In [5]:

```
import pandas as pd
```

In [6]:

```
import numpy as np
```

In [8]:

```
import matplotlib.pyplot as plt
```

In [9]:

```
%matplotlib inline
```

In [10]:

```
diabetes=pd.read_csv("C:/Users/HP/Downloads/diabetes.csv")
```

In [11]:

```
print(diabetes.columns)
```

```
Index(['Pregnancies', 'Glucose', 'BloodPressure', 'SkinThickness', 'Insulin',
       'BMI', 'DiabetesPedigreeFunction', 'Age', 'Outcome'],
      dtype='object')
```

In [12]:

```
diabetes.head()
```

Out[12]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
0	6	148	72	35	0	33.6	0.627	50	1
1	1	85	66	29	0	26.6	0.351	31	0
2	8	183	64	0	0	23.3	0.672	32	1
3	1	89	66	23	94	28.1	0.167	21	0
4	0	137	40	35	168	43.1	2.288	33	1

In [13]:

```
print("dimension of diabetes data:{}".format(diabetes.shape))
```

```
dimension of diabetes data:(768, 9)
```

In [14]:

```
print(diabetes.groupby('Outcome').size())
```

```
Outcome
0    500
1    268
dtype: int64
```

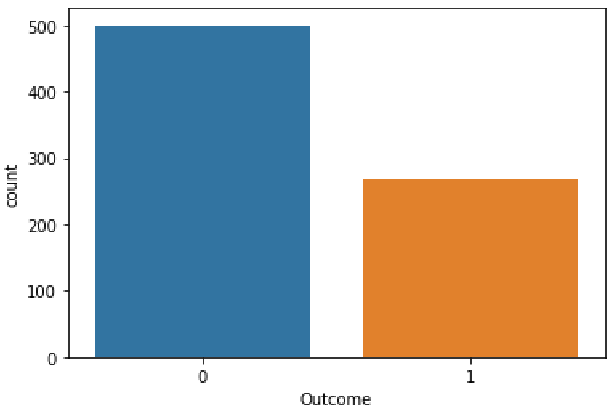
In [15]:

```
import seaborn as sns
```

```
sns.countplot(diabetes['Outcome'],label="Count")
```

Out[15]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x232662fb948>
```



In [16]:

```
diabetes.info()
```

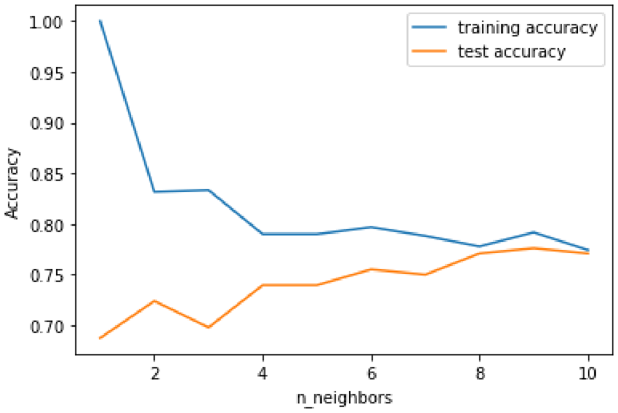
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 768 entries, 0 to 767
Data columns (total 9 columns):
 #   Column                    Non-Null Count  Dtype  
---  ------                    --------------  -----  
 0   Pregnancies               768 non-null    int64  
 1   Glucose                   768 non-null    int64  
 2   BloodPressure             768 non-null    int64  
 3   SkinThickness             768 non-null    int64  
 4   Insulin                   768 non-null    int64  
 5   BMI                       768 non-null    float64
 6   DiabetesPedigreeFunction  768 non-null    float64
 7   Age                       768 non-null    int64  
 8   Outcome                   768 non-null    int64  
dtypes: float64(2), int64(7)
memory usage: 54.1 KB
```

In [17]:

```
#k-Nearest Neighbors(kNN)
```

In [24]:

```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(diabetes.loc[:, diabetes.columns != 'Outcome'],
diabetes['Outcome'], stratify=diabetes['Outcome'], random_state=66)
from sklearn.neighbors import KNeighborsClassifier
training_accuracy = []
test_accuracy = []
# try n_neighbors from 1 to 10
neighbors_settings = range(1, 11)
for n_neighbors in neighbors_settings:
    # build the model
    knn = KNeighborsClassifier(n_neighbors=n_neighbors)
    knn.fit(X_train, y_train)
    # record training set accuracy
    training_accuracy.append(knn.score(X_train, y_train))
    # record test set accuracy
    test_accuracy.append(knn.score(X_test, y_test))
plt.plot(neighbors_settings, training_accuracy, label="training accuracy")
plt.plot(neighbors_settings, test_accuracy, label="test accuracy")
plt.ylabel("Accuracy")
plt.xlabel("n_neighbors")
plt.legend()
plt.savefig('knn_compare_model')
```



In [25]:

```
knn = KNeighborsClassifier(n_neighbors=9)
knn.fit(X_train, y_train)
print('Accuracy of K-NN classifier on training set: {:.2f}'.format(knn.score(X_train, y_train)))
print('Accuracy of K-NN classifier on test set: {:.2f}'.format(knn.score(X_test, y_test)))
```

```
Accuracy of K-NN classifier on training set: 0.79
Accuracy of K-NN classifier on test set: 0.78
```

In [ ]: