In [1]:
```
# import library
```

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [2]:
```
heart=pd.read_csv('heart_disease.csv')
heart
```

Out[2]:

	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalen
0	Male	39	postgraduate	0	0.0	0.0	no	
1	Female	46	primaryschool	0	0.0	0.0	no	
2	Male	48	uneducated	1	20.0	0.0	no	
3	Female	61	graduate	1	30.0	0.0	no	
4	Female	46	graduate	1	23.0	0.0	no	
...	...	...	...	...	...	...	...	
4233	Male	50	uneducated	1	1.0	0.0	no	
4234	Male	51	graduate	1	43.0	0.0	no	
4235	Female	48	primaryschool	1	20.0	NaN	no	
4236	Female	44	uneducated	1	15.0	0.0	no	
4237	Female	52	primaryschool	0	0.0	0.0	no	

4238 rows × 16 columns

In [3]:
```
#analysis the data set
```

In [4]:
```
heart.shape
```

Out[4]:
```
(4238, 16)
```

In [5]:
```
heart.dropna()
```

Out[5]:

	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalen
0	Male	39	postgraduate	0	0.0	0.0	no	
1	Female	46	primaryschool	0	0.0	0.0	no	
2	Male	48	uneducated	1	20.0	0.0	no	
3	Female	61	graduate	1	30.0	0.0	no	
4	Female	46	graduate	1	23.0	0.0	no	
...	...	...	...	...	...	...	...	
4231	Male	58	graduate	0	0.0	0.0	no	
4232	Male	68	uneducated	0	0.0	0.0	no	
4233	Male	50	uneducated	1	1.0	0.0	no	
4234	Male	51	graduate	1	43.0	0.0	no	
4237	Female	52	primaryschool	0	0.0	0.0	no	

3656 rows × 16 columns

In [6]:
```
heart.dropna(inplace=True)
```

In [7]:
```
heart
```

Out[7]:

	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalen
0	Male	39	postgraduate	0	0.0	0.0	no	
1	Female	46	primaryschool	0	0.0	0.0	no	
2	Male	48	uneducated	1	20.0	0.0	no	
3	Female	61	graduate	1	30.0	0.0	no	
4	Female	46	graduate	1	23.0	0.0	no	
...	...	...	...	...	...	...	...	
4231	Male	58	graduate	0	0.0	0.0	no	
4232	Male	68	uneducated	0	0.0	0.0	no	
4233	Male	50	uneducated	1	1.0	0.0	no	
4234	Male	51	graduate	1	43.0	0.0	no	
4237	Female	52	primaryschool	0	0.0	0.0	no	

3656 rows × 16 columns

In [8]:
```
heart.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 3656 entries, 0 to 4237
Data columns (total 16 columns):
 #   Column           Non-Null Count  Dtype  
---  ------           --------------  -----  
 0   Gender           3656 non-null   object 
 1   age              3656 non-null   int64  
 2   education        3656 non-null   object 
 3   currentSmoker    3656 non-null   int64  
 4   cigsPerDay       3656 non-null   float64
 5   BPMeds           3656 non-null   float64
 6   prevalentStroke  3656 non-null   object 
 7   prevalentHyp     3656 non-null   int64  
 8   diabetes         3656 non-null   int64  
 9   totChol          3656 non-null   float64
 10  sysBP            3656 non-null   float64
 11  diaBP            3656 non-null   float64
 12  BMI              3656 non-null   float64
 13  heartRate        3656 non-null   float64
 14  glucose          3656 non-null   float64
 15  Heart_ stroke    3656 non-null   object 
dtypes: float64(8), int64(4), object(4)
memory usage: 485.6+ KB
```

In [9]:
```
# delete the data set
```

In [10]:
```
heart.drop('prevalentStroke',axis=1)
```

Out[10]:

	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentHyp	diabetes	t
0	Male	39	postgraduate	0	0.0	0.0	0	0	
1	Female	46	primaryschool	0	0.0	0.0	0	0	
2	Male	48	uneducated	1	20.0	0.0	0	0	
3	Female	61	graduate	1	30.0	0.0	1	0	
4	Female	46	graduate	1	23.0	0.0	0	0	
...	...	...	...	...	...	...	...	...	
4231	Male	58	graduate	0	0.0	0.0	1	0	
4232	Male	68	uneducated	0	0.0	0.0	1	0	
4233	Male	50	uneducated	1	1.0	0.0	1	0	
4234	Male	51	graduate	1	43.0	0.0	0	0	
4237	Female	52	primaryschool	0	0.0	0.0	0	0	

3656 rows × 15 columns

In [11]:
```
heart.drop('Heart_ stroke',axis=1)
```

Out[11]:

	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalen
0	Male	39	postgraduate	0	0.0	0.0	no	
1	Female	46	primaryschool	0	0.0	0.0	no	
2	Male	48	uneducated	1	20.0	0.0	no	
3	Female	61	graduate	1	30.0	0.0	no	
4	Female	46	graduate	1	23.0	0.0	no	
...	...	...	...	...	...	...	...	
4231	Male	58	graduate	0	0.0	0.0	no	
4232	Male	68	uneducated	0	0.0	0.0	no	
4233	Male	50	uneducated	1	1.0	0.0	no	
4234	Male	51	graduate	1	43.0	0.0	no	
4237	Female	52	primaryschool	0	0.0	0.0	no	

3656 rows × 15 columns

In [12]:
```
heart.drop('prevalentStroke',axis=1,inplace=True)
```

In [13]:
```
pd.crosstab(heart['sysBP'],heart['diaBP'])
```

Out[13]:

diaBP	48.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	57.5	58.0	...	125.0	127.5	128.0	130.0	1
sysBP																
83.5	0	0	0	0	0	1	0	0	0	1	...	0	0	0	0	
85.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	
85.5	0	1	0	0	0	0	0	0	0	0	...	0	0	0	0	
90.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	
92.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
232.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	
243.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	
244.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	
248.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	1	
295.0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	

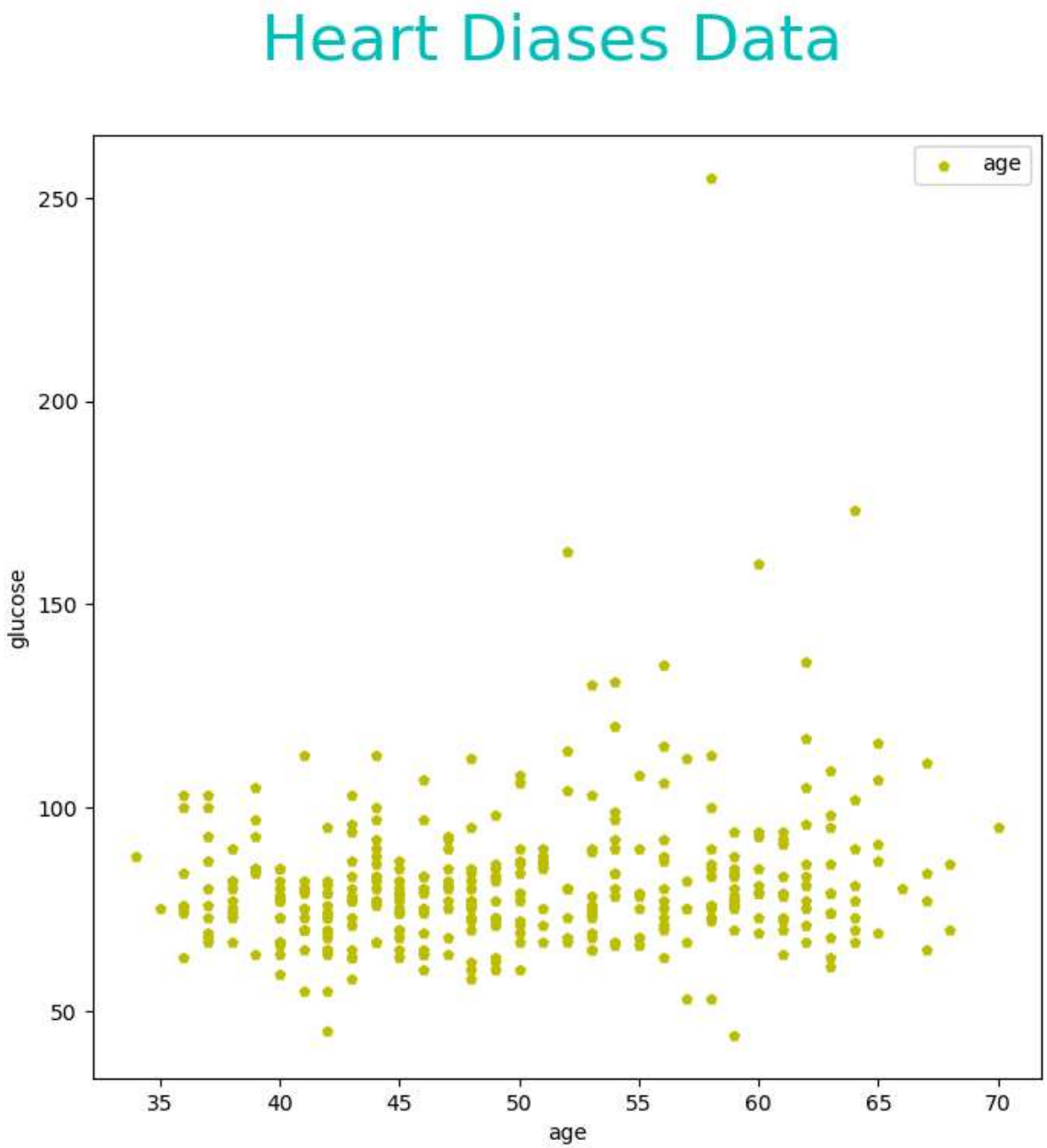
231 rows × 142 columns

In [14]:
```
heart.drop('Heart_ stroke',axis=1,inplace=True)
```

In [15]:
```
heart.shape
```

Out[15]:
```
(3656, 14)
```

In [16]:
```
heart.sample(frac=0.1).plot(x='age',
                            y='glucose',
                            kind="scatter",
                            color='y',
                            marker='p',
                            figsize=(8,8),
                            label='age');
plt.xlabel='Age'
plt.ylabel='Glocose'
plt.legend()
#heart.legend(*plt.legend_elements(),title='Data')
plt.style.use('ggplot')
plt.suptitle('Heart Diases Data',fontsize='30',fontweight='30',color='c');
```



In [17]:
```
# plotting the mean value of the data
```

In [18]:
```
heart.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 3656 entries, 0 to 4237
Data columns (total 14 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   Gender          3656 non-null   object 
 1   age             3656 non-null   int64  
 2   education       3656 non-null   object 
 3   currentSmoker   3656 non-null   int64  
 4   cigsPerDay      3656 non-null   float64
 5   BPMeds          3656 non-null   float64
 6   prevalentHyp    3656 non-null   int64  
 7   diabetes        3656 non-null   int64  
 8   totChol         3656 non-null   float64
 9   sysBP           3656 non-null   float64
 10  diaBP           3656 non-null   float64
 11  BMI             3656 non-null   float64
 12  heartRate       3656 non-null   float64
 13  glucose         3656 non-null   float64
dtypes: float64(8), int64(4), object(2)
memory usage: 428.4+ KB
```

In [19]:
```
heart['glucose']=heart['glucose'].astype(int)
```

In [20]:
```
heart.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 3656 entries, 0 to 4237
Data columns (total 14 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   Gender          3656 non-null   object 
 1   age             3656 non-null   int64  
 2   education       3656 non-null   object 
 3   currentSmoker   3656 non-null   int64  
 4   cigsPerDay      3656 non-null   float64
 5   BPMeds          3656 non-null   float64
 6   prevalentHyp    3656 non-null   int64  
 7   diabetes        3656 non-null   int64  
 8   totChol         3656 non-null   float64
 9   sysBP           3656 non-null   float64
 10  diaBP           3656 non-null   float64
 11  BMI             3656 non-null   float64
 12  heartRate       3656 non-null   float64
 13  glucose         3656 non-null   int32  
dtypes: float64(7), int32(1), int64(4), object(2)
memory usage: 414.2+ KB
```

In [21]:
```
heart['glucose'].mode()
```

Out[21]:
```
0    75
Name: glucose, dtype: int32
```

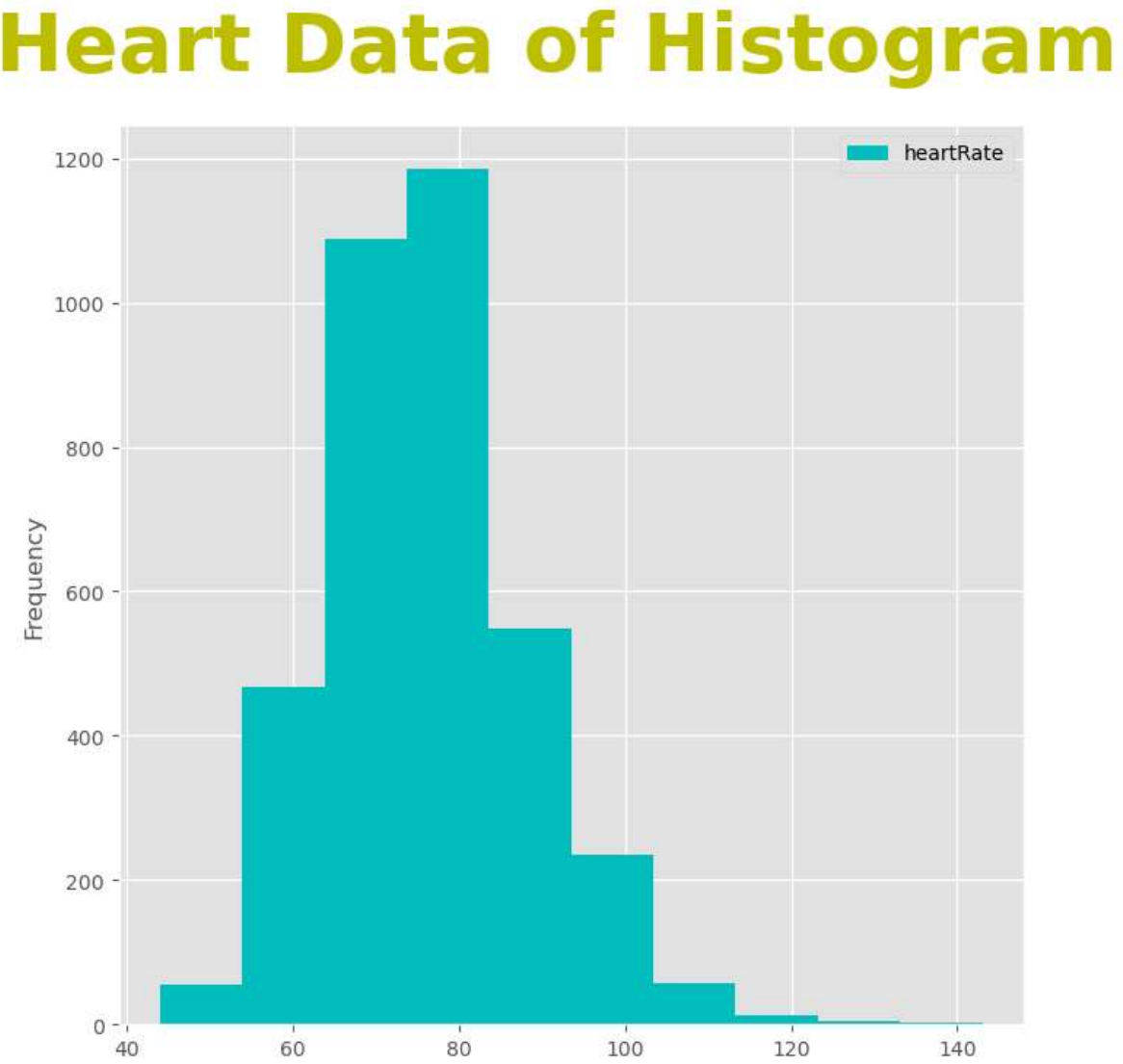
In [22]:
```
# plotting
```

In [23]:
```
heart.head()
```

Out[23]:

	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentHyp	diabetes	totC
0	Male	39	postgraduate	0	0.0	0.0	0	0	19
1	Female	46	primaryschool	0	0.0	0.0	0	0	25
2	Male	48	uneducated	1	20.0	0.0	0	0	24
3	Female	61	graduate	1	30.0	0.0	1	0	22
4	Female	46	graduate	1	23.0	0.0	0	0	28

In [24]:
```
heart.plot(x='age',
           y='heartRate',
           kind='hist',
           color='c',
           figsize=(8,8));

plt.suptitle('Heart Data of Histogram',
             fontsize='40',
              fontweight='bold',
              color='y');
```



In [25]:
```
#plotting the Data set in fig
```

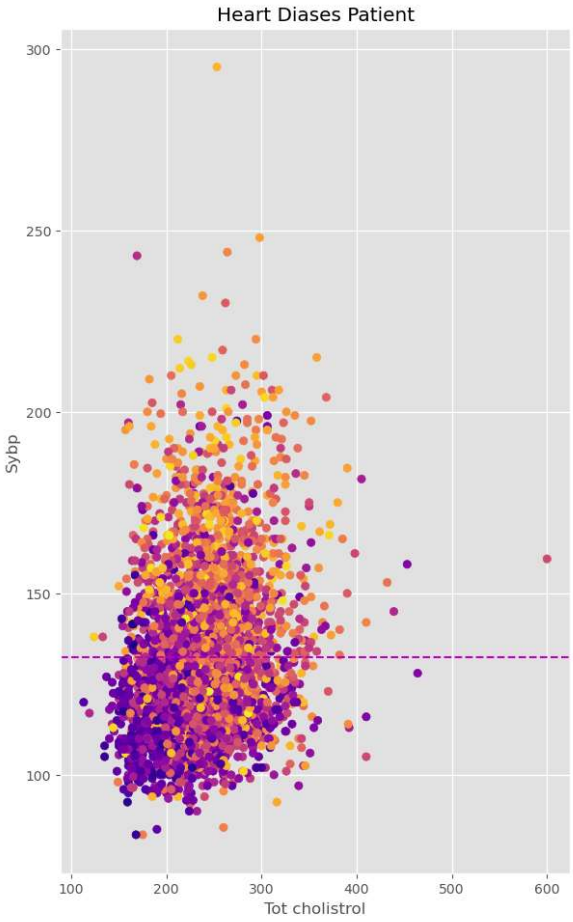
In [26]:
```
#fig data
```

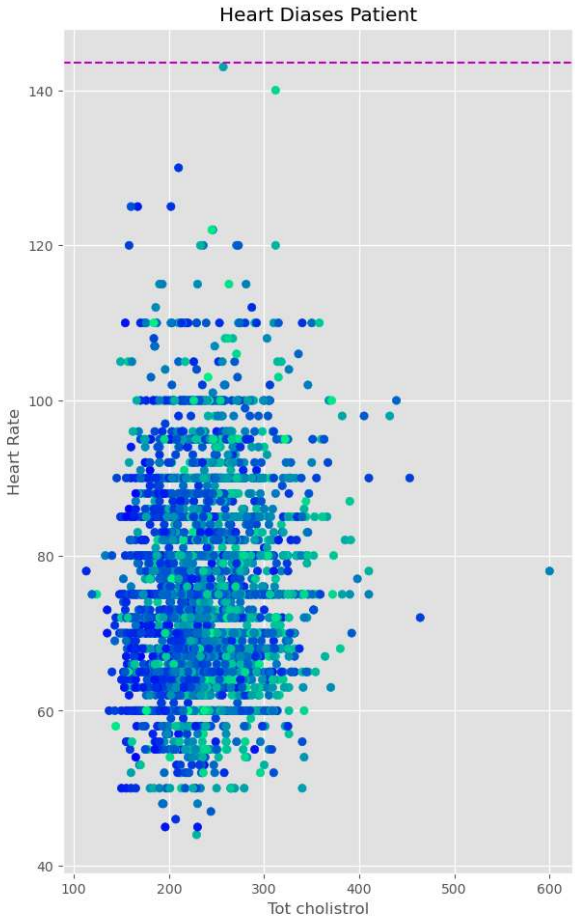
In [27]:
```
heart.head(2)
```

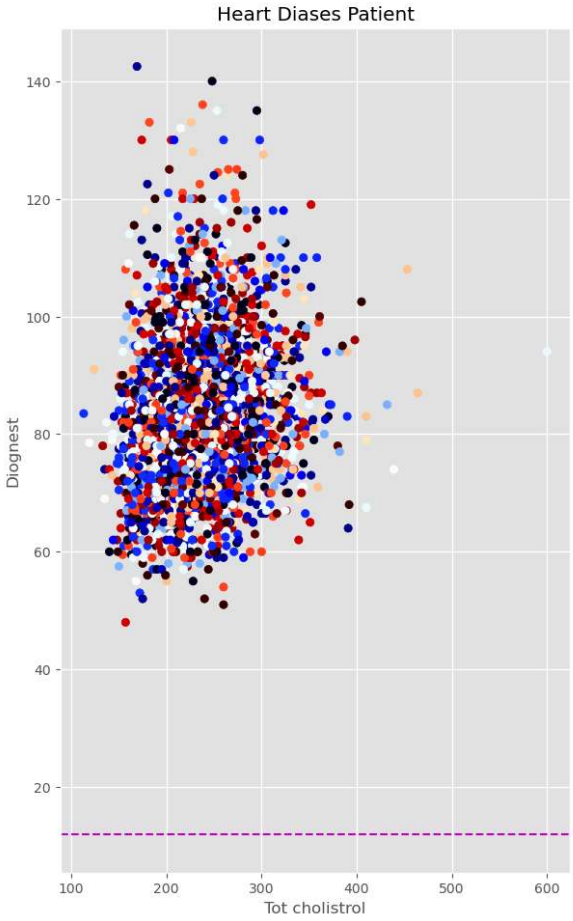
Out[27]:

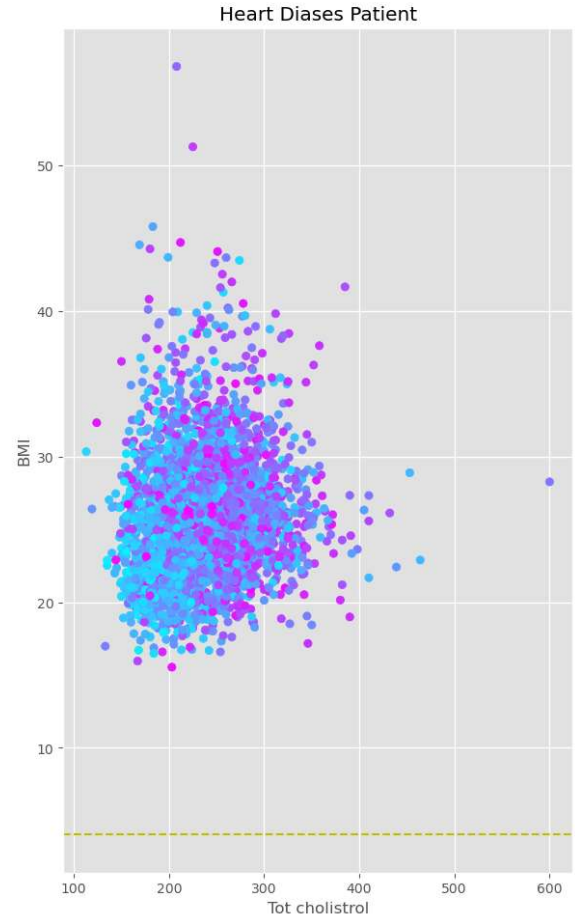
	Gender	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentHyp	diabetes	totC
0	Male	39	postgraduate	0	0.0	0.0	0	0	19
1	Female	46	primaryschool	0	0.0	0.0	0	0	25

In [29]:
```
fig,((h_1,h_2),(h_3,h_4))=plt.subplots(nrows=2,ncols=2,figsize=(15,25))

#plotting add the data
axis=h_1.scatter(x=heart['totChol'],
                 y=heart['sysBP'],
                 c=heart['age'],
                 cmap='plasma')
axis=h_2.scatter(x=heart['totChol'],
                 y=heart['heartRate'],
                 c=heart['age'],
                 cmap='winter')
axis=h_3.scatter(x=heart['totChol'],
                 y=heart['diaBP'],
                 c=heart['age'],
                 cmap='flag')
axis=h_4.scatter(x=heart['totChol'],
                 y=heart['BMI'],
                 c=heart['age'],
                 cmap='cool')
# add the title element of data
h_1.set(title='Heart Diases Patient',
       xlabel='Tot cholistrol',
       ylabel='Sybp')
h_2.set(title='Heart Diases Patient',
       xlabel='Tot cholistrol',
       ylabel='Heart Rate')
h_3.set(title='Heart Diases Patient',
       xlabel='Tot cholistrol',
       ylabel='Diognest')
h_4.set(title='Heart Diases Patient',
       xlabel='Tot cholistrol',
       ylabel='BMI');
# add and the check the statistic Data
h_1.axhline(y=heart['sysBP'].mean(),
            linestyle='--',
            color='m')
h_2.axhline(y=heart['heartRate'].var(),
            linestyle='--',
            color='m')
h_3.axhline(y=heart['diaBP'].std(),
            linestyle='--',
            color='m')
h_4.axhline(y=heart['BMI'].std(),
            linestyle='--',
            color='y')


axis;
```


Heart Diases Patient
Sybp
Tot cholistrol


Heart Diases Patient
Heart Rate
Tot cholistrol


Heart Diases Patient
Diognest
Tot cholistrol


Heart Diases Patient
BMI
Tot cholistrol

In [ ]:

In [ ]: