

Heart Attack prediction

January 9, 2025

```
[36]: import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
```

```
[38]: data=pd.read_excel('heart_data_500_samples.xlsx')
print(data.head())
print(data.info())
```

	Age	Sex	Chest Pain Type	Blood Pressure	Cholesterol	\
0	67	male	No chest pain	176	148	
1	57	male	Typical chest pain	155	551	
2	43	male	No chest pain	125	519	
3	71	male	No chest pain	123	285	
4	36	female	No chest pain	122	488	

	Fasting Blood Sugar > 120 mg/dl	Resting ECG	\
0	1	Abnormal heart wave (ST-T wave issue)	
1	0	Abnormal heart wave (ST-T wave issue)	
2	1	Normal	
3	0	Possible heart muscle enlargement	
4	1	Abnormal heart wave (ST-T wave issue)	

	Max Heart Rate Achieved	Exercise-Induced Angina	ST Depression	\
0	168	Yes	5.6	
1	98	Yes	4.2	
2	113	Yes	0.8	
3	156	No	6.2	
4	87	Yes	3.3	

	Slope of ST Segment	Number of Major Vessels	Thalassemia	\
0	Downward slope	1	Normal	
1	Flat	3	Fixed issue	
2	Upward slope	0	Normal	
3	Downward slope	0	Fixed issue	
4	Downward slope	2	Reversible issue	

	Target
0	No major blockage

```

1 More than 50% blockage
2 More than 50% blockage
3     No major blockage
4     No major blockage
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 500 entries, 0 to 499
Data columns (total 14 columns):
#   Column                                     Non-Null Count  Dtype
---  -
0   Age                                         500 non-null    int64
1   Sex                                         500 non-null    object
2   Chest Pain Type                           500 non-null    object
3   Blood Pressure                             500 non-null    int64
4   Cholesterol                               500 non-null    int64
5   Fasting Blood Sugar > 120 mg/dl          500 non-null    int64
6   Resting ECG                               500 non-null    object
7   Max Heart Rate Achieved                   500 non-null    int64
8   Exercise-Induced Angina                   500 non-null    object
9   ST Depression                             500 non-null    float64
10  Slope of ST Segment                       500 non-null    object
11  Number of Major Vessels                   500 non-null    int64
12  Thalassemia                              500 non-null    object
13  Target                                     500 non-null    object
dtypes: float64(1), int64(6), object(7)
memory usage: 54.8+ KB
None

```

```

[39]: print(data.isnull().sum())
      data1=data.dropna()
      print(data1.describe())

```

```

Age                                         0
Sex                                         0
Chest Pain Type                           0
Blood Pressure                             0
Cholesterol                               0
Fasting Blood Sugar > 120 mg/dl          0
Resting ECG                               0
Max Heart Rate Achieved                   0
Exercise-Induced Angina                   0
ST Depression                             0
Slope of ST Segment                       0
Number of Major Vessels                   0
Thalassemia                              0
Target                                     0
dtype: int64

```

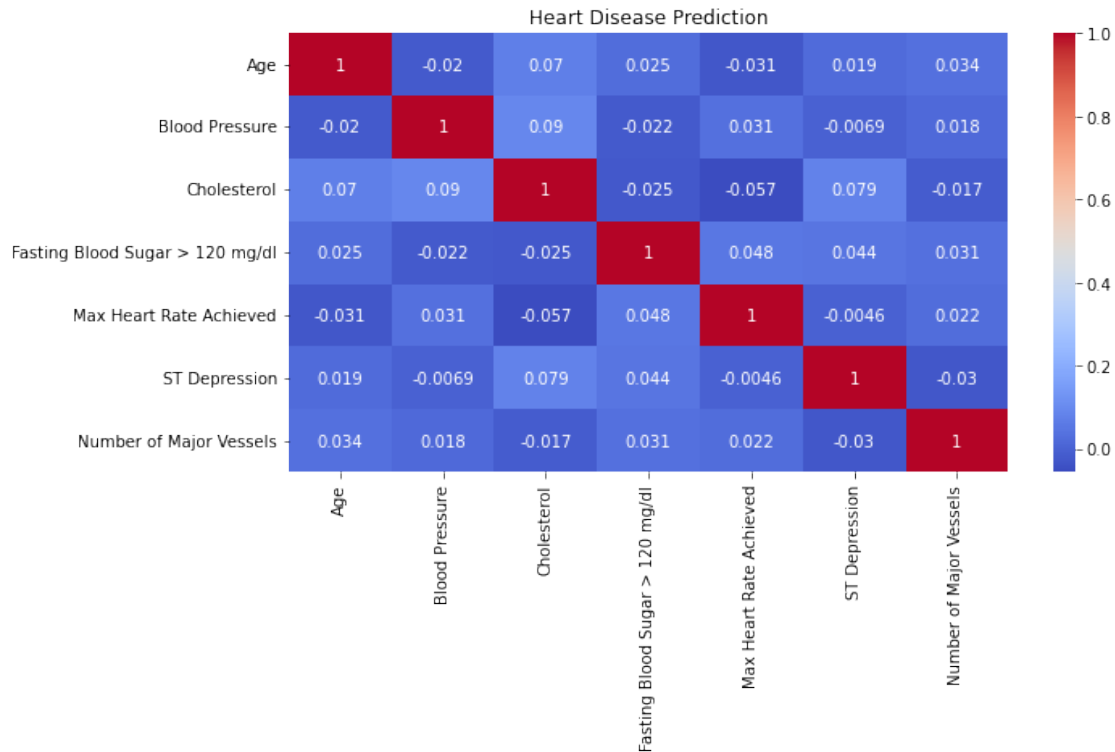
	Age	Blood Pressure	Cholesterol	\
count	500.000000	500.000000	500.000000	

mean	52.980000	145.80200	349.134000
std	13.800598	30.52058	130.505891
min	29.000000	94.00000	126.000000
25%	42.000000	119.00000	240.500000
50%	54.000000	146.00000	351.500000
75%	64.000000	174.00000	463.500000
max	76.000000	199.00000	563.000000

	Fasting Blood Sugar > 120 mg/dl	Max Heart Rate Achieved \
count	500.000000	500.000000
mean	0.522000	137.414000
std	0.500016	38.168472
min	0.000000	71.000000
25%	0.000000	105.000000
50%	1.000000	138.000000
75%	1.000000	171.000000
max	1.000000	201.000000

	ST Depression	Number of Major Vessels
count	500.000000	500.000000
mean	3.183000	1.514000
std	1.763823	1.133302
min	0.000000	0.000000
25%	1.700000	0.000000
50%	3.200000	2.000000
75%	4.725000	3.000000
max	6.200000	3.000000

```
[41]: plt.figure(figsize=(10,5))
sns.heatmap(data.corr(),annot=True,cmap='coolwarm')
plt.title('Heart Disease Prediction')
plt.show()
```



```
[42]: high_risk = data[(data['Cholesterol'] > 240) & (data['Blood Pressure'] > 140)]
print(pd.DataFrame(high_risk))
```

	Age	Sex	Chest Pain Type	Blood Pressure	Cholesterol	\
1	57	male	Typical chest pain	155	551	
5	49	male	Non-chest pain	142	562	
16	50	male	No chest pain	159	349	
21	66	female	Non-chest pain	156	358	
26	50	female	No chest pain	148	313	
..	
488	51	male	No chest pain	146	415	
490	33	male	No chest pain	193	436	
491	64	female	Unusual chest pain	156	244	
494	38	female	No chest pain	153	539	
498	33	female	Unusual chest pain	151	261	

	Fasting Blood Sugar > 120 mg/dl	Resting ECG	\
1	0	Abnormal heart wave (ST-T wave issue)	
5	0	Normal	
16	0	Abnormal heart wave (ST-T wave issue)	
21	1	Abnormal heart wave (ST-T wave issue)	
26	0	Possible heart muscle enlargement	
..	

488	0	Abnormal heart wave (ST-T wave issue)
490	1	Possible heart muscle enlargement
491	0	Abnormal heart wave (ST-T wave issue)
494	1	Abnormal heart wave (ST-T wave issue)
498	0	Normal

	Max Heart Rate Achieved	Exercise-Induced Angina	ST Depression \
1	98	Yes	4.2
5	168	No	2.4
16	144	No	1.1
21	146	Yes	4.5
26	133	No	6.0
..
488	163	Yes	5.5
490	124	Yes	4.4
491	112	No	5.5
494	91	No	4.7
498	117	Yes	0.8

	Slope of ST Segment	Number of Major Vessels	Thalassemia \
1	Flat	3	Fixed issue
5	Flat	1	Reversible issue
16	Downward slope	2	Reversible issue
21	Upward slope	3	Fixed issue
26	Flat	1	Normal
..
488	Downward slope	3	Normal
490	Flat	2	Reversible issue
491	Upward slope	1	Reversible issue
494	Downward slope	2	Reversible issue
498	Downward slope	1	Fixed issue

	Target
1	More than 50% blockage
5	More than 50% blockage
16	More than 50% blockage
21	More than 50% blockage
26	More than 50% blockage
..	...
488	More than 50% blockage
490	More than 50% blockage
491	No major blockage
494	More than 50% blockage
498	No major blockage

[207 rows x 14 columns]