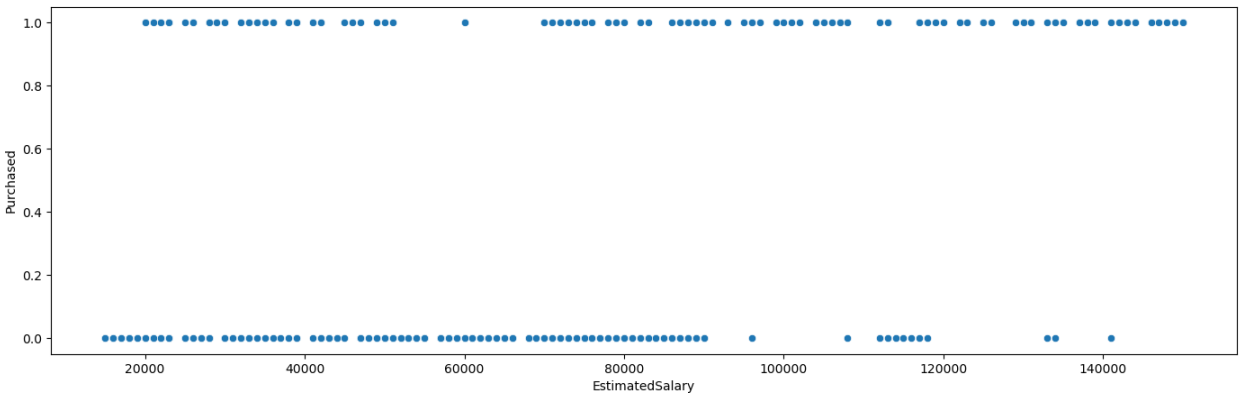
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df=pd.read_csv("Social_Network_Ads.csv")

df.head()
```

	User ID	Gender	Age	EstimatedSalary	Purchased
0	15624510	Male	19	19000	0
1	15810944	Male	35	20000	0
2	15668575	Female	26	43000	0
3	15603246	Female	27	57000	0
4	15804002	Male	19	76000	0

```
df.tail()
```

	User ID	Gender	Age	EstimatedSalary	Purchased
395	15691863	Female	46	41000	1
396	15706071	Male	51	23000	1
397	15654296	Female	50	20000	1
398	15755018	Male	36	33000	0
399	15594041	Female	49	36000	1

```
plt.figure(figsize=(17,5))
sns.scatterplot(data=df,x=df.EstimatedSalary,y=df.Purchased)
plt.show()
```




```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 400 entries, 0 to 399
Data columns (total 5 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   User ID          400 non-null    int64
 1   Gender           400 non-null    object
```

```
 2   Age              400 non-null    int64
 3   EstimatedSalary  400 non-null    int64
 4   Purchased        400 non-null    int64
dtypes: int64(4), object(1)
memory usage: 15.8+ KB
```

```
df.describe()
```

	User ID	Age	EstimatedSalary	Purchased
count	4.000000e+02	400.000000	400.000000	400.000000
mean	1.569154e+07	37.655000	69742.500000	0.357500
std	7.165832e+04	10.482877	34096.960282	0.479864
min	1.556669e+07	18.000000	15000.000000	0.000000
25%	1.562676e+07	29.750000	43000.000000	0.000000
50%	1.569434e+07	37.000000	70000.000000	0.000000
75%	1.575036e+07	46.000000	88000.000000	1.000000
max	1.581524e+07	60.000000	150000.000000	1.000000

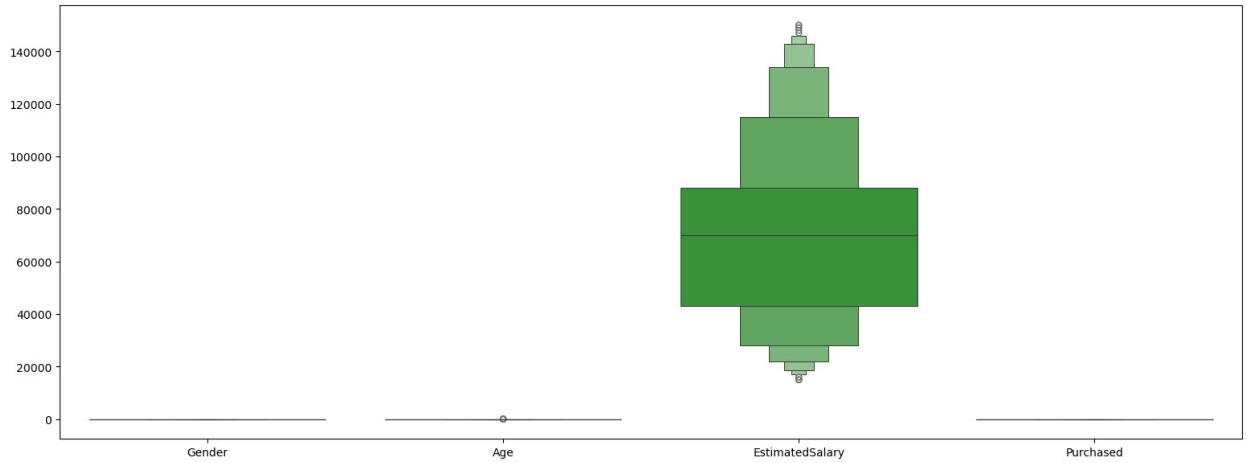
```
df.drop(columns=['User ID'],inplace=True)
```

```
print(df.columns)
```

```
Index(['Gender', 'Age', 'EstimatedSalary', 'Purchased'],
dtype='object')
```

```
plt.figure(figsize=(19,7))
sns.boxenplot(df)
```

```
<Axes: >
```

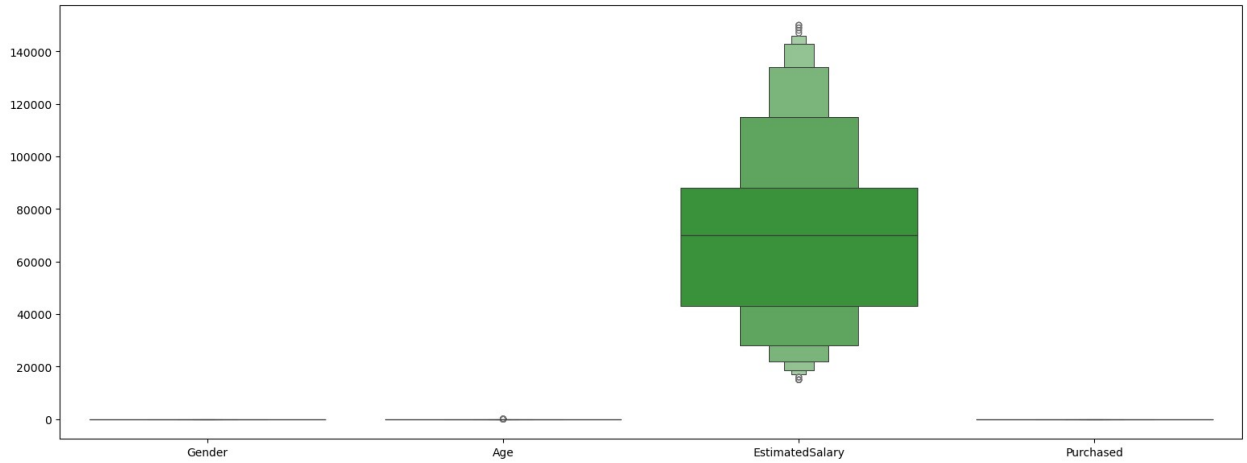



```
q1=df.quantile(0.25)
q3=df.quantile(0.75)
iqr=q3-q1
iqr
```

```
Gender                  1.00
Age                    16.25
EstimatedSalary     45000.00
Purchased               1.00
dtype: float64
```

```
ul=q3+1.5*iqr
ll=q1-1.5*iqr

df=df[-((df>ul)|(df<ll)).any(axis=1)]

plt.figure(figsize=(19,7))
sns.boxenplot(df)
```

```
<Axes: >
```




```
from sklearn.preprocessing import LabelEncoder

df['Gender']=LabelEncoder().fit_transform(df['Gender'])

df.head()
```

	Gender	Age	EstimatedSalary	Purchased
0	1	19	19000	0
1	1	35	20000	0
2	0	26	43000	0
3	0	27	57000	0
4	1	19	76000	0

```
x=df.drop(columns=['Purchased'])
y=df['Purchased']

from sklearn.model_selection import train_test_split

xtrain,xtest,ytrain,ytest=train_test_split(x,y,test_size=0.3,random_st
ate=42)
```

```
from sklearn.linear_model import LogisticRegression
model=LogisticRegression(solver='lbfgs',class_weight='balanced')

model.fit(xtrain,ytrain)

LogisticRegression(class_weight='balanced')

ypred=model.predict(xtest)

from sklearn import metrics

cm=metrics.confusion_matrix(ytest,ypred)

cm

array([[66,  7],
       [ 7, 40]], dtype=int64)

acc=metrics.accuracy_score(ypred,ytest)

acc

0.8833333333333333

sns.heatmap(data=cm,annot=True)

<Axes: >
```