In [3]:

```
import pandas as pd
import seaborn as sns
```

In [4]:

```
df = pd.read_csv("C:\\Users\\Omkar\\Downloads\\diabetes.csv")
```

In [5]:

```
print(df.head())
```

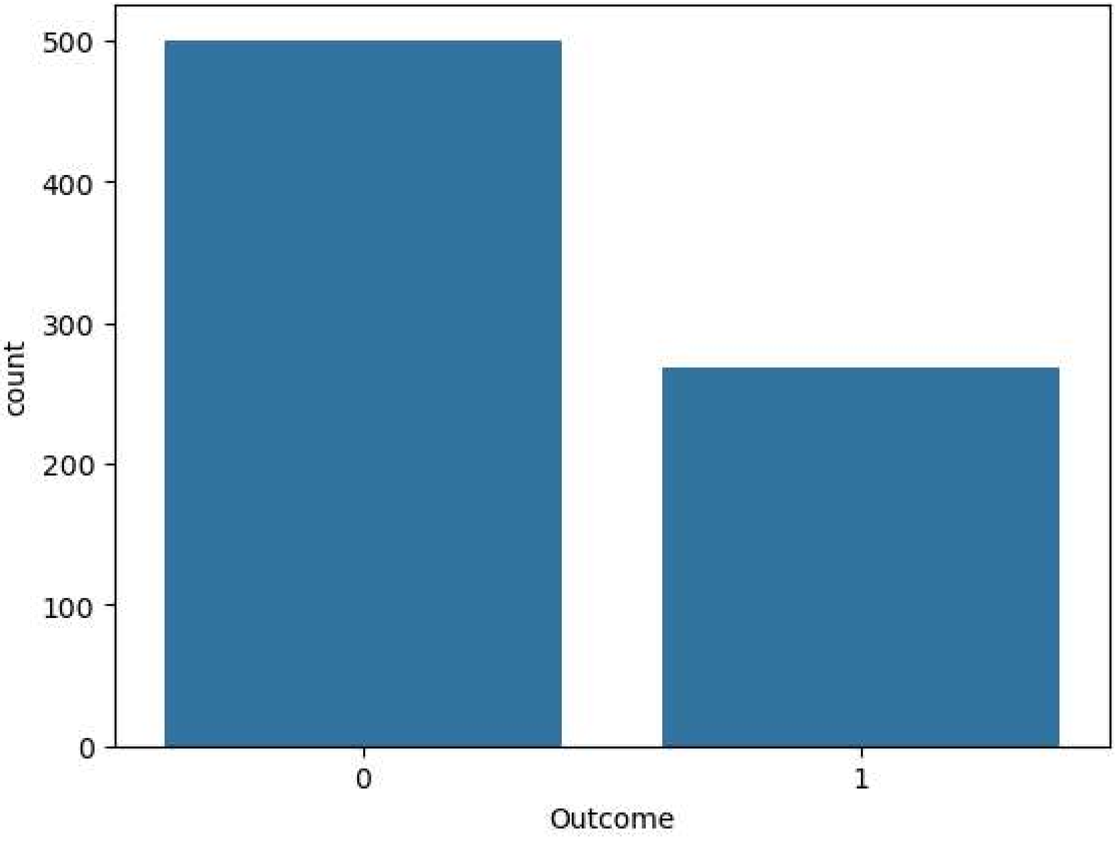
```
   Pregnancies  Glucose  BloodPressure  SkinThickness  Insulin   BMI  \
0            6      148             72             35        0  33.6   
1            1       85             66             29        0  26.6   
2            8      183             64              0        0  23.3   
3            1       89             66             23       94  28.1   
4            0      137             40             35      168  43.1   

   Pedigree  Age  Outcome  
0     0.627   50        1  
1     0.351   31        0  
2     0.672   32        1  
3     0.167   21        0  
4     2.288   33        1  
```

In [6]:

```
x = df.drop('Outcome', axis=1)
y = df['Outcome']
```

In [7]:

```
sns.countplot(x=y)
plt.show()
```



In [8]:

```
print(y.value_counts())
```

```
Outcome
0    500
1    268
Name: count, dtype: int64
```

In [9]:

```
from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler()
x_scaled = scaler.fit_transform(x)
```

In [10]:

```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(
x_scaled,y,random_state=0,test_size=0.25)
```

In [11]:

```
x.shape
```

Out[11]:

```
(768, 8)
```

In [12]:

```
x_train.shape
```

Out[12]:

```
(576, 8)
```

In [13]:

```
x_test.shape
```

Out[13]:

```
(192, 8)
```

In [14]:

```
from sklearn.neighbors import KNeighborsClassifier
```

In [15]:

```
knn = KNeighborsClassifier(n_neighbors =5)
```

In [16]:

```
knn.fit(x_train,y_train)
```

Out[16]:

```
▾ KNeighborsClassifier i ?
KNeighborsClassifier()
```

In [17]:

```
from sklearn.metrics import accuracy_score,ConfusionMatrixDisplay
from sklearn.metrics import classification_report
```

In [18]:

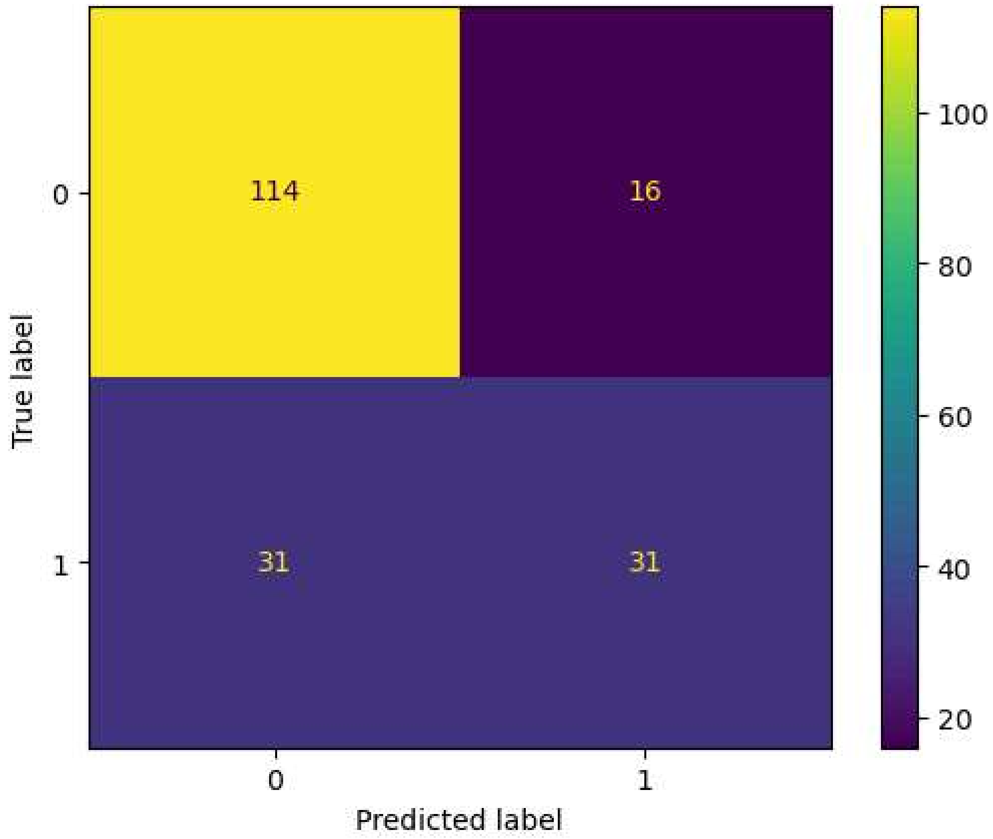
```
y_pred = knn.predict(x_test)
```

In [19]:

```
ConfusionMatrixDisplay.from_predictions(y_test,y_pred)
```

Out[19]:

```
<sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x194abac55b0
>
```



In [20]:
```
print(classification_report(y_test,y_pred))
```

```
              precision    recall  f1-score   support

           0       0.79      0.88      0.83       130
           1       0.66      0.50      0.57        62

    accuracy                           0.76       192
   macro avg       0.72      0.69      0.70       192
weighted avg       0.75      0.76      0.75       192
```

In [21]:
```
import matplotlib.pyplot as plt
import numpy as np
```

In [ ]:
```
error = []
for k in range(1,41):
    knn = KNeighborsClassifier(n_neighbors=k)
    knn.fit(x_train,y_train)
    pred=knn.predict(x_test)
 error.append(np.mean(pred
```