```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score, mean_squared_error
from sklearn.svm import SVC
from sklearn.ensemble import RandomForestClassifier
from sklearn.preprocessing import StandardScaler
from xgboost import XGBClassifier


import warnings
warnings.simplefilter(action="ignore")
```

```
df = pd.read_csv("/content/Employee.csv")
df.head()
```

	Education	JoiningYear	City	PaymentTier	Age	Gender	EverBenched	ExperienceInCurrentDomain	LeaveOrNot
0	Bachelors	2017	Bangalore	3	34	Male	No	0	0
1	Bachelors	2013	Pune	1	28	Female	No	3	1
2	Bachelors	2014	New Delhi	3	38	Female	No	2	0
3	Masters	2016	Bangalore	3	27	Male	No	5	1
4	Masters	2017	Pune	3	24	Male	Yes	2	1

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4653 entries, 0 to 4652
Data columns (total 9 columns):
 #   Column                     Non-Null Count  Dtype 
---  ------                     --------------  ----- 
 0   Education                  4653 non-null   object
 1   JoiningYear                4653 non-null   int64 
 2   City                       4653 non-null   object
 3   PaymentTier                4653 non-null   int64 
 4   Age                        4653 non-null   int64 
 5   Gender                     4653 non-null   object
 6   EverBenched                4653 non-null   object
 7   ExperienceInCurrentDomain  4653 non-null   int64 
 8   LeaveOrNot                 4653 non-null   int64 
dtypes: int64(5), object(4)
memory usage: 327.3+ KB
```

```
df.isnull().sum()
```

	0
Education	0
JoiningYear	0
City	0
PaymentTier	0
Age	0
Gender	0
EverBenched	0
ExperienceInCurrentDomain	0
LeaveOrNot	0

dtype: int64

```
df.describe()
```

	JoiningYear	PaymentTier	Age	ExperienceInCurrentDomain	LeaveOrNot
count	4653.000000	4653.000000	4653.000000	4653.000000	4653.000000
mean	2015.062970	2.698259	29.393295	2.905652	0.343864
std	1.863377	0.561435	4.826087	1.558240	0.475047
min	2012.000000	1.000000	22.000000	0.000000	0.000000
50%	2015.000000	3.000000	28.000000	3.000000	0.000000
75%	2017.000000	3.000000	32.000000	4.000000	1.000000
max	2018.000000	3.000000	41.000000	7.000000	1.000000

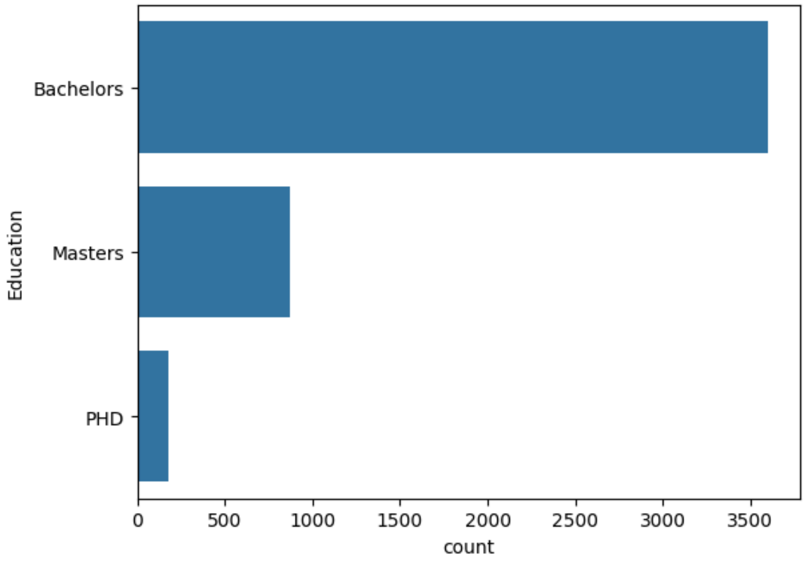
```
df["Education"].value_counts()
```

Education	count
Bachelors	3601
Masters	873
PHD	179

dtype: int64

```
sns.countplot(df["Education"])
```

```
<Axes: xlabel='count', ylabel='Education'>
```



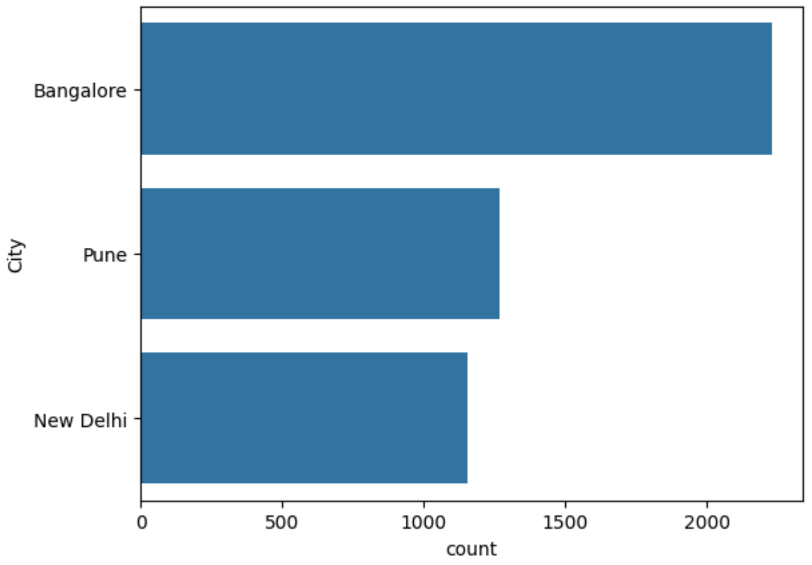
```
df["City"].value_counts()
```

City	count
Bangalore	2228
Pune	1268
New Delhi	1157

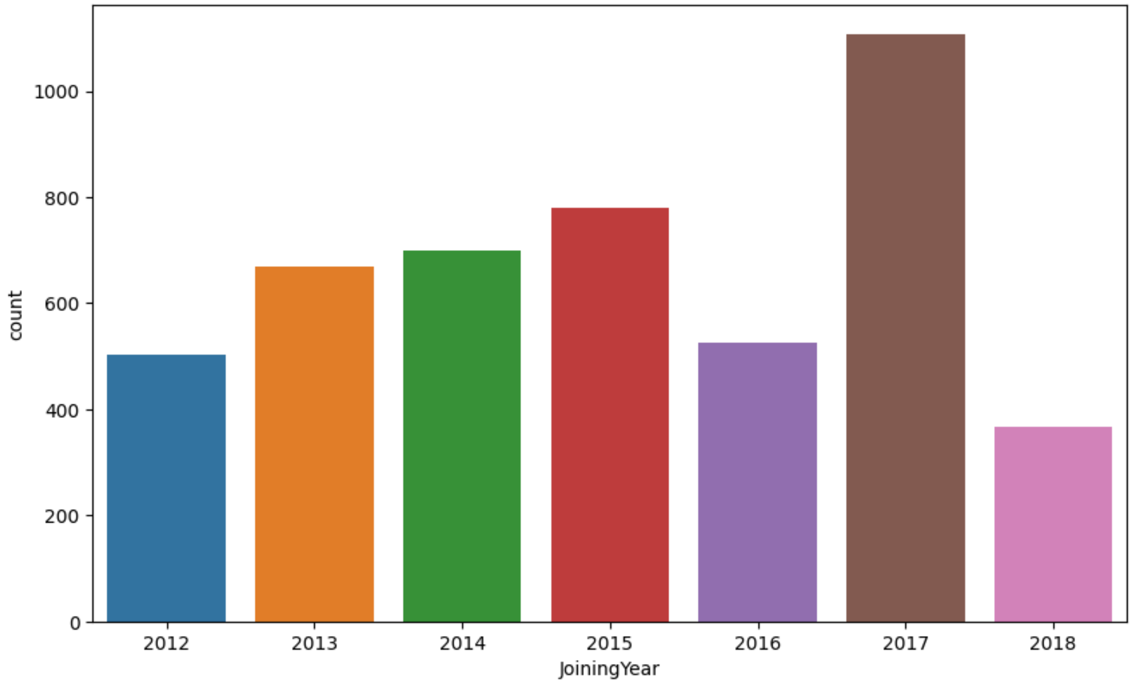
dtype: int64

```
sns.countplot(df["City"])
```

```
<Axes: xlabel='count', ylabel='City'>
```



```
plt.figure(figsize=(10,6))
sns.countplot(
    x="JoiningYear",
    data=df,
    hue="JoiningYear",
    palette="tab10",
    legend=False
)
plt.show()
```



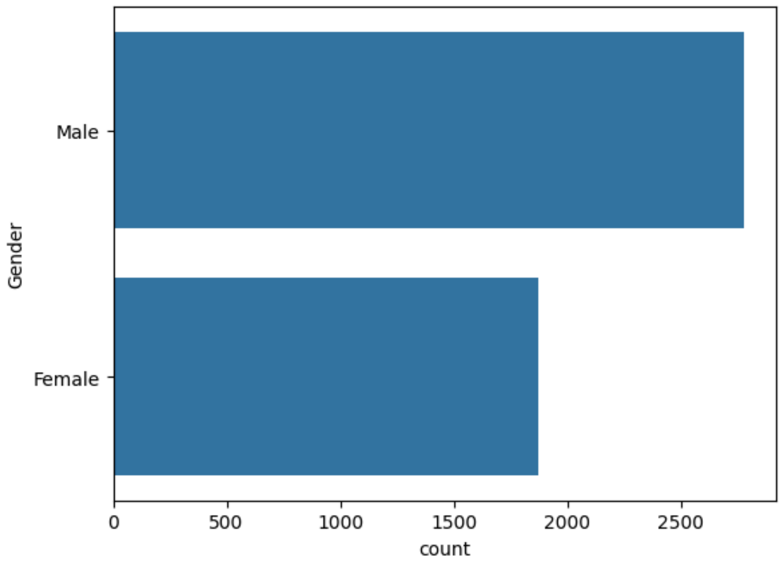
```
df["Gender"].value_counts()
```

```
         count
Gender
  Male    2778
Female    1875

dtype: int64
```

```
sns.countplot(df["Gender"])
```

```
<Axes: xlabel='count', ylabel='Gender'>
```

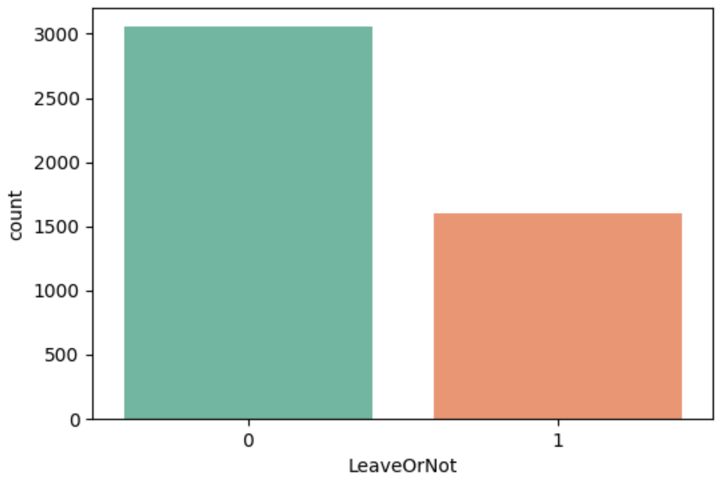


```
df["LeaveOrNot"].value_counts()
```

	count
LeaveOrNot	
0	3053
1	1600

dtype: int64

```
plt.figure(figsize=(6,4))
sns.countplot(x="LeaveOrNot", data=df, hue="LeaveOrNot", palette="Set2", legend=False)
plt.show()
```



```
df.head()
```

	Education	JoiningYear	City	PaymentTier	Age	Gender	EverBenched	ExperienceInCurrentDomain	LeaveOrNot
0	Bachelors	2017	Bangalore	3	34	Male	No	0	0
1	Bachelors	2013	Pune	1	28	Female	No	3	1
2	Bachelors	2014	New Delhi	3	38	Female	No	2	0
3	Masters	2016	Bangalore	3	27	Male	No	5	1
4	Masters	2017	Pune	3	24	Male	Yes	2	1

```
df = pd.get_dummies(df,["Education", "City", "Gender", "EverBenched"])
```

```
df.head()
```

	JoiningYear	PaymentTier	Age	ExperienceInCurrentDomain	LeaveOrNot	Education_Bachelors	Education_Masters	Ed
0	2017	3	34	0	0	True	False	
1	2013	1	28	3	1	True	False	
2	2014	3	38	2	0	True	False	
3	2016	3	27	5	1	False	True	
4	2017	3	24	2	1	False	True	

```
df.head()
```

	JoiningYear	PaymentTier	Age	ExperienceInCurrentDomain	LeaveOrNot	Education_Bachelors	Education_Masters	Ed
0	2017	3	34	0	0	True	False	
1	2013	1	28	3	1	True	False	
2	2014	3	38	2	0	True	False	
3	2016	3	27	5	1	False	True	
4	2017	3	24	2	1	False	True	

```
x = df.drop(["LeaveOrNot"], axis = 1)
y = df["LeaveOrNot"]
```

```
x.head()
```

	JoiningYear	PaymentTier	Age	ExperienceInCurrentDomain	Education_Bachelors	Education_Masters	Education_PHD
0	2017	3	34	0	True	False	False
1	2013	1	28	3	True	False	False
2	2014	3	38	2	True	False	False
3	2016	3	27	5	False	True	False
4	2017	3	24	2	False	True	False

```
y.head()
```

	LeaveOrNot
0	0
1	1
2	0
3	1
4	1

dtype: int64

```
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.2)
```

```
x_train.shape
```

```
(3722, 14)
```

```
x_test.shape
```

```
(931, 14)
```

```
                Logistic Regression
```

```
lr = LogisticRegression()
lr.fit(x_train, y_train)
```

```
▾ LogisticRegression
LogisticRegression()
```

```
y_pred = lr.predict(x_test)
accuracy_score(y_pred, y_test)
```

```
0.7346938775510204
```

SVM (Support Vector Machine)

```
svm = SVC()
svm.fit(x_train, y_train)
```

```
▾ SVC
SVC()
```

```
y_pred = svm.predict(x_test)
accuracy_score(y_pred, y_test)
```

```
0.6799140708915145
```

Random Forest

```
rf = RandomForestClassifier()
rf.fit(x_train, y_train)
```

```
▾ RandomForestClassifier
RandomForestClassifier()
```

```
y_pred = rf.predict(x_test)
accuracy_score(y_pred, y_test)
```

```
0.8421052631578947
```

```
xb = XGBClassifier()
xb.fit(x_train, y_train)
```

```
▾                              XGBClassifier
XGBClassifier(base_score=None, booster=None, callbacks=None,
              colsample_bylevel=None, colsample_bynode=None,
              colsample_bytree=None, device=None, early_stopping_rounds=None,
              enable_categorical=False, eval_metric=None, feature_types=None,
              feature_weights=None, gamma=None, grow_policy=None,
              importance_type=None, interaction_constraints=None,
              learning_rate=None, max_bin=None, max_cat_threshold=None,
              max_cat_to_onehot=None, max_delta_step=None, max_depth=None,
              max_leaves=None, min_child_weight=None, missing=nan,
              monotone_constraints=None, multi_strategy=None, n_estimators=None,
              n_jobs=None, num_parallel_tree=None, ...)
```

```
y_pred = xb.predict(x_test)
accuracy_score(y_pred, y_test)
```

```
0.8571428571428571
```