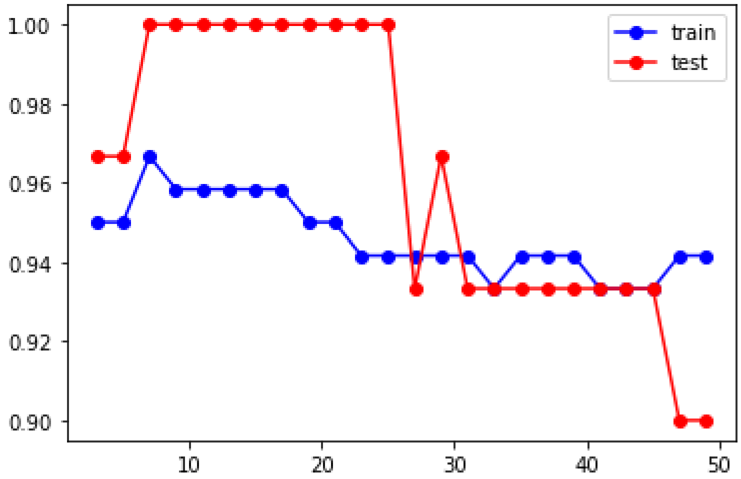
In [16]:

```
acc=[]
for i in range(3,50,2):
    neigh=KNC(n_neighbors=i)
    neigh.fit(train.iloc[:,0:4],train.iloc[:,4])
    train_acc=np.mean(neigh.predict(train.iloc[:,0:4])==train.iloc[:,4])
    test_acc=np.mean(neigh.predict(test.iloc[:,0:4])==test.iloc[:,4])
    acc.append([train_acc,test_acc])

plt.plot(np.arange(3,50,2),[i[0] for i in acc],'bo-')
plt.plot(np.arange(3,50,2),[i[1] for i in acc],'ro-')
plt.legend(['train','test'])
```

Out[16]:

```
<matplotlib.legend.Legend at 0x1eeada42a90>
```



In [17]:

```
neigh8=KNC(n_neighbors=8)
neigh8.fit(train.iloc[:,0:4],train.iloc[:,4])

train_acc8=np.mean(neigh8.predict(train.iloc[:,0:4])==train.iloc[:,4])
train_acc8
test_acc8=np.mean(neigh8.predict(test.iloc[:,0:4])==test.iloc[:,4])
test_acc8
```

Out[17]:

```
1.0
```

In [ ]: