In [2]:
```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

import warnings
warnings.filterwarnings('ignore')

%matplotlib inline
```

In [3]:
```
df = pd.read_csv('heart.csv')
df.head()
```

Out[3]:

	Age	Sex	ChestPainType	RestingBP	Cholesterol	FastingBS	RestingECG	MaxHR	ExerciseAngina	Oldpeak	ST_Slope	HeartDisease
0	40	M	ATA	140	289	0	Normal	172	N	0.0	Up	0
1	49	F	NAP	160	180	0	Normal	156	N	1.0	Flat	1
2	37	M	ATA	130	283	0	ST	98	N	0.0	Up	0
3	48	F	ASY	138	214	0	Normal	108	Y	1.5	Flat	1
4	54	M	NAP	150	195	0	Normal	122	N	0.0	Up	0

In [3]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 918 entries, 0 to 917
Data columns (total 12 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   Age             918 non-null    int64  
 1   Sex             918 non-null    object 
 2   ChestPainType   918 non-null    object 
 3   RestingBP       918 non-null    int64  
 4   Cholesterol     918 non-null    int64  
 5   FastingBS       918 non-null    int64  
 6   RestingECG      918 non-null    object 
 7   MaxHR           918 non-null    int64  
 8   ExerciseAngina  918 non-null    object 
 9   Oldpeak         918 non-null    float64
 10  ST_Slope        918 non-null    object 
 11  HeartDisease    918 non-null    int64  
dtypes: float64(1), int64(6), object(5)
memory usage: 86.2+ KB
```

In [4]:
```
df.describe().T
```

Out[4]:

	count	mean	std	min	25%	50%	75%	max
Age	918.0	53.510893	9.432617	28.0	47.00	54.0	60.0	77.0
RestingBP	918.0	132.396514	18.514154	0.0	120.00	130.0	140.0	200.0
Cholesterol	918.0	198.799564	109.384145	0.0	173.25	223.0	267.0	603.0
FastingBS	918.0	0.233115	0.423046	0.0	0.00	0.0	0.0	1.0
MaxHR	918.0	136.809368	25.460334	60.0	120.00	138.0	156.0	202.0
Oldpeak	918.0	0.887364	1.066570	-2.6	0.00	0.6	1.5	6.2
HeartDisease	918.0	0.553377	0.497414	0.0	0.00	1.0	1.0	1.0

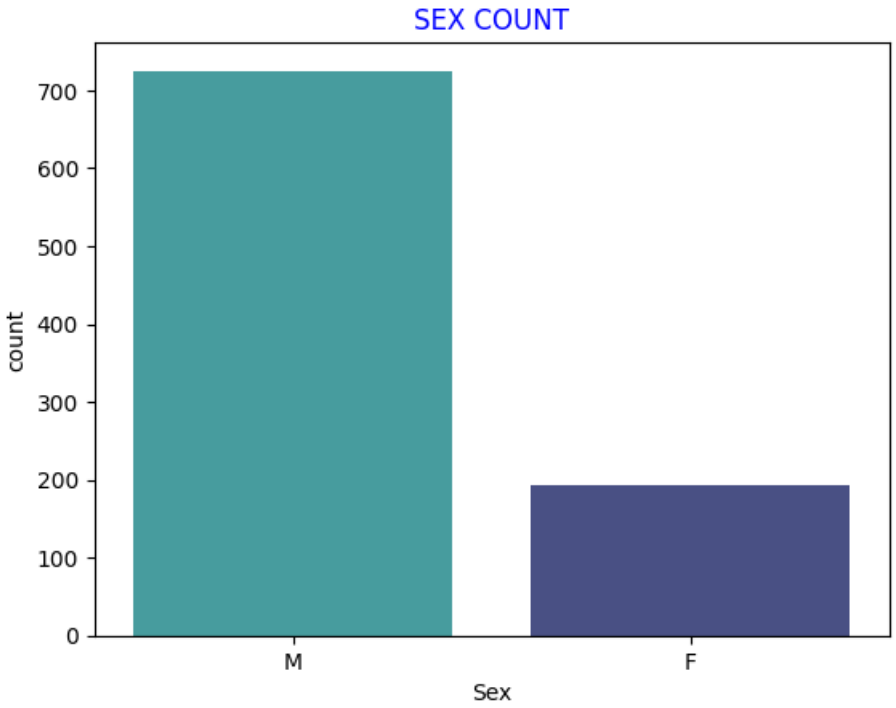
Count plot

seaborn.countplot() method is used to Show the counts of observations in each categorical bin using bars.

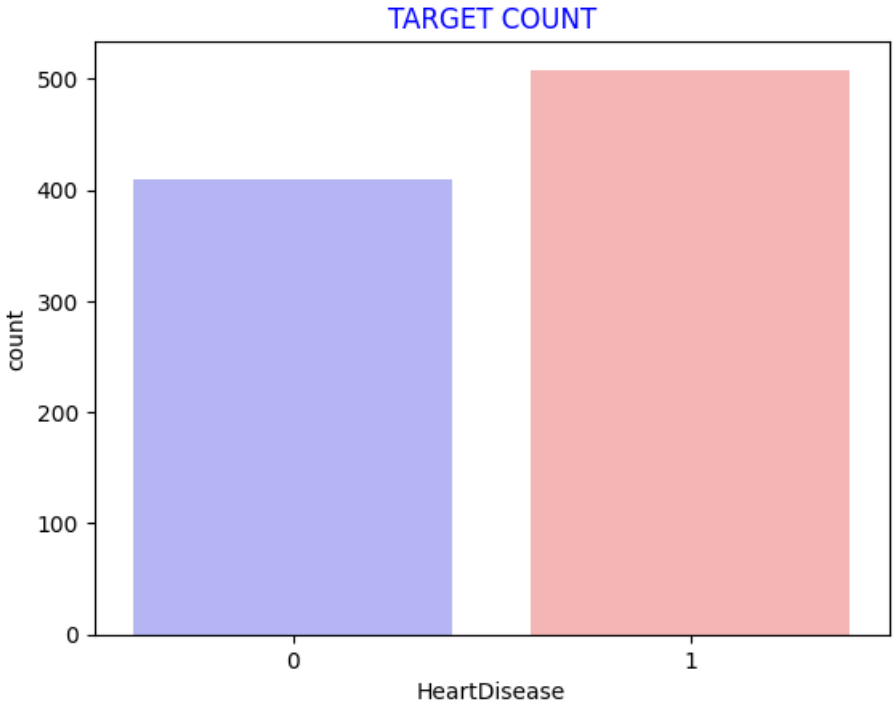
In [5]:
```
df.Sex.value_counts()
```

Out[5]:
```
M    725
F    193
Name: Sex, dtype: int64
```

In [6]:
```
sns.countplot(x="Sex", data=df, palette="mako_r")
plt.title("SEX COUNT", size=12, c='b')
plt.show()
```



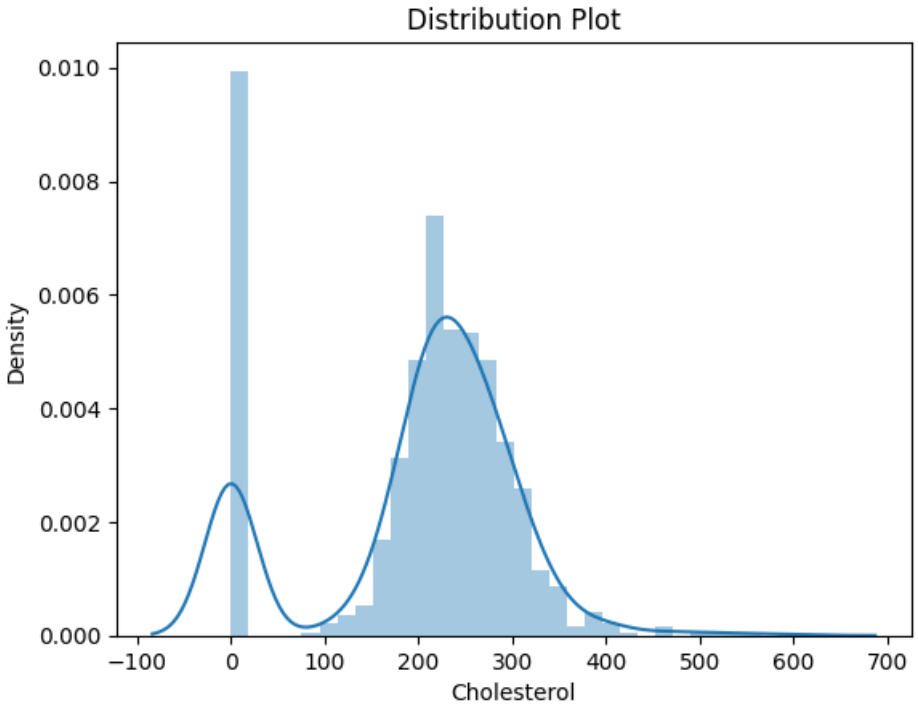
In [7]:
```
sns.countplot(x="HeartDisease", data=df, palette="bwr")
plt.title("TARGET COUNT", size=12, c='b')
plt.show()
```



Distplot

The seaborn.distplot() represents the univariate distribution of data i.e. data distribution of a variable against the density distribution.

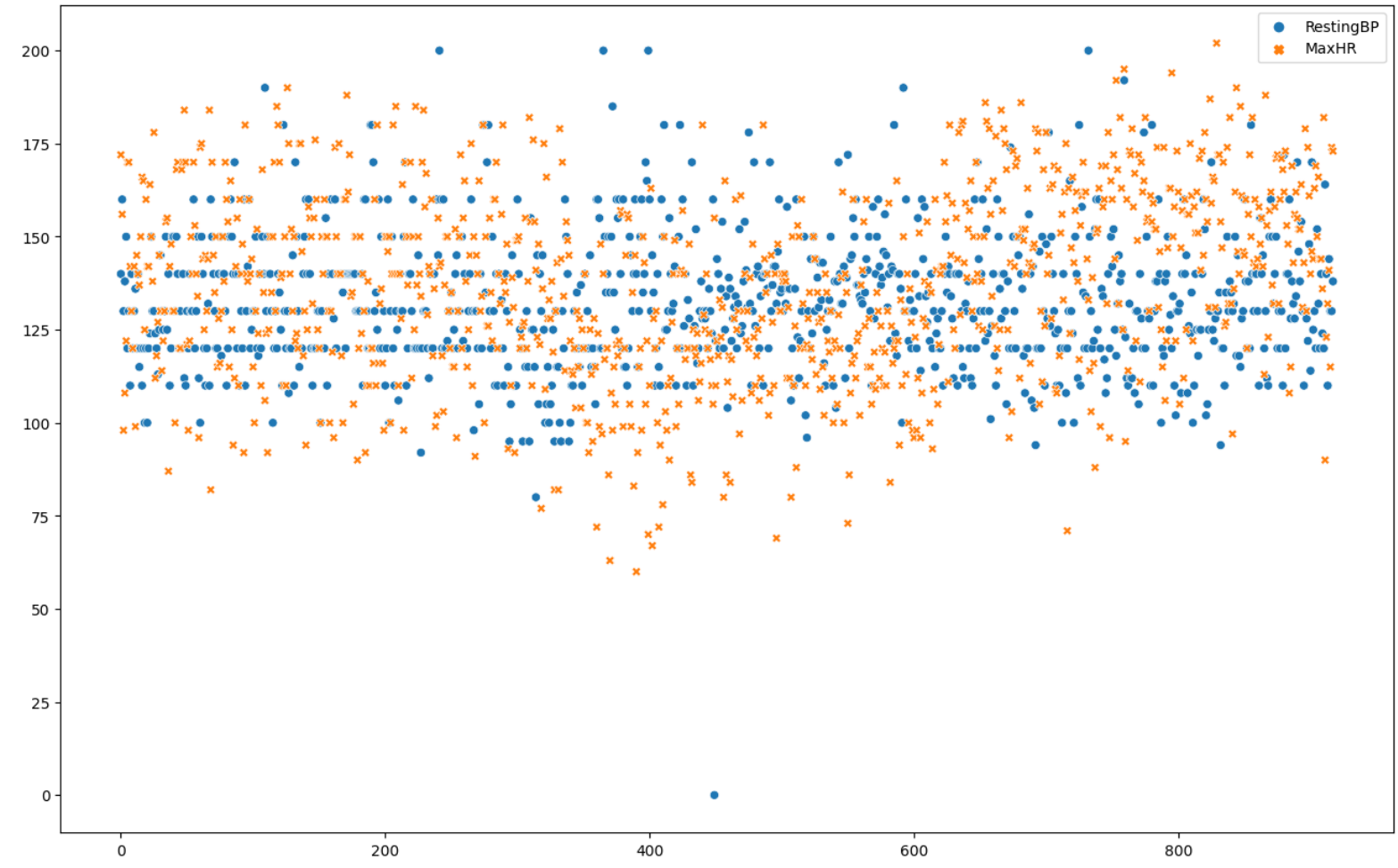
In [8]:
```
plt.title("Distribution Plot")
sns.distplot(df["Cholesterol"])
plt.show()
```



Scatter Plot

A scatterplot is a type of data display that shows the relationship between two numerical variables.

In [9]:
```
plt.figure(figsize=(16, 10))
sns.scatterplot([df.RestingBP, df.MaxHR])
plt.show()
```

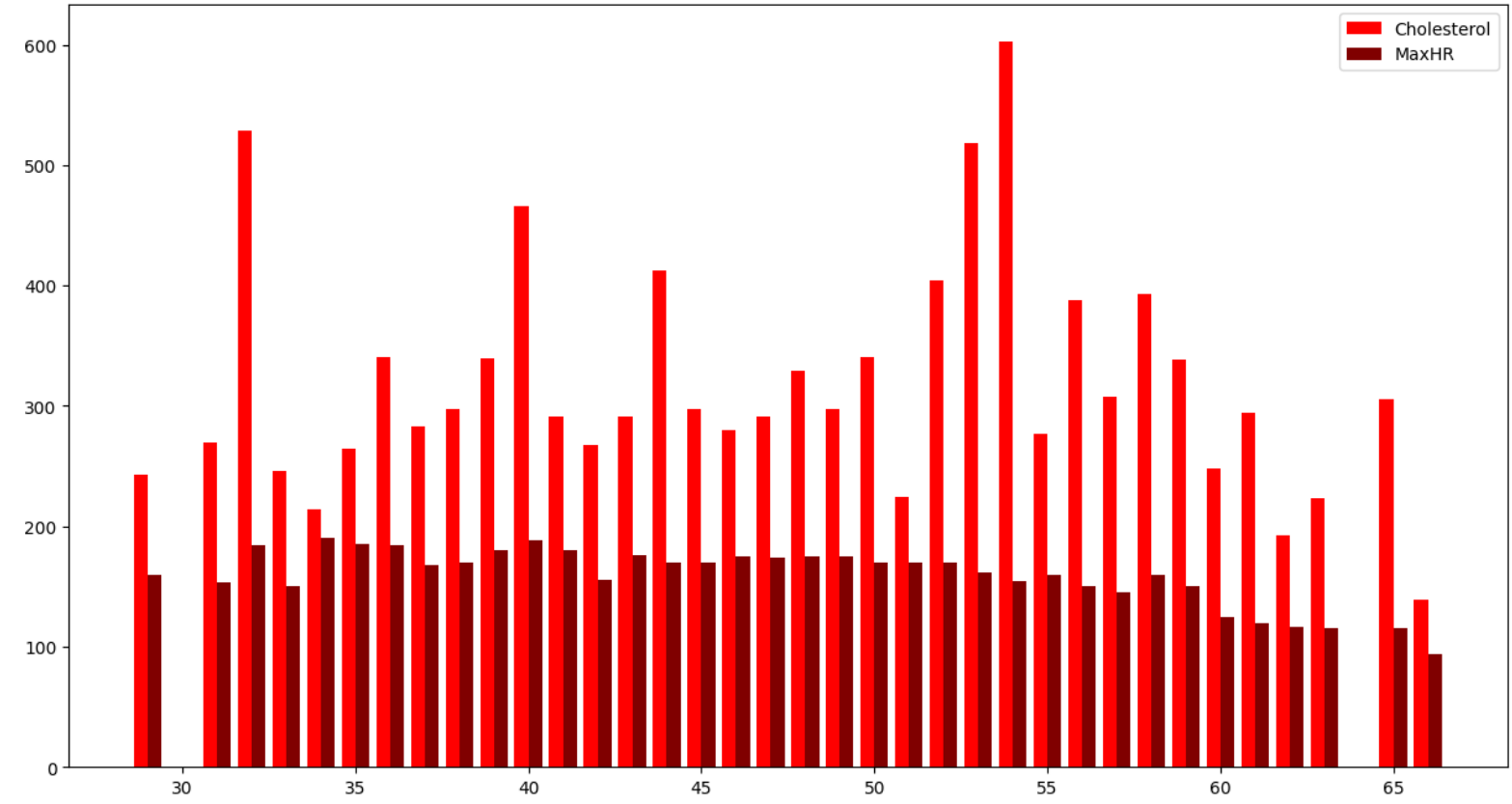


Grouped BarPlot

A bar plot or bar chart is a graph that represents the category of data with rectangular bars with lengths and heights that is proportional to the values which they represent.

In [10]:
```
plt.figure(figsize=(15,8))
```

```
width=0.4
plt.bar(df.Age[:200]-0.2, df.Cholesterol[:200], width, color="red")
plt.bar(df.Age[:200]+0.2, df.MaxHR[:200], width, color="maroon")
plt.legend(['Cholesterol', 'MaxHR'])
plt.show()
```

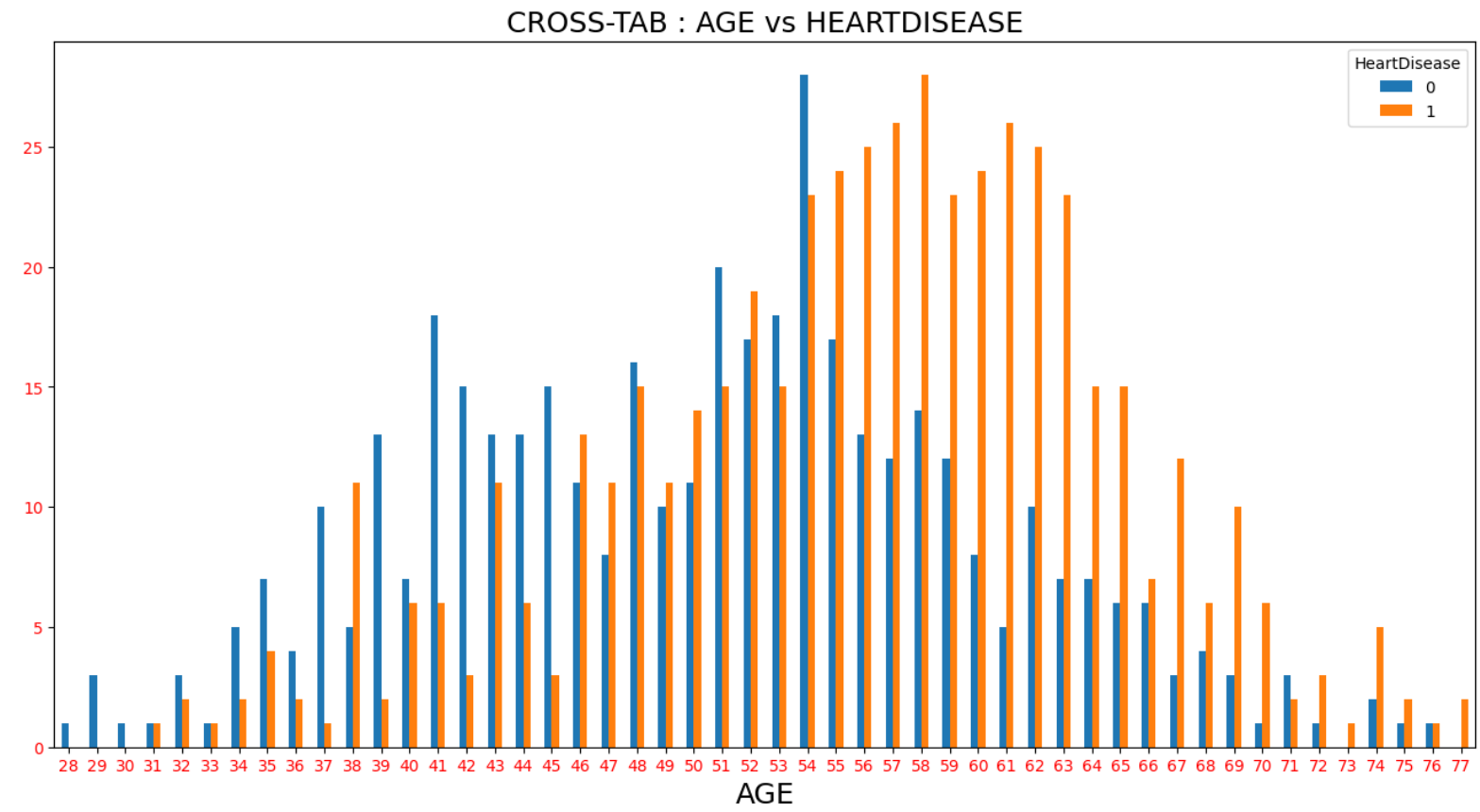


pandas.crosstab()

Same as pivot_table()

Crosstabs are used for categorical data, while pivot tables can be used for both categorical and numerical data. Crosstabs are used to analyze the relationship between two categorical variables, while pivot tables can analyze the relationships between multiple variables, both categorical and numerical.

In [11]:
```
pd.crosstab(df.Age, df.HeartDisease).plot(kind="bar", figsize=(16,8))
plt.xticks(rotation="horizontal", c='r')
plt.yticks(c='r')
plt.title("CROSS-TAB : AGE vs HEARTDISEASE", size=18)
plt.xlabel("AGE", size="18")
plt.show()
```

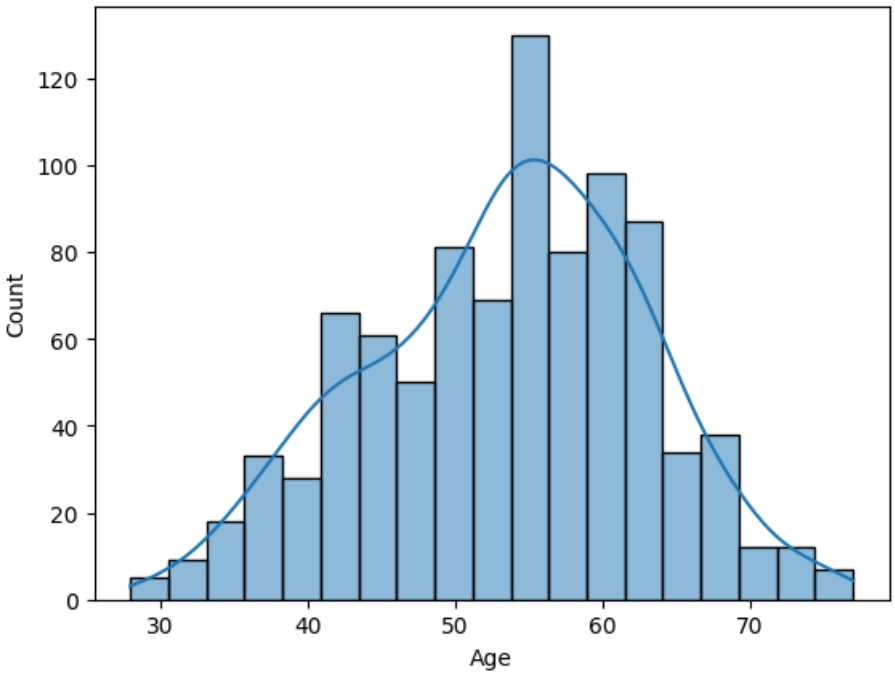


Histogram

A histogram is a representation of the distribution of data.

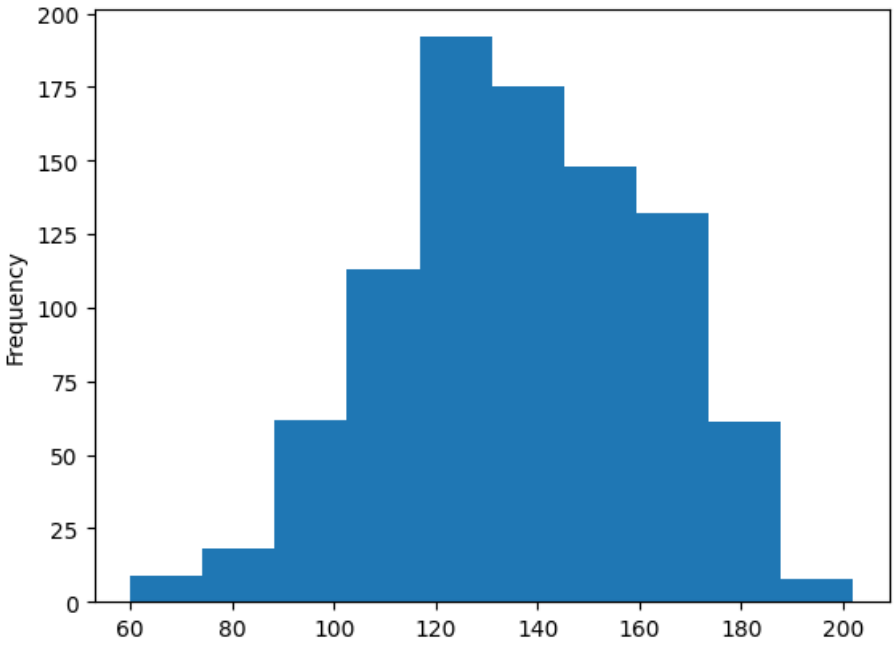
In [12]:
```
sns.histplot(df['Age'], kde=True)
```

Out[12]:<Axes: xlabel='Age', ylabel='Count'>



In [13]:
```
df.MaxHR.plot(kind="hist")
```

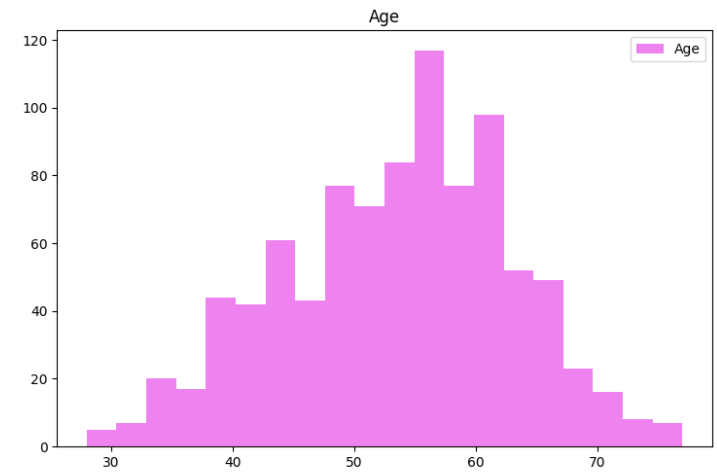
Out[13]:<Axes: ylabel='Frequency'>

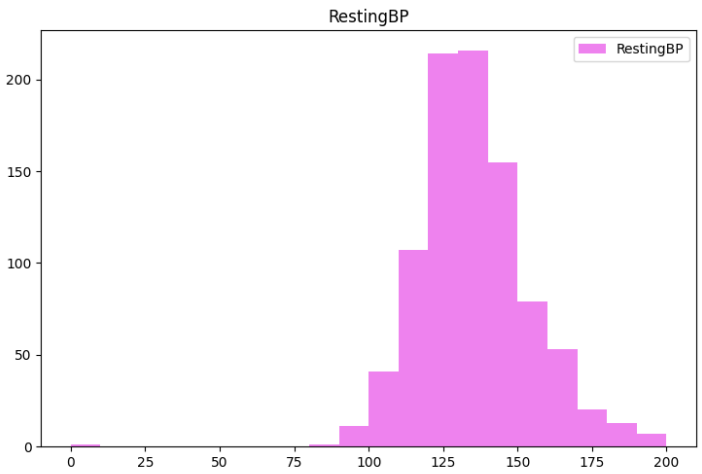


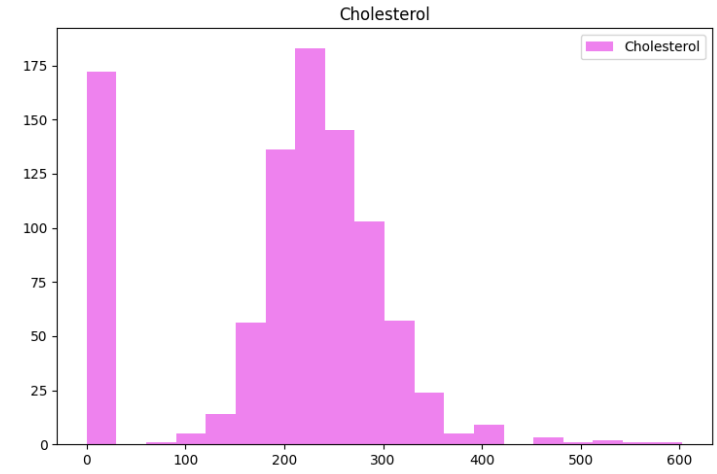
In [14]:
```
hist_lis = ['Age', 'RestingBP', 'Cholesterol', 'FastingBS', 'MaxHR', 'Oldpeak']
hist_lis
```

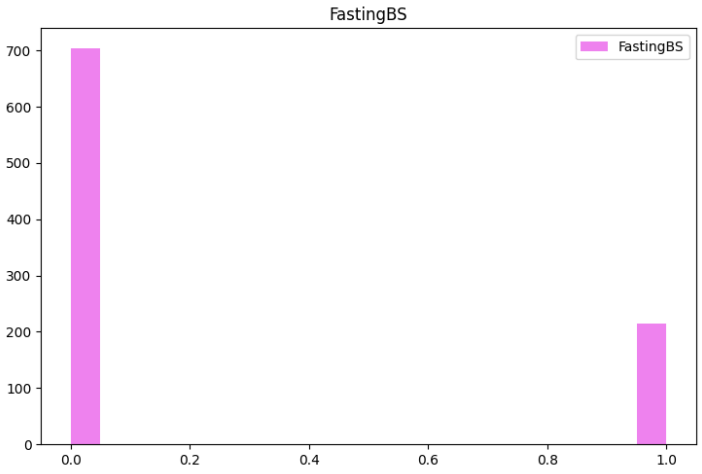
Out[14]:['Age', 'RestingBP', 'Cholesterol', 'FastingBS', 'MaxHR', 'Oldpeak']

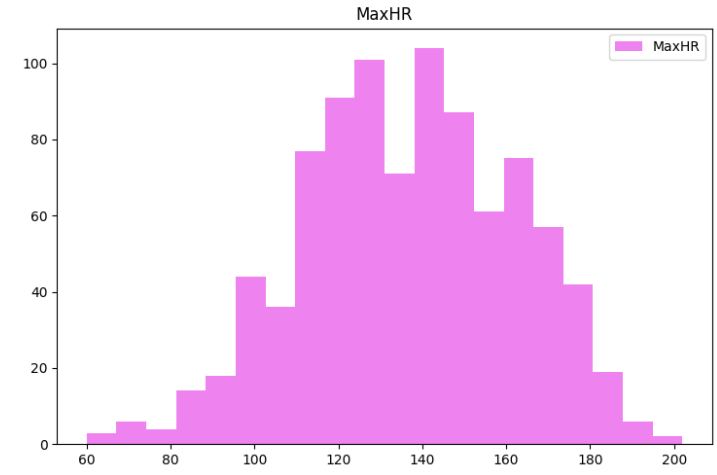
In [15]:
```
df.hist(hist_lis,
        figsize=(20,20),
        grid=False,
        bins=20,
        color="violet",
        legend=True)
plt.show()
```

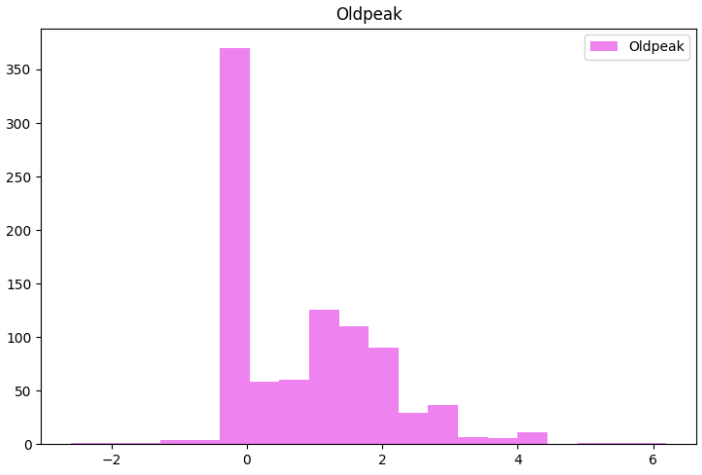








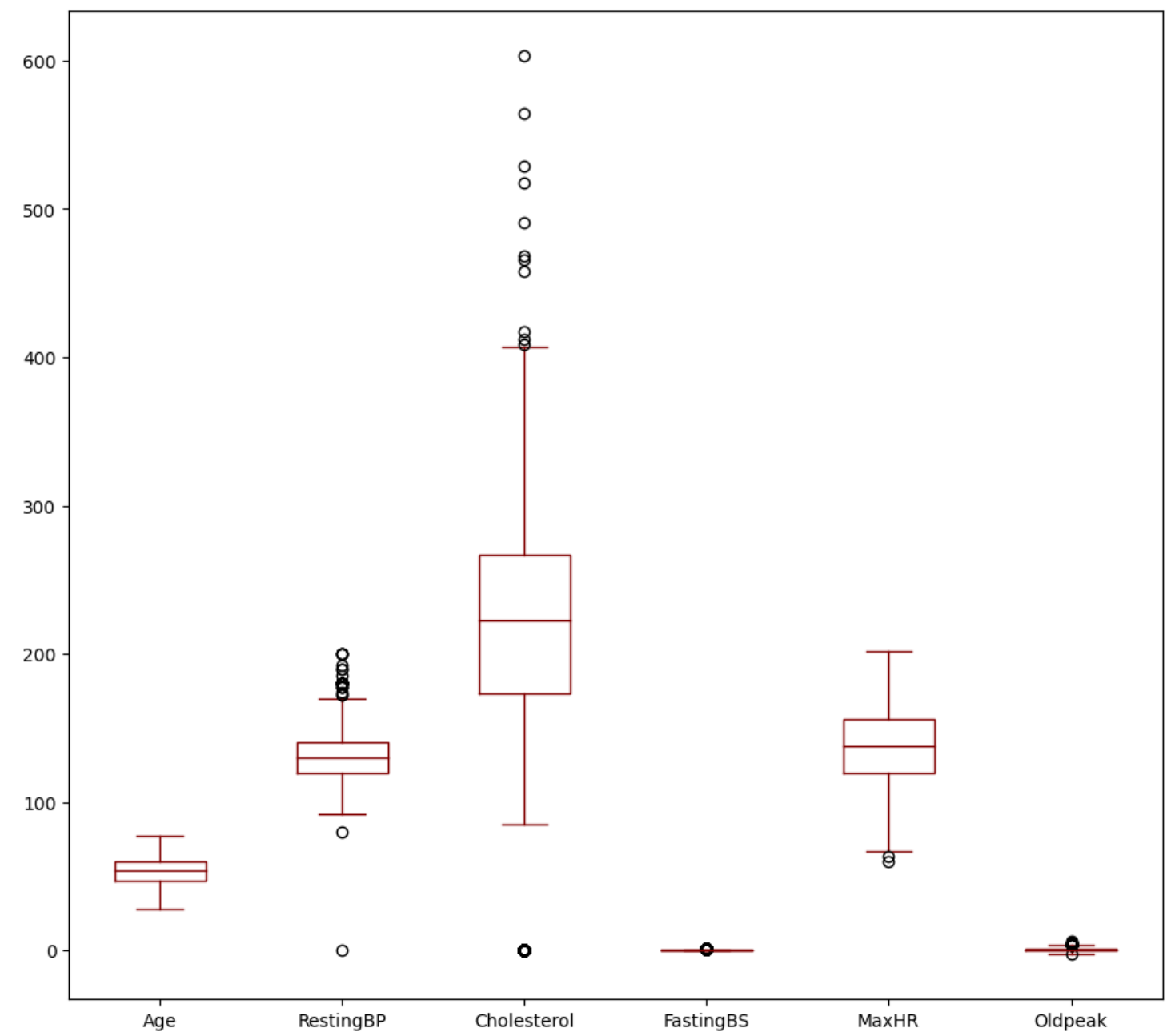




Boxplot

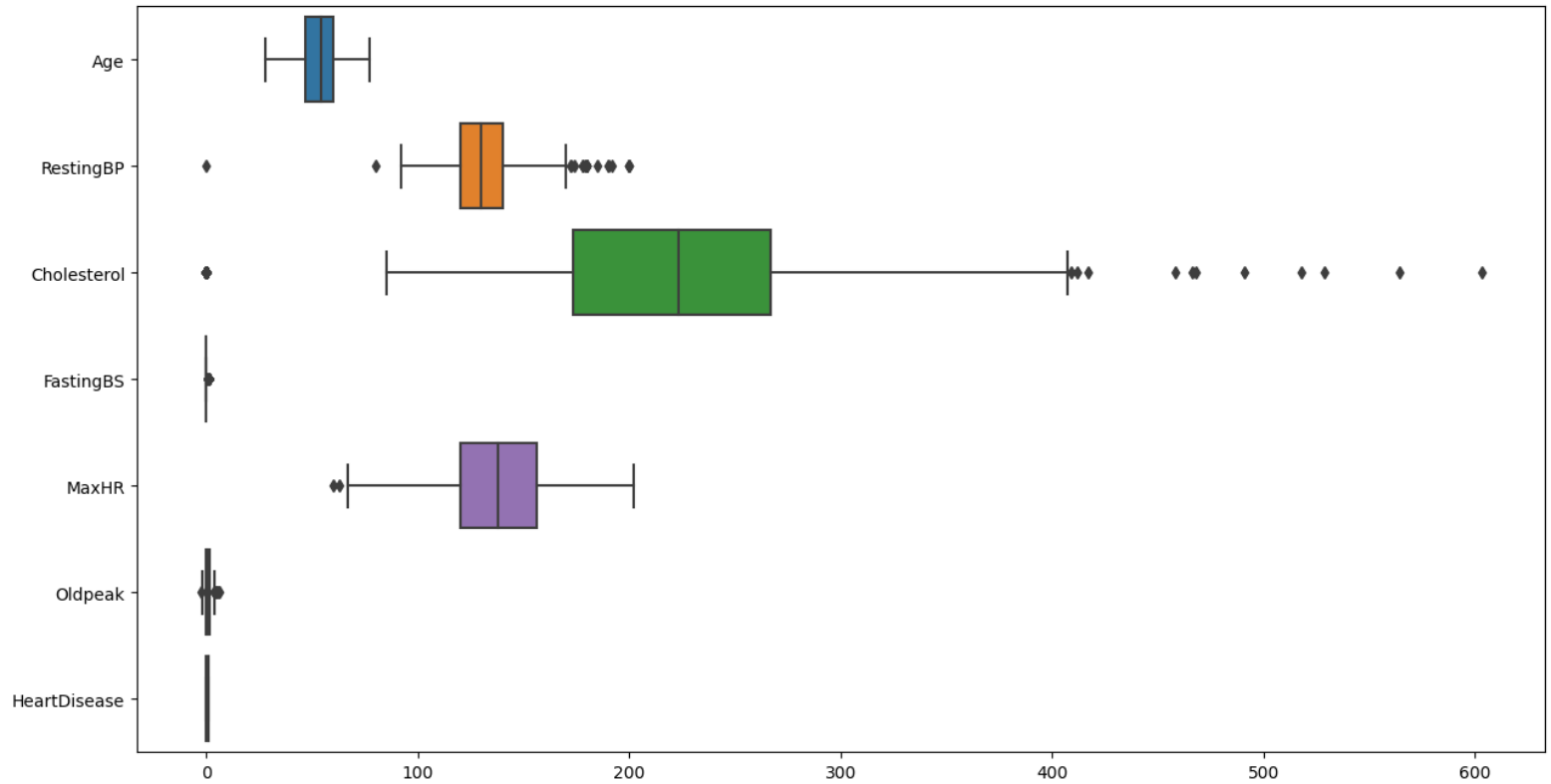
A boxplot is a standardized way of displaying the distribution of data based on a five number summary (“minimum”, first quartile [Q1], median, third quartile [Q3] and “maximum”). It can tell you about your outliers and what their values are.

In [34]:
```
df.boxplot(hist_lis,
        figsize=(11,10),
        color="maroon",
        grid=False)
plt.show()
```



In [43]:
```
plt.figure(figsize=(15,8))
sns.boxplot(df, orient='h')
```

Out[43]:<Axes: >



In [4]:
```
dp = df.HeartDisease
ns = dp.groupby(pd.cut(df['RestingBP'],[100,120,140,160])).count()
plt.pie(ns,labels=['low','mid','hight'])
```

Out[4]:
```
([<matplotlib.patches.Wedge at 0x7f1b9623a020>,
  <matplotlib.patches.Wedge at 0x7f1b96239f30>,
  <matplotlib.patches.Wedge at 0x7f1b9623a8f0>],
 [Text(0.6100667146441068, 0.9153243161215296, 'low'),
  Text(-1.0419233031728248, -0.35269793067925703, 'mid'),
  Text(0.8713415624311371, -0.6713895155422559, 'hight')])
```