評估結果 & 調整參數

- **自主練習：**

  希望能比較 k = 1, 3, 5, ..., 49 的結果，並將結果視覺化以及找出最好的 k 值。

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In [11]:
```
from sklearn.model_selection import cross_val_score

neighbors = [x for x in range(1,50) if x%2!=0]

cv_scores = []


for k in neighbors:
    knn = KNeighborsClassifier(n_neighbors=k)
    scores = cross_val_score(knn, X_train, y_train, cv=10,
                             scoring='accuracy')
    cv_scores.append(scores.mean())

# changing to misclassification error
MSE = [1 - x for x in cv_scores]

# determining best k
optimal_k = neighbors[MSE.index(min(MSE))]
print("The optimal number of neighbors is %d" % optimal_k)
```

```
The optimal number of neighbors is 5
```

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In [12]:
```
import matplotlib.pyplot as plt
import seaborn as sns
# plot misclassification error vs k
plt.plot(neighbors, MSE)
plt.xlabel('Number of Neighbors K')
plt.ylabel('Misclassification Error')
plt.show()
```