In [1]:
```
import pandas as pd
```

In [2]:

In [5]:
```
df = pd.read_csv("heart1.csv")
```

Out[5]:

In [7]:
```
df.shape
```

Out[7]:

```
(1025, 14)
```

```
df
```

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca
0	52	1	0	125.0	212	0	1	168	0	1.0	2	2
1	52	1	0	125.0	87	0	1	168	0	1.0	2	2
2	70	1	0	145.0	174	0	1	125	1	2.6	0	0
3	61	1	0	148.0	203	0	1	161	0	0.0	2	1
4	62	0	0	138.0	294	1	1	106	0	1.9	1	3
...	...	...	...	...	...	...	...	...	...	...	...	...
1020	59	1	1	140.0	221	0	1	164	1	0.0	2	0
1021	60	1	0	125.0	258	0	0	141	1	2.8	1	1
1022	47	1	0	110.0	275	0	0	118	1	1.0	1	1
1023	50	0	0	110.0	254	0	0	159	0	0.0	2	0
1024	54	1	0	120.0	188	0	1	113	0	1.4	1	1

1025 rows × 14 columns

In [9]:
```
print(df.to_string())
```

```
      age  sex  cp  trestbps  chol  fbs  restecg  thalach  exang  oldpeak  slope ca
thal  target
0      52    1   0     125.0   212    0        1      168      0      1.0      2
2     3       0
1      52    1   0     125.0    87    0        1      168      0      1.0      2
2      3       0
```

```
2      70    1   0     145.0   174    0        1      125      1      2.6      0
0     3       0
3      61    1   0     148.0   203    0        1      161      0      0.0      2
1     3       0
4      62    0   0     138.0   294    1        1      106      0      1.9      1
3     2       0
5      58    0   0     100.0   248    0        0      122      0      1.0      1
0     2       1
6      58    1   0       NaN   318    0        2      140      0      4.4      0
3     1       0
7      55    1   0     160.0   289    0        0      145      1      0.8      1
1     3       0
8      46    1   0     120.0   249    0        0      144      0      0.8      2
0     3       0
9      54    1   0     122.0   286    0        0      116      1      3.2      1
2     2       0
10     71    0   0     112.0   149    0        1      125      0      1.6      1
0     2       1
11     43    0   0     132.0   341    1        0      136      1      3.0      1
0     3       0
12     34    0   1     118.0   210    0        1      192      0      0.7      2
0     2       1
13     51    1   0     140.0   298    0        1      122      1      4.2      1
3     3       0
14     52    1   0     128.0   204    1        1      156      1      1.0      1
0     0       0
15     34    0   1     118.0   210    0        1      192      0      0.7      2
0     2       1
16     51    0   2     140.0   308    0        0      142      0      1.5      2
1     2       1
17     54    1   0     124.0   266    0        0      109      1      2.2      1
1     3       0
18     50    0   1     120.0   244    0        1      162      0      1.1      2
0     2       1
19     58    1   2     140.0   211    1        0      165      0      0.0      2
0     2       1
20     60    1   2     140.0   185    0        0      155      0      3.0      1
0     2       0
21     67    0   0     106.0   223    0        1      142      0      0.3      2
2     2       1
22     45    1   0     104.0   208    0        0      148      1      3.0      1
0     2       1
23     63    0   2     135.0   252    0        0      172      0      0.0      2
0     2       1
```

```
24    42   0   2    120.0  209   0       1      173     0      0.0     1
0     2      1
25    61   0   0    145.0  307   0       0      146     1      1.0     1
0     3      0
26    44   1   2    130.0  233   0       1      179     1      0.4     2
0     2      1
27    58   0   1    136.0  319   1       0      152     0      0.0     2
2     2      0
28    56   1   2    130.0  256   1       0      142     1      0.6     1
1     1      0
29    55   0   0    180.0  327   0       2      117     1      3.4     1
0     2      0
30    44   1   0    120.0  169   0       1      144     1      2.8     0
0     1      0
31    50   0   1    120.0  244   0       1      162     0      1.1     2
0     2      1
32    57   1   0    130.0  131   0       1      115     1      1.2     1
1     3      0
33    70   1   2    160.0  269   0       1      112     1      2.9     1
1     3      0
34    50   1   2    129.0  196   0       1      163     0      0.0     2
0     2      1
35    46   1   2    150.0  231   0       1      147     0      3.6     1
0     2      0
36    51   1   3    125.0  213   0       0      125     1      1.4     2
1     2      1
37    59   1   0    138.0  271   0       0      182     0      0.0     2
0     2      1
38    64   1   0    128.0  263   0       1      105     1      0.2     1
1     3      1
39    57   1   2    128.0  229   0       0      150     0      0.4     1
1     3      0
40    65   0   2    160.0  360   0       0      151     0      0.8     2
0     2      1
41    54   1   2    120.0  258   0       0      147     0      0.4     1
0     3      1
42    61   0   0    130.0  330   0       0      169     0      0.0     2
0     2      0
43    46   1   0    120.0  249   0       0      144     0      0.8     2
0     3      0
44    55   0   1    132.0  342   0       1      166     0      1.2     2
0     2      1
45    42   1   0    140.0  226   0       1      178     0      0.0     2
0     2      1
```

```
46     41    1   1     135.0   203    0        1      132      0      0.0      1
0     1       1
47     66    0   0     178.0   228    1        1      165      1      1.0      1
2     3       0
48     66    0   2     146.0   278    0        0      152      0      0.0      1
1     2       1
49     60    1   0     117.0   230    1        1      160      1      1.4      2
2     3       0
50     58    0   3     150.0   283    1        0      162      0      1.0      2
0     2       1
51     57    0   0     140.0   241    0        1      123      1      0.2      1
0     3       0
52     38    1   2     138.0   175    0        1      173      0      0.0      2
4     2       1
53     49    1   2     120.0   188    0        1      139      0      2.0      1
3     3       0
54     55    1   0     140.0   217    0        1      111      1      5.6      0
0     3       0
55     55    1   0     140.0   217    0        1      111      1      5.6      0
0     3       0
56     56    1   3     120.0   193    0        0      162      0      1.9      1
0     3       1
57     48    1   1     130.0   245    0        0      180      0      0.2      1
0     2       1
58     67    1   2     152.0   212    0        0      150      0      0.8      1
0     3       0
59     57    1   1     154.0   232    0        0      164      0      0.0      2
1     2       0
60     29    1   1     130.0   204    0        0      202      0      0.0      2
0     2       1
61     66    0   2     146.0   278    0        0      152      0      0.0      1
1     2       1
62     67    1   0     100.0   299    0        0      125      1      0.9      1
2     2       0
63     59    1   2     150.0   212    1        1      157      0      1.6      2
0     2       1
64     29    1   1     130.0   204    0        0      202      0      0.0      2
0     2       1
65     59    1   3     170.0   288    0        0      159      0      0.2      1
0     3       0
66     53    1   2     130.0   197    1        0      152      0      1.2      0
0     2       1
67     42    1   0     136.0   315    0        1      125      1      1.8      1
0     1       0
```

```
68    37    0   2    120.0   215    0       1       170      0       0.0      2
0     2      1
69    62    0   0    160.0   164    0       0       145      0       6.2      0
3     3      0
70    59    1   0    170.0   326    0       0       140      1       3.4      0
0     3      0
71    61    1   0    140.0   207    0       0       138      1       1.9      2
1     3      0
72    56    1   0    125.0   249    1       0       144      1       1.2      1
1     2      0
73    59    1   0    140.0   177    0       1       162      1       0.0      2
1     3      0
74    48    1   0    130.0   256    1       0       150      1       0.0      2
2     3      0
75    47    1   2    138.0   257    0       0       156      0       0.0      2
0     2      1
76    48    1   2    124.0   255    1       1       175      0       0.0      2
2     2      1
77    63    1   0    140.0   187    0       0       144      1       4.0      2
2     3      0
78    52    1   1    134.0   201    0       1       158      0       0.8      2
1     2      1
79    52    1   1    134.0   201    0       1       158      0       0.8      2
1     2      1
80    50    1   2    140.0   233    0       1       163      0       0.6      1
1     3      0
81    49    1   2    118.0   149    0       0       126      0       0.8      2
3     2      0
82    46    1   2    150.0   231    0       1       147      0       3.6      1
0     2      0
83    38    1   2    138.0   175    0       1       173      0       0.0      2
4     2      1
84    37    0   2    120.0   215    0       1       170      0       0.0      2
0     2      1
85    44    1   1    120.0   220    0       1       170      0       0.0      2
0     2      1
86    58    1   2    140.0   211    1       0       165      0       0.0      2
0     2      1
87    59    0   0    174.0   249    0       1       143      1       0.0      1
0     2      0
88    62    0   0    140.0   268    0       0       160      0       3.6      0
2     2      0
89    68    1   0    144.0   193    1       1       141      0       3.4      1
2     3      0
```

```
90     54    0   2     108.0   267    0        0      167      0      0.0      2
0     2       1
91     62    0   0     124.0   209    0        1      163      0      0.0      2
0     2       1
92     63    1   0     140.0   187    0        0      144      1      4.0      2
2     3       0
93     44    1   0     120.0   169    0        1      144      1      2.8      0
0     1       0
94     62    1   1     128.0   208    1        0      140      0      0.0      2
0     2       1
95     45    0   0     138.0   236    0        0      152      1      0.2      1
0     2       1
96     57    0   0     128.0   303    0        0      159      0      0.0      2
1     2       1
97     53    1   0     123.0   282    0        1       95      1      2.0      1
2     3       0
98     65    1   0     110.0   248    0        0      158      0      0.6      2
2     1       0
99     76    0   2     140.0   197    0        2      116      0      1.1      1
0     2       1
100    43    0   2     122.0   213    0        1      165      0      0.2      1
0     2       1
101    57    1   2     150.0   126    1        1      173      0      0.2      2
1     3       1
102    54    1   1     108.0   309    0        1      156      0      0.0      2
0     3       1
103    47    1   2     138.0   257    0        0      156      0      0.0      2
0     2       1
104    52    1   3     118.0   186    0        0      190      0      0.0      1
0     1       1
105    47    1   0     110.0   275    0        0      118      1      1.0      1
1     2       0
106    51    1   0     140.0   299    0        1      173      1      1.6      2
0     3       0
107    62    1   1     120.0   281    0        0      103      0      1.4      1
1     3       0
108    40    1   0     152.0   223    0        1      181      0      0.0      2
0     3       0
109    54    1   0     110.0   206    0        0      108      1      0.0      1
1     2       0
110    44    1   0     110.0   197    0        0      177      0      0.0      2
1     2       0
111    53    1   0     142.0   226    0        0      111      1      0.0      2
0     3       1
```

```
112    48    1   0     130.0   256    1        0      150      1      0.0      2
2     3       0
113    57    1   0     110.0   335    0        1      143      1      3.0      1
1     3       0
114    59    1   2     126.0   218    1        1      134      0      2.2      1
1     1       0
115    61    0   0     145.0   307    0        0      146      1      1.0      1
0     3       0
116    63    1   0     130.0   254    0        0      147      0      1.4      1
1     3       0
117    43    1   0     120.0   177    0        0      120      1      2.5      1
0     3       0
118    29    1   1     130.0   204    0        0      202      0      0.0      2
0     2       1
119    42    1   1     120.0   295    0        1      162      0      0.0      2
0     2       1
120    54    1   1     108.0   309    0        1      156      0      0.0      2
0     3       1
121    44    1   0     120.0   169    0        1      144      1      2.8      0
0     1       0
122    60    1   0     145.0   282    0        0      142      1      2.8      1
2     3       0
123    65    0   2     140.0   417    1        0      157      0      0.8      2
1     2       1
124    61    1   0     120.0   260    0        1      140      1      3.6      1
1     3       0
125    60    0   3     150.0   240    0        1      171      0      0.9      2
0     2       1
126    66    1   0     120.0   302    0        0      151      0      0.4      1
0     2       1
127    53    1   2     130.0   197    1        0      152      0      1.2      0
0     2       1
128    52    1   2     138.0   223    0        1      169      0      0.0      2
4     2       1
129    57    1   0     140.0   192    0        1      148      0      0.4      1
0     1       1
130    60    0   3     150.0   240    0        1      171      0      0.9      2
0     2       1
131    51    0   2     130.0   256    0        0      149      0      0.5      2
0     2       1
132    41    1   1     135.0   203    0        1      132      0      0.0      1
0     1       1
133    50    1   2     129.0   196    0        1      163      0      0.0      2
0     2       1
```

```
134    54    1   1     108.0   309    0        1      156      0      0.0      2
0     3       1
135    58    0   0     170.0   225    1        0      146      1      2.8      1
2     1       0
136    55    0   1     132.0   342    0        1      166      0      1.2      2
0     2       1
137    64    0   0     180.0   325    0        1      154      1      0.0      2
0     2       1
138    47    1   2     138.0   257    0        0      156      0      0.0      2
0     2       1
139    41    1   1     110.0   235    0        1      153      0      0.0      2
0     2       1
140    57    1   0     152.0   274    0        1       88      1      1.2      1
1     3       0
141    63    0   0     124.0   197    0        1      136      1      0.0      1
0     2       0
142    61    1   3     134.0   234    0        1      145      0      2.6      1
2     2       0
143    34    1   3     118.0   182    0        0      174      0      0.0      2
0     2       1
144    47    1   0     112.0   204    0        1      143      0      0.1      2
0     2       1
145    40    1   0     110.0   167    0        0      114      1      2.0      1
0     3       0
146    51    0   2     120.0   295    0        0      157      0      0.6      2
0     2       1
147    41    1   0     110.0   172    0        0      158      0      0.0      2
0     3       0
148    52    1   3     152.0   298    1        1      178      0      1.2      1
0     3       1
149    39    1   2     140.0   321    0        0      182      0      0.0      2
0     2       1
150    58    1   0     114.0   318    0        2      140      0      4.4      0
3     1       0
151    54    1   1     192.0   283    0        0      195      0      0.0      2
1     3       0
152    58    1   0     125.0   300    0        0      171      0      0.0      2
2     3       0
153    54    1   2     120.0   258    0        0      147      0      0.4      1
0     3       1
154    63    1   0     130.0   330    1        0      132      1      1.8      2
3     3       0
155    54    1   1     108.0   309    0        1      156      0      0.0      2
0     3       1
```

```
156   40   1   3    140.0   199   0       1       178      1       1.4      2
0     3       1
157   54   1   2    120.0   258   0       0       147      0       0.4      1
0     3       1
158   67   0   2    115.0   564   0       0       160      0       1.6      1
0     3       1
159   41   1   1    120.0   157   0       1       182      0       0.0      2
0     2       1
160   77   1   0    125.0   304   0       0       162      1       0.0      2
3     2       0
161   51   1   2    100.0   222   0       1       143      1       1.2      1
0     2       1
162   77   1   0    125.0   304   0       0       162      1       0.0      2
3     2       0
163   48   1   0    124.0   274   0       0       166      0       0.5      1
0     3       0
164   56   1   0    125.0   249   1       0       144      1       1.2      1
1     2       0
165   59   1   0    170.0   326   0       0       140      1       3.4      0
0     3       0
166   56   1   0    132.0   184   0       0       105      1       2.1      1
1     1       0
167   57   0   0    120.0   354   0       1       163      1       0.6      2
0     2       1
168   43   1   2    130.0   315   0       1       162      0       1.9      2
1     2       1
169   45   0   1    112.0   160   0       1       138      0       0.0      1
0     2       1
170   43   1   0    150.0   247   0       1       171      0       1.5      2
0     2       1
171   56   1   0    130.0   283   1       0       103      1       1.6      0
0     3       0
172   56   1   1    120.0   240   0       1       169      0       0.0      0
0     2       1
173   39   0   2     94.0   199   0       1       179      0       0.0      2
0     2       1
174   54   1   0    110.0   239   0       1       126      1       2.8      1
1     3       0
175   56   0   0    200.0   288   1       0       133      1       4.0      0
2     3       0
176   56   1   0    130.0   283   1       0       103      1       1.6      0
0     3       0
177   64   1   0    120.0   246   0       0        96      1       2.2      0
1     2       0
```

```
178    44    1   0     110.0   197    0        0      177      0      0.0      2
1     2       0
179    56    0   0     134.0   409    0        0      150      1      1.9      1
2     3       0
180    63    1   0     140.0   187    0        0      144      1      4.0      2
2     3       0
181    64    1   3     110.0   211    0        0      144      1      1.8      1
0     2       1
182    60    1   0     140.0   293    0        0      170      0      1.2      1
2     3       0
183    42    1   2     130.0   180    0        1      150      0      0.0      2
0     2       1
184    45    1   1     128.0   308    0        0      170      0      0.0      2
0     2       1
185    57    1   0     165.0   289    1        0      124      0      1.0      1
3     3       0
186    40    1   0     110.0   167    0        0      114      1      2.0      1
0     3       0
187    56    1   0     125.0   249    1        0      144      1      1.2      1
1     2       0
188    63    1   0     130.0   254    0        0      147      0      1.4      1
1     3       0
189    64    1   2     125.0   309    0        1      131      1      1.8      1
0     3       0
190    41    1   2     112.0   250    0        1      179      0      0.0      2
0     2       1
191    56    1   1     130.0   221    0        0      163      0      0.0      2
0     3       1
192    67    0   2     115.0   564    0        0      160      0      1.6      1
0     3       1
193    69    1   3     160.0   234    1        0      131      0      0.1      1
1     2       1
194    67    1   0     160.0   286    0        0      108      1      1.5      1
3     2       0
195    59    1   2     150.0   212    1        1      157      0      1.6      2
0     2       1
196    58    1   0     100.0   234    0        1      156      0      0.1      2
1     3       0
197    45    1   0     115.0   260    0        0      185      0      0.0      2
0     2       1
198    60    0   2     102.0   318    0        1      160      0      0.0      2
1     2       1
199    50    1   0     144.0   200    0        0      126      1      0.9      1
0     3       0
```

```
200    62    0   0     124.0   209    0        1      163      0      0.0      2
0     2       1
201    34    1   3     118.0   182    0        0      174      0      0.0      2
0     2       1
202    52    1   3     152.0   298    1        1      178      0      1.2      1
0     3       1
203    64    1   3     170.0   227    0        0      155      0      0.6      1
0     3       1
204    66    0   2     146.0   278    0        0      152      0      0.0      1
1     2       1
205    42    1   3     148.0   244    0        0      178      0      0.8      2
2     2       1
206    59    1   2     126.0   218    1        1      134      0      2.2      1
1     1       0
207    41    1   2     112.0   250    0        1      179      0      0.0      2
0     2       1
208    38    1   2     138.0   175    0        1      173      0      0.0      2
4     2       1
209    62    1   1     120.0   281    0        0      103      0      1.4      1
1     3       0
210    42    1   2     120.0   240    1        1      194      0      0.8      0
0     3       1
211    67    1   0     100.0   299    0        0      125      1      0.9      1
2     2       0
212    50    1   0     150.0   243    0        0      128      0      2.6      1
0     3       0
213    43    1   2     130.0   315    0        1      162      0      1.9      2
1     2       1
214    45    1   1     128.0   308    0        0      170      0      0.0      2
0     2       1
215    49    1   1     130.0   266    0        1      171      0      0.6      2
0     2       1
216    65    1   0     135.0   254    0        0      127      0      2.8      1
1     3       0
217    41    1   1     120.0   157    0        1      182      0      0.0      2
0     2       1
218    46    1   0     140.0   311    0        1      120      1      1.8      1
2     3       0
219    54    1   0     122.0   286    0        0      116      1      3.2      1
2     2       0
220    57    0   1     130.0   236    0        0      174      0      0.0      1
1     2       0
221    63    1   0     130.0   254    0        0      147      0      1.4      1
1     3       0
```

```
222    64    1   3     110.0   211    0        0      144      1      1.8      1
0     2       1
223    39    0   2      94.0   199    0        1      179      0      0.0      2
0     2       1
224    51    1   0     140.0   261    0        0      186      1      0.0      2
0     2       1
225    54    1   2     150.0   232    0        0      165      0      1.6      2
0     3       1
226    49    1   2     118.0   149    0        0      126      0      0.8      2
3     2       0
227    44    0   2     118.0   242    0        1      149      0      0.3      1
1     2       1
228    52    1   1     128.0   205    1        1      184      0      0.0      2
0     2       1
229    66    0   0     178.0   228    1        1      165      1      1.0      1
2     3       0
230    58    1   0     125.0   300    0        0      171      0      0.0      2
2     3       0
231    56    1   1     120.0   236    0        1      178      0      0.8      2
0     2       1
232    60    1   0     125.0   258    0        0      141      1      2.8      1
1     3       0
233    41    0   1     126.0   306    0        1      163      0      0.0      2
0     2       1
234    49    0   0     130.0   269    0        1      163      0      0.0      2
0     2       1
235    64    1   3     170.0   227    0        0      155      0      0.6      1
0     3       1
236    49    1   2     118.0   149    0        0      126      0      0.8      2
3     2       0
237    57    1   1     124.0   261    0        1      141      0      0.3      2
0     3       0
238    60    1   0     117.0   230    1        1      160      1      1.4      2
2     3       0
239    62    0   0     150.0   244    0        1      154      1      1.4      1
0     2       0
240    54    0   1     132.0   288    1        0      159      1      0.0      2
1     2       1
241    67    1   2     152.0   212    0        0      150      0      0.8      1
0     3       0
242    38    1   2     138.0   175    0        1      173      0      0.0      2
4     2       1
243    60    1   2     140.0   185    0        0      155      0      3.0      1
0     2       0
```

```
244    51    1   2     125.0   245    1        0      166      0      2.4      1
0     2       1
245    44    1   1     130.0   219    0        0      188      0      0.0      2
0     2       1
246    54    1   1     192.0   283    0        0      195      0      0.0      2
1     3       0
247    46    1   0     140.0   311    0        1      120      1      1.8      1
2     3       0
248    39    0   2     138.0   220    0        1      152      0      0.0      1
0     2       1
249    42    1   2     130.0   180    0        1      150      0      0.0      2
0     2       1
250    47    1   0     110.0   275    0        0      118      1      1.0      1
1     2       0
251    45    0   1     112.0   160    0        1      138      0      0.0      1
0     2       1
252    55    1   0     132.0   353    0        1      132      1      1.2      1
1     3       0
253    57    1   0     165.0   289    1        0      124      0      1.0      1
3     3       0
254    35    1   0     120.0   198    0        1      130      1      1.6      1
0     3       0
255    62    0   0     140.0   394    0        0      157      0      1.2      1
0     2       1
256    35    0   0     138.0   183    0        1      182      0      1.4      2
0     2       1
257    64    0   0     180.0   325    0        1      154      1      0.0      2
0     2       1
258    38    1   3     120.0   231    0        1      182      1      3.8      1
0     3       0
259    66    1   0     120.0   302    0        0      151      0      0.4      1
0     2       1
260    44    1   2     120.0   226    0        1      169      0      0.0      2
0     2       1
261    54    1   2     150.0   232    0        0      165      0      1.6      2
0     3       1
262    48    1   0     122.0   222    0        0      186      0      0.0      2
0     2       1
263    55    0   1     132.0   342    0        1      166      0      1.2      2
0     2       1
264    58    0   0     170.0   225    1        0      146      1      2.8      1
2     1       0
265    45    1   0     104.0   208    0        0      148      1      3.0      1
0     2       1
```

```
266    53    1   0    123.0   282    0        1       95      1      2.0      1
2     3       0
267    67    1   0    120.0   237    0        1       71      0      1.0      1
0     2       0
268    58    1   2    132.0   224    0        0      173      0      3.2      2
2     3       0
269    71    0   2    110.0   265    1        0      130      0      0.0      2
1     2       1
270    43    1   0    110.0   211    0        1      161      0      0.0      2
0     3       1
271    44    1   1    120.0   263    0        1      173      0      0.0      2
0     3       1
272    39    0   2    138.0   220    0        1      152      0      0.0      1
0     2       1
273    54    1   0    110.0   206    0        0      108      1      0.0      1
1     2       0
274    66    1   0    160.0   228    0        0      138      0      2.3      2
0     1       1
275    56    1   0    130.0   283    1        0      103      1      1.6      0
0     3       0
276    57    1   0    132.0   207    0        1      168      1      0.0      2
0     3       1
277    44    1   1    130.0   219    0        0      188      0      0.0      2
0     2       1
278    55    1   0    160.0   289    0        0      145      1      0.8      1
1     3       0
279    41    0   1    105.0   198    0        1      168      0      0.0      2
1     2       1
280    45    0   1    130.0   234    0        0      175      0      0.6      1
0     2       1
281    35    1   1    122.0   192    0        1      174      0      0.0      2
0     2       1
282    41    0   1    130.0   204    0        0      172      0      1.4      2
0     2       1
283    64    1   3    110.0   211    0        0      144      1      1.8      1
0     2       1
284    58    1   2    132.0   224    0        0      173      0      3.2      2
2     3       0
285    71    0   2    110.0   265    1        0      130      0      0.0      2
1     2       1
286    64    0   2    140.0   313    0        1      133      0      0.2      2
0     3       1
287    71    0   1    160.0   302    0        1      162      0      0.4      2
2     2       1
```

```
288    58    0   2     120.0   340    0        1      172      0      0.0      2
0     2       1
289    40    1   0     152.0   223    0        1      181      0      0.0      2
0     3       0
290    52    1   2     138.0   223    0        1      169      0      0.0      2
4     2       1
291    58    1   0     128.0   259    0        0      130      1      3.0      1
2     3       0
292    61    1   2     150.0   243    1        1      137      1      1.0      1
0     2       1
293    59    1   2     150.0   212    1        1      157      0      1.6      2
0     2       1
294    56    0   0     200.0   288    1        0      133      1      4.0      0
2     3       0
295    67    1   0     100.0   299    0        0      125      1      0.9      1
2     2       0
296    67    1   0     120.0   237    0        1       71      0      1.0      1
0     2       0
297    58    1   0     150.0   270    0        0      111      1      0.8      2
0     3       0
298    35    1   1     122.0   192    0        1      174      0      0.0      2
0     2       1
299    52    1   1     120.0   325    0        1      172      0      0.2      2
0     2       1
300    46    0   1     105.0   204    0        1      172      0      0.0      2
0     2       1
301    51    1   2      94.0   227    0        1      154      1      0.0      2
1     3       1
302    55    0   1     132.0   342    0        1      166      0      1.2      2
0     2       1
303    60    1   0     145.0   282    0        0      142      1      2.8      1
2     3       0
304    52    0   2     136.0   196    0        0      169      0      0.1      1
0     2       1
305    62    1   0     120.0   267    0        1       99      1      1.8      1
2     3       0
306    44    0   2     118.0   242    0        1      149      0      0.3      1
1     2       1
307    44    1   1     120.0   220    0        1      170      0      0.0      2
0     2       1
308    59    1   2     126.0   218    1        1      134      0      2.2      1
1     1       0
309    56    0   1     140.0   294    0        0      153      0      1.3      1
0     2       1
```

```
310    61    1   0     120.0   260    0        1      140      1      3.6      1
1     3       0
311    48    1   0     130.0   256    1        0      150      1      0.0      2
2     3       0
312    70    1   2     160.0   269    0        1      112      1      2.9      1
1     3       0
313    74    0   1     120.0   269    0        0      121      1      0.2      2
1     2       1
314    40    1   3     140.0   199    0        1      178      1      1.4      2
0     3       1
315    42    1   3     148.0   244    0        0      178      0      0.8      2
2     2       1
316    64    0   2     140.0   313    0        1      133      0      0.2      2
0     3       1
317    63    0   2     135.0   252    0        0      172      0      0.0      2
0     2       1
318    59    1   0     140.0   177    0        1      162      1      0.0      2
1     3       0
319    53    0   2     128.0   216    0        0      115      0      0.0      2
0     0       1
320    53    0   0     130.0   264    0        0      143      0      0.4      1
0     2       1
321    48    0   2     130.0   275    0        1      139      0      0.2      2
0     2       1
322    45    1   0     142.0   309    0        0      147      1      0.0      1
3     3       0
323    66    1   1     160.0   246    0        1      120      1      0.0      1
3     1       0
324    48    1   1     130.0   245    0        0      180      0      0.2      1
0     2       1
325    56    0   1     140.0   294    0        0      153      0      1.3      1
0     2       1
326    54    1   1     192.0   283    0        0      195      0      0.0      2
1     3       0
327    57    1   0     150.0   276    0        0      112      1      0.6      1
1     1       0
328    70    1   0     130.0   322    0        0      109      0      2.4      1
3     2       0
329    53    0   2     128.0   216    0        0      115      0      0.0      2
0     0       1
330    37    0   2     120.0   215    0        1      170      0      0.0      2
0     2       1
331    63    0   0     108.0   269    0        1      169      1      1.8      1
2     2       0
```

```
332    37    1   2     130.0   250    0        1      187      0      3.5      0
0     2       1
333    54    0   2     110.0   214    0        1      158      0      1.6      1
0     2       1
334    60    1   0     130.0   206    0        0      132      1      2.4      1
2     3       0
335    58    1   0     150.0   270    0        0      111      1      0.8      2
0     3       0
336    57    1   2     150.0   126    1        1      173      0      0.2      2
1     3       1
337    54    1   2     125.0   273    0        0      152      0      0.5      0
1     2       1
338    56    1   2     130.0   256    1        0      142      1      0.6      1
1     1       0
339    60    1   0     130.0   253    0        1      144      1      1.4      2
1     3       0
340    38    1   2     138.0   175    0        1      173      0      0.0      2
4     2       1
341    44    1   2     120.0   226    0        1      169      0      0.0      2
0     2       1
342    65    0   2     155.0   269    0        1      148      0      0.8      2
0     2       1
343    52    1   2     172.0   199    1        1      162      0      0.5      2
0     3       1
344    41    1   1     120.0   157    0        1      182      0      0.0      2
0     2       1
345    66    1   1     160.0   246    0        1      120      1      0.0      1
3     1       0
346    50    1   0     150.0   243    0        0      128      0      2.6      1
0     3       0
347    54    0   2     108.0   267    0        0      167      0      0.0      2
0     2       1
348    43    1   0     132.0   247    1        0      143      1      0.1      1
4     3       0
349    62    0   2     130.0   263    0        1       97      0      1.2      1
1     3       0
350    66    1   0     120.0   302    0        0      151      0      0.4      1
0     2       1
351    50    1   0     144.0   200    0        0      126      1      0.9      1
0     3       0
352    57    1   0     110.0   335    0        1      143      1      3.0      1
1     3       0
353    57    1   0     110.0   201    0        1      126      1      1.5      1
0     1       1
```

```
354    57    1   1     124.0   261    0        1      141      0      0.3      2
0     3       0
355    46    0   0     138.0   243    0        0      152      1      0.0      1
0     2       1
356    59    1   0     164.0   176    1        0       90      0      1.0      1
2     1       0
357    67    1   0     160.0   286    0        0      108      1      1.5      1
3     2       0
358    59    1   3     134.0   204    0        1      162      0      0.8      2
2     2       0
359    53    0   2     128.0   216    0        0      115      0      0.0      2
0     0       1
360    48    1   0     122.0   222    0        0      186      0      0.0      2
0     2       1
361    62    1   2     130.0   231    0        1      146      0      1.8      1
3     3       1
362    43    0   2     122.0   213    0        1      165      0      0.2      1
0     2       1
363    53    1   2     130.0   246    1        0      173      0      0.0      2
3     2       1
364    57    0   1     130.0   236    0        0      174      0      0.0      1
1     2       0
365    53    1   2     130.0   246    1        0      173      0      0.0      2
3     2       1
366    58    1   2     112.0   230    0        0      165      0      2.5      1
1     3       0
367    48    1   1     110.0   229    0        1      168      0      1.0      0
0     3       0
368    58    1   2     105.0   240    0        0      154      1      0.6      1
0     3       1
369    51    1   2     110.0   175    0        1      123      0      0.6      2
0     2       1
370    43    0   0     132.0   341    1        0      136      1      3.0      1
0     3       0
371    55    1   0     132.0   353    0        1      132      1      1.2      1
1     3       0
372    54    0   2     110.0   214    0        1      158      0      1.6      1
0     2       1
373    58    1   1     120.0   284    0        0      160      0      1.8      1
0     2       0
374    46    0   2     142.0   177    0        0      160      1      1.4      0
0     2       1
375    66    1   0     160.0   228    0        0      138      0      2.3      2
0     1       1
```

```
376    59    1   1     140.0   221    0        1      164      1      0.0      2
0     2       1
377    64    0   0     130.0   303    0        1      122      0      2.0      1
2     2       1
378    67    1   0     120.0   237    0        1       71      0      1.0      1
0     2       0
379    52    1   3     118.0   186    0        0      190      0      0.0      1
0     1       1
380    58    1   0     146.0   218    0        1      105      0      2.0      1
1     3       0
381    58    1   2     132.0   224    0        0      173      0      3.2      2
2     3       0
382    59    1   0     110.0   239    0        0      142      1      1.2      1
1     3       0
383    58    1   0     150.0   270    0        0      111      1      0.8      2
0     3       0
384    35    1   0     126.0   282    0        0      156      1      0.0      2
0     3       0
385    51    1   2     110.0   175    0        1      123      0      0.6      2
0     2       1
386    42    0   2     120.0   209    0        1      173      0      0.0      1
0     2       1
387    77    1   0     125.0   304    0        0      162      1      0.0      2
3     2       0
388    64    1   0     120.0   246    0        0       96      1      2.2      0
1     2       0
```

```
389    63    1   3     145.0   233    1        0      150      0      2.3      0
0     1       1
390    58    0   1     136.0   319    1        0      152      0      0.0      2
2     2       0
391    45    1   3     110.0   264    0        1      132      0      1.2      1
0     3       0
392    51    1   2     110.0   175    0        1      123      0      0.6      2
0     2       1
393    62    0   0     160.0   164    0        0      145      0      6.2      0
3     3       0
394    63    1   0     130.0   330    1        0      132      1      1.8      2
3     3       0
395    66    0   2     146.0   278    0        0      152      0      0.0      1
1     2       1
396    68    1   2     180.0   274    1        0      150      1      1.6      1
0     3       0
397    40    1   0     110.0   167    0        0      114      1      2.0      1
0     3       0
398    66    1   0     160.0   228    0        0      138      0      2.3      2
0     1       1
399    63    1   3     145.0   233    1        0      150      0      2.3      0
0     1       1
400    49    1   2     120.0   188    0        1      139      0      2.0      1
3     3       0
401    71    0   0     112.0   149    0        1      125      0      1.6      1
0     2       1
402    70    1   1     156.0   245    0        0      143      0      0.0      2
0     2       1
403    46    0   1     105.0   204    0        1      172      0      0.0      2
0     2       1
404    61    1   0     140.0   207    0        0      138      1      1.9      2
1     3       0
405    56    1   2     130.0   256    1        0      142      1      0.6      1
1     1       0
406    58    1   2     140.0   211    1        0      165      0      0.0      2
0     2       1
407    58    1   0     100.0   234    0        1      156      0      0.1      2
1     3       0
408    46    0   0     138.0   243    0        0      152      1      0.0      1
0     2       1
409    46    1   2     150.0   231    0        1      147      0      3.6      1
0     2       0
410    41    0   1     105.0   198    0        1      168      0      0.0      2
1     2       1
411    56    1   0     125.0   249    1        0      144      1      1.2      1
```

```
0     2       1
```

```
1     2       0
412    57    1   0     150.0   276    0        0      112      1      0.6      1
1     1       0
413    70    1   0     130.0   322    0        0      109      0      2.4      1
3     2       0
414    59    1   3     170.0   288    0        0      159      0      0.2      1
0     3       0
415    41    0   1     130.0   204    0        0      172      0      1.4      2
0     2       1
416    54    1   2     125.0   273    0        0      152      0      0.5      0
1     2       1
417    52    1   2     138.0   223    0        1      169      0      0.0      2
4     2       1
418    62    0   0     124.0   209    0        1      163      0      0.0      2
419    65    0   2     160.0   360    0        0      151      0      0.8      2
0     2       1
420    57    0   0     128.0   303    0        0      159      0      0.0      2
1     2       1
421    42    0   0     102.0   265    0        0      122      0      0.6      1
0     2       1
422    57    0   0     120.0   354    0        1      163      1      0.6      2
0     2       1
423    58    0   1     136.0   319    1        0      152      0      0.0      2
2     2       0
424    45    1   0     142.0   309    0        0      147      1      0.0      1
3     3       0
425    51    0   0     130.0   305    0        1      142      1      1.2      1
0     3       0
426    54    0   2     160.0   201    0        1      163      0      0.0      2
1     2       1
427    57    1   2     150.0   168    0        1      174      0      1.6      2
0     2       1
428    43    1   0     132.0   247    1        0      143      1      0.1      1
4     3       0
429    47    1   2     108.0   243    0        1      152      0      0.0      2
0     2       0
430    67    1   2     152.0   212    0        0      150      0      0.8      1
0     3       0
431    65    0   0     150.0   225    0        0      114      0      1.0      1
3     3       0
432    60    0   2     102.0   318    0        1      160      0      0.0      2
1     2       1
433    37    1   2     130.0   250    0        1      187      0      3.5      0
0     2       1
434    41    0   2     112.0   268    0        0      172      1      0.0      2
```

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0     2       1
```

```
0     2       1
435    57    0   0     120.0   354    0        1      163      1      0.6      2
0     2       1
436    59    0   0     174.0   249    0        1      143      1      0.0      1
0     2       0
437    67    1   0     120.0   229    0        0      129      1      2.6      1
2     3       0
438    47    1   2     130.0   253    0        1      179      0      0.0      2
0     2       1
439    58    1   1     120.0   284    0        0      160      0      1.8      1
0     2       0
440    62    0   0     150.0   244    0        1      154      1      1.4      1
0     2       0
441    60    1   0     140.0   293    0        0      170      0      1.2      1
2     3       0
442    57    1   0     152.0   274    0        1       88      1      1.2      1
1     3       0
443    57    1   2     150.0   168    0        1      174      0      1.6      2
0     2       1
444    47    1   2     130.0   253    0        1      179      0      0.0      2
0     2       1
445    52    1   1     128.0   205    1        1      184      0      0.0      2
0     2       1
446    53    1   2     130.0   246    1        0      173      0      0.0      2
3     2       1
447    55    1   0     160.0   289    0        0      145      1      0.8      1
1     3       0
448    51    0   2     120.0   295    0        0      157      0      0.6      2
449    52    1   0     112.0   230    0        1      160      0      0.0      2
1     2       0
450    63    0   0     150.0   407    0        0      154      0      4.0      1
3     3       0
451    49    0   1     134.0   271    0        1      162      0      0.0      1
0     2       1
452    66    0   0     178.0   228    1        1      165      1      1.0      1
2     3       0
453    49    0   1     134.0   271    0        1      162      0      0.0      1
0     2       1
454    65    0   0     150.0   225    0        0      114      0      1.0      1
3     3       0
455    69    1   3     160.0   234    1        0      131      0      0.1      1
1     2       1
456    47    1   2     108.0   243    0        1      152      0      0.0      2
0     2       0
457    39    0   2     138.0   220    0        1      152      0      0.0      1
```

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0     2       1
```

```
0     2       1
458    43    1   0     150.0   247    0        1      171      0      1.5      2
0     2       1
459    51    1   0     140.0   261    0        0      186      1      0.0      2
0     2       1
460    69    1   2     140.0   254    0        0      146      0      2.0      1
3     3       0
461    48    1   2     124.0   255    1        1      175      0      0.0      2
2     2       1
462    52    1   3     118.0   186    0        0      190      0      0.0      1
0     1       1
463    43    1   0     110.0   211    0        1      161      0      0.0      2
0     3       1
464    67    0   2     115.0   564    0        0      160      0      1.6      1
0     3       1
465    38    1   2     138.0   175    0        1      173      0      0.0      2
4     2       1
466    44    1   1     130.0   219    0        0      188      0      0.0      2
0     2       1
467    47    1   0     110.0   275    0        0      118      1      1.0      1
1     2       0
468    61    1   2     150.0   243    1        1      137      1      1.0      1
0     2       1
469    67    1   0     160.0   286    0        0      108      1      1.5      1
3     2       0
470    60    0   3     150.0   240    0        1      171      0      0.9      2
0     2       1
471    64    0   2     140.0   313    0        1      133      0      0.2      2
0     3       1
472    58    0   0     130.0   197    0        1      131      0      0.6      1
0     2       1
473    41    1   2     130.0   214    0        0      168      0      2.0      1
0     2       1
474    48    1   1     110.0   229    0        1      168      0      1.0      0
0     3       0
475    57    1   2     150.0   126    1        1      173      0      0.2      2
1     3       1
476    57    1   0     165.0   289    1        0      124      0      1.0      1
3     3       0
477    57    1   2     128.0   229    0        0      150      0      0.4      1
1     3       0
    478    39    1   2     140.0   321    0        0      182      0      0.0
          2
```

```
0     2       1
```

```
479    58    1   0     128.0   216    0        0      131      1      2.2      1
     3     3       0
     480    51    0   0     130.0   305    0        1      142      1      1.2      1
     0     3       0
     481    63    0   0     150.0   407    0        0      154      0      4.0      1
     3     3       0
     482    51    1   0     140.0   298    0        1      122      1      4.2      1
     3     3       0
     483    35    1   1     122.0   192    0        1      174      0      0.0      2
     0     2       1
     484    65    1   0     110.0   248    0        0      158      0      0.6      2
     2     1       0
     485    62    1   1     120.0   281    0        0      103      0      1.4      1
     1     3       0
     486    41    1   0     110.0   172    0        0      158      0      0.0      2
     0     3       0
     487    65    1   0     135.0   254    0        0      127      0      2.8      1
     1     3       0
     488    54    0   1     132.0   288    1        0      159      1      0.0      2
     1     2       1
     489    61    1   2     150.0   243    1        1      137      1      1.0      1
     0     2       1
     490    57    0   0     128.0   303    0        0      159      0      0.0      2
     1     2       1
     491    57    1   2     150.0   168    0        1      174      0      1.6      2
     0     2       1
     492    64    1   2     125.0   309    0        1      131      1      1.8      1
     0     3       0
     493    55    1   0     132.0   353    0        1      132      1      1.2      1
     1     3       0
     494    51    1   2     125.0   245    1        0      166      0      2.4      1
     0     2       1
     495    59    1   0     135.0   234    0        1      161      0      0.5      1
     0     3       1
     496    68    1   2     180.0   274    1        0      150      1      1.6      1
     0     3       0
     497    57    1   1     154.0   232    0        0      164      0      0.0      2
     1     2       0
     498    54    1   0     140.0   239    0        1      160      0      1.2      2
     0     2       1
     499    46    0   2     142.0   177    0        0      160      1      1.4      0
     0     2       1
     500    71    0   0     112.0   149    0        1      125      0      1.6      1
     0     2       1
```

```
501    35    0   0     138.0   183    0        1      182      0      1.4      2
0     2       1
502    46    0   2     142.0   177    0        0      160      1      1.4      0
0     2       1
503    45    0   1     130.0   234    0        0      175      0      0.6      1
0     2       1
504    47    1   2     108.0   243    0        1      152      0      0.0      2
0     2       0
505    44    0   2     118.0   242    0        1      149      0      0.3      1
1     2       1
506    61    1   0     120.0   260    0        1      140      1      3.6      1
1     3       0
507    41    0   1     130.0   204    0        0      172      0      1.4      2
0     2       1
508    56    0   0     200.0   288    1        0      133      1      4.0      0
2     3       0
509    55    0   0     180.0   327    0        2      117      1      3.4      1
0     2       0
510    54    0   1     132.0   288    1        0      159      1      0.0      2
1     2       1
511    43    1   0     120.0   177    0        0      120      1      2.5      1
0     3       0
512    44    1   0     112.0   290    0        0      153      0      0.0      2
1     2       0
513    54    1   0     110.0   206    0        0      108      1      0.0      1
1     2       0
514    44    1   1     120.0   220    0        1      170      0      0.0      2
0     2       1
515    49    1   2     120.0   188    0        1      139      0      2.0      1
3     3       0
516    60    1   0     130.0   206    0        0      132      1      2.4      1
2     3       0
517    41    0   1     105.0   198    0        1      168      0      0.0      2
1     2       1
518    49    1   2     120.0   188    0        1      139      0      2.0      1
3     3       0
519    61    1   0     148.0   203    0        1      161      0      0.0      2
1     3       0
520    59    1   0     140.0   177    0        1      162      1      0.0      2
1     3       0
521    58    1   1     125.0   220    0        1      144      0      0.4      1
4     3       1
522    67    0   2     152.0   277    0        1      172      0      0.0      2
1     2       1
```

```
523    61    1   0     148.0   203    0        1      161      0      0.0      2
1     3       0
524    58    1   2     112.0   230    0        0      165      0      2.5      1
1     3       0
525    51    0   2     130.0   256    0        0      149      0      0.5      2
0     2       1
526    62    0   0     160.0   164    0        0      145      0      6.2      0
3     3       0
527    62    0   0     124.0   209    0        1      163      0      0.0      2
0     2       1
528    59    1   3     178.0   270    0        0      145      0      4.2      0
0     3       1
529    69    1   3     160.0   234    1        0      131      0      0.1      1
1     2       1
530    60    0   0     150.0   258    0        0      157      0      2.6      1
2     3       0
531    65    0   2     155.0   269    0        1      148      0      0.8      2
0     2       1
532    63    0   0     124.0   197    0        1      136      1      0.0      1
0     2       0
533    53    0   0     138.0   234    0        0      160      0      0.0      2
0     2       1
534    54    0   2     108.0   267    0        0      167      0      0.0      2
0     2       1
535    76    0   2     140.0   197    0        2      116      0      1.1      1
0     2       1
536    50    0   2     120.0   219    0        1      158      0      1.6      1
0     2       1
537    52    1   1     120.0   325    0        1      172      0      0.2      2
0     2       1
538    46    1   0     120.0   249    0        0      144      0      0.8      2
0     3       0
539    64    1   3     170.0   227    0        0      155      0      0.6      1
0     3       1
540    58    1   0     128.0   259    0        0      130      1      3.0      1
2     3       0
541    44    1   2     140.0   235    0        0      180      0      0.0      2
0     2       1
542    62    0   0     140.0   394    0        0      157      0      1.2      1
0     2       1
543    59    1   3     134.0   204    0        1      162      0      0.8      2
2     2       0
544    54    1   2     125.0   273    0        0      152      0      0.5      0
1     2       1
```

```
545    48    1   1     110.0   229    0        1      168      0      1.0      0
0      3       0
546    70    1   0     130.0   322    0        0      109      0      2.4      1
3      2       0
547    67    0   0     106.0   223    0        1      142      0      0.3      2
2      2       1
548    51    0   2     120.0   295    0        0      157      0      0.6      2
0      2       1
549    68    1   2     118.0   277    0        1      151      0      1.0      2
1      3       1
550    69    1   2     140.0   254    0        0      146      0      2.0      1
3      3       0
551    54    1   0     122.0   286    0        0      116      1      3.2      1
2      2       0
552    43    0   0     132.0   341    1        0      136      1      3.0      1
0      3       0
553    53    1   2     130.0   197    1        0      152      0      1.2      0
0      2       1
554    58    1   0     100.0   234    0        1      156      0      0.1      2
1      3       0
555    67    1   0     125.0   254    1        1      163      0      0.2      1
2      3       0
556    59    1   0     140.0   177    0        1      162      1      0.0      2
1      3       0
557    48    1   0     122.0   222    0        0      186      0      0.0      2
0      2       1
558    39    0   2      94.0   199    0        1      179      0      0.0      2
0      2       1
559    67    1   0     120.0   237    0        1       71      0      1.0      1
0      2       0
560    58    0   0     130.0   197    0        1      131      0      0.6      1
0      2       1
561    65    0   2     155.0   269    0        1      148      0      0.8      2
0      2       1
562    42    0   2     120.0   209    0        1      173      0      0.0      1
0      2       1
563    44    1   0     112.0   290    0        0      153      0      0.0      2
1      2       0
564    56    1   0     132.0   184    0        0      105      1      2.1      1
1      1       0
565    53    0   0     138.0   234    0        0      160      0      0.0      2
0      2       1
566    50    0   0     110.0   254    0        0      159      0      0.0      2
0      2       1
```

```
567    41    1   2     130.0   214    0        0      168      0      2.0      1
0     2       1
568    54    0   2     160.0   201    0        1      163      0      0.0      2
1     2       1
569    42    1   2     120.0   240    1        1      194      0      0.8      0
0     3       1
570    54    0   2     135.0   304    1        1      170      0      0.0      2
0     2       1
571    60    1   0     145.0   282    0        0      142      1      2.8      1
2     3       0
572    34    1   3     118.0   182    0        0      174      0      0.0      2
0     2       1
573    44    1   0     112.0   290    0        0      153      0      0.0      2
1     2       0
574    60    1   0     125.0   258    0        0      141      1      2.8      1
1     3       0
575    43    1   0     150.0   247    0        1      171      0      1.5      2
0     2       1
576    52    1   3     152.0   298    1        1      178      0      1.2      1
0     3       1
577    70    1   0     130.0   322    0        0      109      0      2.4      1
3     2       0
578    62    0   0     140.0   394    0        0      157      0      1.2      1
0     2       1
579    58    1   0     146.0   218    0        1      105      0      2.0      1
1     3       0
580    46    1   1     101.0   197    1        1      156      0      0.0      2
0     3       1
581    44    1   2     140.0   235    0        0      180      0      0.0      2
0     2       1
582    55    1   1     130.0   262    0        1      155      0      0.0      2
0     2       1
583    43    1   0     120.0   177    0        0      120      1      2.5      1
0     3       0
584    55    1   0     132.0   353    0        1      132      1      1.2      1
1     3       0
585    40    1   3     140.0   199    0        1      178      1      1.4      2
0     3       1
586    64    1   2     125.0   309    0        1      131      1      1.8      1
0     3       0
587    59    1   0     164.0   176    1        0       90      0      1.0      1
2     1       0
588    61    0   0     145.0   307    0        0      146      1      1.0      1
0     3       0
```

```
589    54    1   0     122.0   286    0        0      116      1      3.2      1
2      2       0
590    74    0   1     120.0   269    0        0      121      1      0.2      2
1      2       1
591    63    0   0     108.0   269    0        1      169      1      1.8      1
2      2       0
592    70    1   2     160.0   269    0        1      112      1      2.9      1
1      3       0
593    63    0   0     108.0   269    0        1      169      1      1.8      1
2      2       0
594    64    1   0     145.0   212    0        0      132      0      2.0      1
2      1       0
595    61    1   0     148.0   203    0        1      161      0      0.0      2
1      3       0
596    59    1   1     140.0   221    0        1      164      1      0.0      2
0      2       1
597    38    1   2     138.0   175    0        1      173      0      0.0      2
4      2       1
598    58    1   1     120.0   284    0        0      160      0      1.8      1
0      2       0
599    63    0   1     140.0   195    0        1      179      0      0.0      2
2      2       1
600    62    0   2     130.0   263    0        1       97      0      1.2      1
1      3       0
601    46    1   0     140.0   311    0        1      120      1      1.8      1
2      3       0
602    58    0   2     120.0   340    0        1      172      0      0.0      2
0      2       1
603    63    0   1     140.0   195    0        1      179      0      0.0      2
2      2       1
604    47    1   2     130.0   253    0        1      179      0      0.0      2
0      2       1
605    71    0   2     110.0   265    1        0      130      0      0.0      2
1      2       1
606    66    1   0     112.0   212    0        0      132      1      0.1      2
1      2       0
607    42    1   0     136.0   315    0        1      125      1      1.8      1
0      1       0
608    64    1   0     145.0   212    0        0      132      0      2.0      1
2      1       0
609    55    0   0     180.0   327    0        2      117      1      3.4      1
0      2       0
610    43    0   0     132.0   341    1        0      136      1      3.0      1
0      3       0
```

```
611    55    0   0     128.0   205    0        2      130      1      2.0      1
1     3       0
612    58    0   0     170.0   225    1        0      146      1      2.8      1
2     1       0
613    55    1   0     140.0   217    0        1      111      1      5.6      0
0     3       0
614    51    0   0     130.0   305    0        1      142      1      1.2      1
0     3       0
615    50    0   2     120.0   219    0        1      158      0      1.6      1
0     2       1
616    43    1   0     115.0   303    0        1      181      0      1.2      1
0     2       1
617    41    0   1     126.0   306    0        1      163      0      0.0      2
0     2       1
618    49    1   1     130.0   266    0        1      171      0      0.6      2
0     2       1
619    65    1   0     110.0   248    0        0      158      0      0.6      2
2     1       0
620    57    1   0     152.0   274    0        1       88      1      1.2      1
1     3       0
621    48    1   0     130.0   256    1        0      150      1      0.0      2
2     3       0
622    62    0   0     138.0   294    1        1      106      0      1.9      1
3     2       0
623    61    1   3     134.0   234    0        1      145      0      2.6      1
2     2       0
624    59    1   3     178.0   270    0        0      145      0      4.2      0
0     3       1
625    69    1   2     140.0   254    0        0      146      0      2.0      1
3     3       0
626    58    1   2     132.0   224    0        0      173      0      3.2      2
2     3       0
627    38    1   3     120.0   231    0        1      182      1      3.8      1
0     3       0
628    69    0   3     140.0   239    0        1      151      0      1.8      2
2     2       1
629    65    1   3     138.0   282    1        0      174      0      1.4      1
1     2       0
630    45    1   3     110.0   264    0        1      132      0      1.2      1
0     3       0
631    49    1   1     130.0   266    0        1      171      0      0.6      2
0     2       1
632    45    0   1     130.0   234    0        0      175      0      0.6      1
0     2       1
```

```
633    61    1   0     138.0   166    0        0      125      1      3.6      1
1     2       0
634    52    1   0     125.0   212    0        1      168      0      1.0      2
2     3       0
635    53    0   0     130.0   264    0        0      143      0      0.4      1
0     2       1
636    59    0   0     174.0   249    0        1      143      1      0.0      1
0     2       0
637    58    0   2     120.0   340    0        1      172      0      0.0      2
0     2       1
638    65    1   3     138.0   282    1        0      174      0      1.4      1
1     2       0
639    58    0   0     130.0   197    0        1      131      0      0.6      1
0     2       1
640    46    0   0     138.0   243    0        0      152      1      0.0      1
0     2       1
641    56    0   0     134.0   409    0        0      150      1      1.9      1
2     3       0
642    64    1   0     128.0   263    0        1      105      1      0.2      1
1     3       1
643    65    1   0     120.0   177    0        1      140      0      0.4      2
0     3       1
644    44    1   2     120.0   226    0        1      169      0      0.0      2
0     2       1
645    50    1   0     150.0   243    0        0      128      0      2.6      1
0     3       0
646    47    1   2     108.0   243    0        1      152      0      0.0      2
0     2       0
647    64    0   0     130.0   303    0        1      122      0      2.0      1
2     2       1
648    71    0   0     112.0   149    0        1      125      0      1.6      1
0     2       1
649    45    0   1     130.0   234    0        0      175      0      0.6      1
0     2       1
650    62    1   0     120.0   267    0        1       99      1      1.8      1
2     3       0
651    41    1   1     120.0   157    0        1      182      0      0.0      2
0     2       1
652    66    0   3     150.0   226    0        1      114      0      2.6      0
0     2       1
653    56    1   0     130.0   283    1        0      103      1      1.6      0
0     3       0
654    41    0   1     126.0   306    0        1      163      0      0.0      2
0     2       1
```

```
655    41    1   1     110.0   235    0        1      153      0      0.0      2
0     2       1
656    57    0   1     130.0   236    0        0      174      0      0.0      1
1     2       0
657    39    0   2     138.0   220    0        1      152      0      0.0      1
0     2       1
658    64    1   2     125.0   309    0        1      131      1      1.8      1
0     3       0
659    59    1   0     138.0   271    0        0      182      0      0.0      2
0     2       1
660    61    1   0     138.0   166    0        0      125      1      3.6      1 1
       2       0
661    58    1   0     114.0   318    0        2      140      0      4.4      0
3     1       0
662    47    1   0     112.0   204    0        1      143      0      0.1      2
0     2       1
663    58    0   0     100.0   248    0        0      122      0      1.0      1
0     2       1
664    66    0   3     150.0   226    0        1      114      0      2.6      0
0     2       1
665    65    0   2     140.0   417    1        0      157      0      0.8      2
1     2       1
666    35    1   1     122.0   192    0        1      174      0      0.0      2
0     2       1
667    57    1   1     124.0   261    0        1      141      0      0.3      2
0     3       0
668    29    1   1     130.0   204    0        0      202      0      0.0      2
0     2       1
669    66    1   1     160.0   246    0        1      120      1      0.0      1
3     1       0
670    61    0   0     130.0   330    0        0      169      0      0.0      2
0     2       0
671    52    1   0     125.0   212    0        1      168      0      1.0      2
2     3       0
672    68    1   2     118.0   277    0        1      151      0      1.0      2
1     3       1
673    54    1   2     120.0   258    0        0      147      0      0.4      1
0     3       1
674    63    1   0     130.0   330    1        0      132      1      1.8      2
3     3       0
675    58    1   0     100.0   234    0        1      156      0      0.1      2
1     3       0
676    60    1   0     130.0   253    0        1      144      1      1.4      2
1     3       0
```

```
677    63    1   0     130.0   254    0        0      147      0      1.4      1
1     3       0
678    41    0   2     112.0   268    0        0      172      1      0.0      2
0     2       1
679    68    1   2     180.0   274    1        0      150      1      1.6      1
0     3       0
680    42    1   1     120.0   295    0        1      162      0      0.0      2
0     2       1
681    59    1   0     170.0   326    0        0      140      1      3.4      0
0     3       0
682    59    1   0     164.0   176    1        0       90      0      1.0      1
2     1       0
683    43    1   0     120.0   177    0        0      120      1      2.5      1
0     3       0
684    60    1   2     140.0   185    0        0      155      0      3.0      1
0     2       0
685    63    0   0     150.0   407    0        0      154      0      4.0      1
3     3       0
686    52    1   0     128.0   204    1        1      156      1      1.0      1
0     0       0
687    58    1   0     125.0   300    0        0      171      0      0.0      2
2     3       0
688    56    0   0     200.0   288    1        0      133      1      4.0      0
2     3       0
689    54    0   2     135.0   304    1        1      170      0      0.0      2
0     2       1
690    58    1   2     105.0   240    0        0      154      1      0.6      1
0     3       1
691    55    0   1     135.0   250    0        0      161      0      1.4      1
0     2       1
692    53    1   0     140.0   203    1        0      155      1      3.1      0
0     3       0
693    63    0   1     140.0   195    0        1      179      0      0.0      2
2     2       1
694    39    1   0     118.0   219    0        1      140      0      1.2      1
0     3       0
695    35    1   0     126.0   282    0        0      156      1      0.0      2
0     3       0
696    50    0   2     120.0   219    0        1      158      0      1.6      1
0     2       1
697    67    1   2     152.0   212    0        0      150      0      0.8      1
0     3       0
698    66    1   0     112.0   212    0        0      132      1      0.1      2
1     2       0
```

```
699    35    1   0     126.0   282    0        0      156      1      0.0      2
0     3       0
700    41    1   2     130.0   214    0        0      168      0      2.0      1
0     2       1
701    35    1   0     120.0   198    0        1      130      1      1.6      1
0     3       0
702    71    0   1     160.0   302    0        1      162      0      0.4      2
2     2       1
703    57    1   0     110.0   201    0        1      126      1      1.5      1
0     1       1
704    51    1   2      94.0   227    0        1      154      1      0.0      2
1     3       1
705    58    1   0     128.0   216    0        0      131      1      2.2      1
3     3       0
706    57    1   2     128.0   229    0        0      150      0      0.4      1
1     3       0
707    56    0   1     140.0   294    0        0      153      0      1.3      1
0     2       1
708    60    0   2     120.0   178    1        1       96      0      0.0      2
0     2       1
709    45    1   3     110.0   264    0        1      132      0      1.2      1
0     3       0
710    56    1   1     130.0   221    0        0      163      0      0.0      2
0     3       1
711    35    1   0     120.0   198    0        1      130      1      1.6      1
0     3       0
712    45    0   1     112.0   160    0        1      138      0      0.0      1
0     2       1
713    66    0   3     150.0   226    0        1      114      0      2.6      0
0     2       1
714    51    1   3     125.0   213    0        0      125      1      1.4      2
1     2       1
715    70    1   1     156.0   245    0        0      143      0      0.0      2
0     2       1
716    55    0   0     128.0   205    0        2      130      1      2.0      1
1     3       0
717    56    1   2     130.0   256    1        0      142      1      0.6      1
1     1       0
718    55    0   1     135.0   250    0        0      161      0      1.4      1
0     2       1
719    52    1   0     108.0   233    1        1      147      0      0.1      2
3     3       1
720    64    1   2     140.0   335    0        1      158      0      0.0      2
0     2       0
```

```
721   45   1   0    115.0   260   0       0      185      0      0.0      2
0     2      1
722   67   0   2    152.0   277   0       1      172      0      0.0      2
1     2      1
723   68   0   2    120.0   211   0       0      115      0      1.5      1
0     2      1
724   74   0   1    120.0   269   0       0      121      1      0.2      2
1     2      1
725   60   0   0    150.0   258   0       0      157      0      2.6      1
2     3      0
726   48   1   0    124.0   274   0       0      166      0      0.5      1
0     3      0
727   56   1   1    130.0   221   0       0      163      0      0.0      2
0     3      1
728   46   1   0    140.0   311   0       1      120      1      1.8      1
2     3      0
729   55   0   1    135.0   250   0       0      161      0      1.4      1
0     2      1
730   44   1   1    120.0   220   0       1      170      0      0.0      2
0     2      1
731   52   1   0    112.0   230   0       1      160      0      0.0      2
1     2      0
732   51   1   2     94.0   227   0       1      154      1      0.0      2
1     3      1
733   44   0   2    108.0   141   0       1      175      0      0.6      1
0     2      1
734   52   1   0    128.0   204   1       1      156      1      1.0      1
0     0      0
735   50   1   2    129.0   196   0       1      163      0      0.0      2
0     2      1
736   59   1   0    110.0   239   0       0      142      1      1.2      1
1     3      0
737   67   1   0    120.0   229   0       0      129      1      2.6      1
2     3      0
738   58   1   0    125.0   300   0       0      171      0      0.0      2
2     3      0
739   52   1   0    128.0   255   0       1      161      1      0.0      2
1     3      0
740   44   1   2    140.0   235   0       0      180      0      0.0      2
0     2      1
741   41   0   2    112.0   268   0       0      172      1      0.0      2
0     2      1
742   63   1   0    130.0   330   1       0      132      1      1.8      2
3     3      0
```

```
743    58    1   1     125.0   220    0        1      144      0      0.4      1
4     3       1
744    60    0   2     102.0   318    0        1      160      0      0.0      2
1     2       1
745    51    1   2     100.0   222    0        1      143      1      1.2      1
0     2       1
746    64    1   2     140.0   335    0        1      158      0      0.0      2
0     2       0
747    60    1   0     117.0   230    1        1      160      1      1.4      2
2     3       0
748    44    1   2     120.0   226    0        1      169      0      0.0      2
0     2       1
749    58    1   1     125.0   220    0        1      144      0      0.4      1
4     3       1
750    55    1   1     130.0   262    0        1      155      0      0.0      2
0     2       1
751    65    0   2     160.0   360    0        0      151      0      0.8      2
0     2       1
752    48    1   1     130.0   245    0        0      180      0      0.2      1
0     2       1
753    65    1   0     120.0   177    0        1      140      0      0.4      2
0     3       1
754    51    0   2     130.0   256    0        0      149      0      0.5      2
0     2       1
755    48    1   2     124.0   255    1        1      175      0      0.0      2
2     2       1
756    64    1   0     120.0   246    0        0       96      1      2.2      0
1     2       0
757    66    1   0     160.0   228    0        0      138      0      2.3      2
0     1       1
758    46    0   1     105.0   204    0        1      172      0      0.0      2
0     2       1
759    61    0   0     130.0   330    0        0      169      0      0.0      2
0     2       0
760    57    1   0     150.0   276    0        0      112      1      0.6      1
1     1       0
761    49    0   0     130.0   269    0        1      163      0      0.0      2
0     2       1
762    56    1   1     130.0   221    0        0      163      0      0.0      2
0     3       1
763    58    0   3     150.0   283    1        0      162      0      1.0      2
0     2       1
764    63    1   0     140.0   187    0        0      144      1      4.0      2
2     3       0
```

```
765    57    1   0     110.0   335    0        1      143      1      3.0      1
1      3       0
766    57    1   0     110.0   335    0        1      143      1      3.0      1
1      3       0
767    68    1   0     144.0   193    1        1      141      0      3.4      1
2      3       0
768    46    1   1     101.0   197    1        1      156      0      0.0      2
0      3       1
769    71    0   2     110.0   265    1        0      130      0      0.0      2
1      2       1
770    41    1   1     135.0   203    0        1      132      0      0.0      1
0      1       1
771    45    0   0     138.0   236    0        0      152      1      0.2      1
0      2       1
772    62    0   0     150.0   244    0        1      154      1      1.4      1
0      2       0
773    65    0   0     150.0   225    0        0      114      0      1.0      1
3      3       0
774    48    0   2     130.0   275    0        1      139      0      0.2      2
0      2       1
775    51    1   2     100.0   222    0        1      143      1      1.2      1
0      2       1
776    61    0   0     145.0   307    0        0      146      1      1.0      1
0      3       0
777    53    1   0     123.0   282    0        1       95      1      2.0      1
2      3       0
778    59    1   3     134.0   204    0        1      162      0      0.8      2
2      2       0
779    34    0   1     118.0   210    0        1      192      0      0.7      2
0      2       1
780    44    1   0     120.0   169    0        1      144      1      2.8      0
0      1       0
781    58    1   0     146.0   218    0        1      105      0      2.0      1
1      3       0
782    64    0   0     130.0   303    0        1      122      0      2.0      1
2      2       1
783    56    1   1     120.0   240    0        1      169      0      0.0      0
0      2       1
784    54    1   2     150.0   232    0        0      165      0      1.6      2
0      3       1
785    55    1   0     160.0   289    0        0      145      1      0.8      1
1      3       0
786    67    1   0     125.0   254    1        1      163      0      0.2      1
2      3       0
```

```
787    51    1   0     140.0   298    0        1      122      1      4.2      1
3      3       0
788    62    0   0     138.0   294    1        1      106      0      1.9      1
3      2       0
789    62    1   1     120.0   281    0        0      103      0      1.4      1
1      3       0
790    54    1   0     110.0   239    0        1      126      1      2.8      1
1      3       0
791    54    1   0     110.0   239    0        1      126      1      2.8      1
1      3       0
792    68    1   0     144.0   193    1        1      141      0      3.4      1
2      3       0
793    60    0   2     120.0   178    1        1       96      0      0.0      2
0      2       1
794    61    1   3     134.0   234    0        1      145      0      2.6      1
2      2       0
795    62    1   1     128.0   208    1        0      140      0      0.0      2
0      2       1
796    41    1   1     135.0   203    0        1      132      0      0.0      1
0      1       1
797    65    0   0     150.0   225    0        0      114      0      1.0      1
3      3       0
798    59    1   3     170.0   288    0        0      159      0      0.2      1
0      3       0
799    43    1   0     115.0   303    0        1      181      0      1.2      1
0      2       1
800    67    1   0     120.0   229    0        0      129      1      2.6      1
2      3       0
801    63    1   3     145.0   233    1        0      150      0      2.3      0
0      1       1
802    63    0   0     124.0   197    0        1      136      1      0.0      1
0      2       0
803    52    1   0     112.0   230    0        1      160      0      0.0      2
1      2       0
804    58    0   0     130.0   197    0        1      131      0      0.6      1
0      2       1
805    53    1   0     142.0   226    0        0      111      1      0.0      2
0      3       1
806    57    1   0     150.0   276    0        0      112      1      0.6      1
1      1       0
807    44    1   2     130.0   233    0        1      179      1      0.4      2
0      2       1
808    51    1   2      94.0   227    0        1      154      1      0.0      2
1      3       1
```

```
809    54    0   2     110.0   214    0        1      158      0      1.6      1
0     2       1
810    40    1   0     110.0   167    0        0      114      1      2.0      1
0     3       0
811    57    1   1     124.0   261    0        1      141      0      0.3      2
0     3       0
812    62    0   0     140.0   268    0        0      160      0      3.6      0
2     2       0
813    53    1   0     140.0   203    1        0      155      1      3.1      0
0     3       0
814    62    1   1     128.0   208    1        0      140      0      0.0      2
0     2       1
815    58    1   2     105.0   240    0        0      154      1      0.6      1
0     3       1
816    70    1   1     156.0   245    0        0      143      0      0.0      2
0     2       1
817    45    1   0     115.0   260    0        0      185      0      0.0      2
0     2       1
818    42    1   3     148.0   244    0        0      178      0      0.8      2
2     2       1
819    58    0   0     170.0   225    1        0      146      1      2.8      1
2     1       0
820    61    1   0     140.0   207    0        0      138      1      1.9      2
1     3       0
821    62    0   0     140.0   268    0        0      160      0      3.6      0
2     2       0
822    60    1   0     130.0   253    0        1      144      1      1.4      2
1     3       0
823    54    1   0     140.0   239    0        1      160      0      1.2      2
0     2       1
824    61    1   0     138.0   166    0        0      125      1      3.6      1
1     2       0
825    63    0   2     135.0   252    0        0      172      0      0.0      2
0     2       1
826    42    1   2     130.0   180    0        1      150      0      0.0      2
0     2       1
827    57    1   2     128.0   229    0        0      150      0      0.4      1
1     3       0
828    44    1   2     130.0   233    0        1      179      1      0.4      2
0     2       1
829    54    1   0     124.0   266    0        0      109      1      2.2      1
1     3       0
830    51    1   2     100.0   222    0        1      143      1      1.2      1
0     2       1
```

```
831    58    1   1     125.0   220    0        1      144      0      0.4      1
4     3       1
832    68    1   2     118.0   277    0        1      151      0      1.0      2
1     3       1
833    55    1   0     140.0   217    0        1      111      1      5.6      0
0     3       0
834    42    1   0     136.0   315    0        1      125      1      1.8      1
0     1       0
835    49    1   2     118.0   149    0        0      126      0      0.8      2
3     2       0
836    53    0   0     138.0   234    0        0      160      0      0.0      2
0     2       1
837    52    1   2     172.0   199    1        1      162      0      0.5      2
0     3       1
838    51    1   3     125.0   213    0        0      125      1      1.4      2
1     2       1
839    51    1   0     140.0   261    0        0      186      1      0.0      2
0     2       1
840    70    1   0     145.0   174    0        1      125      1      2.6      0
0     3       0
841    35    0   0     138.0   183    0        1      182      0      1.4      2
0     2       1
842    58    1   2     112.0   230    0        0      165      0      2.5      1
1     3       0
843    59    1   3     160.0   273    0        0      125      0      0.0      2
0     2       0
844    60    1   0     140.0   293    0        0      170      0      1.2      1
2     3       0
845    56    1   0     132.0   184    0        0      105      1      2.1      1
1     1       0
846    35    0   0     138.0   183    0        1      182      0      1.4      2
0     2       1
847    61    1   0     138.0   166    0        0      125      1      3.6      1
1     2       0
848    58    0   3     150.0   283    1        0      162      0      1.0      2
0     2       1
849    52    1   0     128.0   255    0        1      161      1      0.0      2
1     3       0
850    58    1   1     120.0   284    0        0      160      0      1.8      1
0     2       0
851    37    1   2     130.0   250    0        1      187      0      3.5      0
0     2       1
852    52    1   0     128.0   255    0        1      161      1      0.0      2
1     3       0
```

```
853    67    1   0     120.0   229    0        0      129      1      2.6      1
2      3      0
854    65    1   3     138.0   282    1        0      174      0      1.4      1
1      2      0
855    46    1   1     101.0   197    1        1      156      0      0.0      2
0      3      1
856    68    0   2     120.0   211    0        0      115      0      1.5      1
0      2      1
857    43    1   0     115.0   303    0        1      181      0      1.2      1
0      2      1
858    68    0   2     120.0   211    0        0      115      0      1.5      1
0      2      1
859    51    1   0     140.0   299    0        1      173      1      1.6      2
0      3      0
860    52    1   0     112.0   230    0        1      160      0      0.0      2
1      2      0
861    64    1   2     140.0   335    0        1      158      0      0.0      2
0      2      0
862    59    1   3     170.0   288    0        0      159      0      0.2      1
0      3      0
863    52    1   0     125.0   212    0        1      168      0      1.0      2
2      3      0
864    59    1   3     160.0   273    0        0      125      0      0.0      2
0      2      0
865    60    0   3     150.0   240    0        1      171      0      0.9      2
0      2      1
866    41    1   2     112.0   250    0        1      179      0      0.0      2
0      2      1
867    41    1   1     110.0   235    0        1      153      0      0.0      2
0      2      1
868    56    1   1     120.0   240    0        1      169      0      0.0      0
0      2      1
869    56    1   1     120.0   236    0        1      178      0      0.8      2
0      2      1
870    48    0   2     130.0   275    0        1      139      0      0.2      2
0      2      1
871    39    1   2     140.0   321    0        0      182      0      0.0      2
0      2      1
872    64    1   3     170.0   227    0        0      155      0      0.6      1
0      3      1
873    57    1   0     140.0   192    0        1      148      0      0.4      1
0      1      1
874    59    1   3     160.0   273    0        0      125      0      0.0      2
0      2      0
```

```
875    60    1   0     130.0   206    0        0      132      1      2.4      1
2      3       0
876    61    1   0     140.0   207    0        0      138      1      1.9      2
1      3       0
877    43    0   2     122.0   213    0        1      165      0      0.2      1
0      2       1
878    54    1   0     120.0   188    0        1      113      0      1.4      1
1      3       0
879    59    1   0     138.0   271    0        0      182      0      0.0      2
0      2       1
880    57    1   0     132.0   207    0        1      168      1      0.0      2
0      3       1
881    57    1   1     154.0   232    0        0      164      0      0.0      2
1      2       0
882    57    1   0     130.0   131    0        1      115      1      1.2      1
1      3       0
883    48    1   0     124.0   274    0        0      166      0      0.5      1
0      3       0
884    70    1   0     145.0   174    0        1      125      1      2.6      0
0      3       0
885    57    1   0     165.0   289    1        0      124      0      1.0      1
3      3       0
886    61    1   0     120.0   260    0        1      140      1      3.6      1
1      3       0
887    57    1   0     110.0   201    0        1      126      1      1.5      1
0      1       1
888    60    0   0     150.0   258    0        0      157      0      2.6      1
2      3       0
889    63    0   0     150.0   407    0        0      154      0      4.0      1
3      3       0
890    55    0   0     128.0   205    0        2      130      1      2.0      1
1      3       0
891    64    0   0     180.0   325    0        1      154      1      0.0      2
0      2       1
892    54    1   0     110.0   239    0        1      126      1      2.8      1
1      3       0
893    52    1   0     128.0   204    1        1      156      1      1.0      1
0      0       0
894    51    1   0     140.0   299    0        1      173      1      1.6      2
0      3       0
895    62    0   2     130.0   263    0        1       97      0      1.2      1
1      3       0
896    59    1   3     178.0   270    0        0      145      0      4.2      0
0      3       1
```

```
897    52    1   1     134.0   201    0        1      158      0      0.8      2
1     2       1
898    42    0   0     102.0   265    0        0      122      0      0.6      1
0     2       1
899    59    1   0     135.0   234    0        1      161      0      0.5      1
0     3       1
900    61    1   3     134.0   234    0        1      145      0      2.6      1
2     2       0
901    42    0   0     102.0   265    0        0      122      0      0.6      1
0     2       1
902    62    0   0     140.0   268    0        0      160      0      3.6      0
2     2       0
903    59    1   2     126.0   218    1        1      134      0      2.2      1
1     1       0
904    55    1   1     130.0   262    0        1      155      0      0.0      2
0     2       1
905    64    1   0     120.0   246    0        0       96      1      2.2      0
1     2       0
906    42    1   0     140.0   226    0        1      178      0      0.0      2
0     2       1
907    50    0   1     120.0   244    0        1      162      0      1.1      2
0     2       1
908    62    1   0     120.0   267    0        1       99      1      1.8      1
2     3       0
909    50    1   0     144.0   200    0        0      126      1      0.9      1
0     3       0
910    50    1   2     140.0   233    0        1      163      0      0.6      1
1     3       0
911    58    0   1     136.0   319    1        0      152      0      0.0      2
2     2       0
912    35    1   0     120.0   198    0        1      130      1      1.6      1
0     3       0
913    45    1   0     104.0   208    0        0      148      1      3.0      1
0     2       1
914    66    1   0     112.0   212    0        0      132      1      0.1      2
1     2       0
915    46    1   0     120.0   249    0        0      144      0      0.8      2
0     3       0
916    65    1   0     135.0   254    0        0      127      0      2.8      1
1     3       0
917    47    1   2     130.0   253    0        1      179      0      0.0      2
0     2       1
918    59    1   3     134.0   204    0        1      162      0      0.8      2
2     2       0
```

```
919    38    1   3    120.0   231    0        1      182      1      3.8      1
0     3       0
920    39    1   0    118.0   219    0        1      140      0      1.2      1
0     3       0
921    58    1   0    146.0   218    0        1      105      0      2.0      1
1     3       0
922    44    1   1    120.0   263    0        1      173      0      0.0      2
0     3       1
923    54    1   0    140.0   239    0        1      160      0      1.2      2
0     2       1
924    61    0   0    130.0   330    0        0      169      0      0.0      2
0     2       0
925    57    1   0    130.0   131    0        1      115      1      1.2      1
1     3       0
926    54    1   0    110.0   206    0        0      108      1      0.0      1
1     2       0
927    42    1   2    120.0   240    1        1      194      0      0.8      0
0     3       1
928    54    1   0    124.0   266    0        0      109      1      2.2      1
1     3       0
929    60    1   0    130.0   206    0        0      132      1      2.4      1
2     3       0
930    65    1   0    135.0   254    0        0      127      0      2.8      1
1     3       0
931    40    1   0    152.0   223    0        1      181      0      0.0      2
0     3       0
932    51    0   2    140.0   308    0        0      142      0      1.5      2
1     2       1
933    38    1   3    120.0   231    0        1      182      1      3.8      1
0     3       0
934    42    1   2    130.0   180    0        1      150      0      0.0      2
0     2       1
935    56    1   1    120.0   240    0        1      169      0      0.0      0
0     2       1
936    43    1   2    130.0   315    0        1      162      0      1.9      2
1     2       1
937    64    1   2    140.0   335    0        1      158      0      0.0      2
0     2       0
938    53    1   0    142.0   226    0        0      111      1      0.0      2
0     3       1
939    49    0   1    134.0   271    0        1      162      0      0.0      1
0     2       1
940    57    0   0    140.0   241    0        1      123      1      0.2      1
0     3       0
```

```
941    52    0   2     136.0   196    0        0      169      0      0.1      1
0     2       1
942    69    0   3     140.0   239    0        1      151      0      1.8      2
2     2       1
943    65    1   0     120.0   177    0        1      140      0      0.4      2
0     3       1
944    66    0   0     178.0   228    1        1      165      1      1.0      1
2     3       0
945    56    1   3     120.0   193    0        0      162      0      1.9      1
0     3       1
946    67    0   2     152.0   277    0        1      172      0      0.0      2
1     2       1
947    54    0   2     160.0   201    0        1      163      0      0.0      2
1     2       1
948    70    1   0     145.0   174    0        1      125      1      2.6      0
0     3       0
949    57    1   0     132.0   207    0        1      168      1      0.0      2
0     3       1
950    67    1   0     160.0   286    0        0      108      1      1.5      1
3     2       0
951    62    0   2     130.0   263    0        1       97      0      1.2      1
1     3       0
952    54    0   2     135.0   304    1        1      170      0      0.0      2
0     2       1
953    45    0   0     138.0   236    0        0      152      1      0.2      1
0     2       1
954    53    0   0     130.0   264    0        0      143      0      0.4      1
0     2       1
955    62    1   2     130.0   231    0        1      146      0      1.8      1
3     3       1
956    49    0   0     130.0   269    0        1      163      0      0.0      2
0     2       1
957    50    1   2     140.0   233    0        1      163      0      0.6      1
1     3       0
958    65    0   2     140.0   417    1        0      157      0      0.8      2
1     2       1
959    69    0   3     140.0   239    0        1      151      0      1.8      2
2     2       1
960    52    0   2     136.0   196    0        0      169      0      0.1      1
0     2       1
961    58    0   0     100.0   248    0        0      122      0      1.0      1
0     2       1
962    52    1   0     108.0   233    1        1      147      0      0.1      2
3     3       1
```

```
963    57    0   0     140.0   241    0        1      123      1      0.2      1
0     3       0
964    44    0   2     108.0   141    0        1      175      0      0.6      1
0     2       1
965    76    0   2     140.0   197    0        2      116      0      1.1      1
0     2       1
966    58    1   0     128.0   259    0        0      130      1      3.0      1
2     3       0
967    60    0   2     120.0   178    1        1       96      0      0.0      2
0     2       1
968    53    1   0     140.0   203    1        0      155      1      3.1      0
0     3       0
969    52    1   1     120.0   325    0        1      172      0      0.2      2
0     2       1
970    38    1   2     138.0   175    0        1      173      0      0.0      2
4     2       1
971    52    1   2     172.0   199    1        1      162      0      0.5      2
0     3       1
972    52    1   3     118.0   186    0        0      190      0      0.0      1
0     1       1
973    51    1   2     125.0   245    1        0      166      0      2.4      1
0     2       1
974    43    1   0     110.0   211    0        1      161      0      0.0      2
0     3       1
975    39    1   0     118.0   219    0        1      140      0      1.2      1
0     3       0
976    63    0   0     108.0   269    0        1      169      1      1.8      1
2     2       0
977    52    1   1     128.0   205    1        1      184      0      0.0      2
0     2       1
978    44    1   0     110.0   197    0        0      177      0      0.0      2
1     2       0
979    45    1   0     142.0   309    0        0      147      1      0.0      1
3     3       0
980    57    1   0     140.0   192    0        1      148      0      0.4      1
0     1       1
981    39    1   0     118.0   219    0        1      140      0      1.2      1
0     3       0
982    67    0   0     106.0   223    0        1      142      0      0.3      2
2     2       1
983    64    1   0     128.0   263    0        1      105      1      0.2      1
1     3       1
984    59    1   0     135.0   234    0        1      161      0      0.5      1
0     3       1
```

```
985    62    1   2     130.0   231    0        1       146      0       1.8      1
3      3       1
986    55    0   0     180.0   327    0        2       117      1       3.4      1
0      2       0
987    57    1   1     154.0   232    0        0       164      0       0.0      2
1      2       0
988    60    1   0     140.0   293    0        0       170      0       1.2      1
2      3       0
989    71    0   1     160.0   302    0        1       162      0       0.4      2
2      2       1
990    56    1   1     120.0   236    0        1       178      0       0.8      2
0      2       1
991    60    1   0     117.0   230    1        1       160      1       1.4      2
2      3       0
992    50    0   0     110.0   254    0        0       159      0       0.0      2
0      2       1
993    43    1   0     132.0   247    1        0       143      1       0.1      1
4      3       0
994    59    1   0     110.0   239    0        0       142      1       1.2      1
1      3       0
995    44    1   1     120.0   263    0        1       173      0       0.0      2
0      3       1
996    56    0   0     134.0   409    0        0       150      1       1.9      1
2      3       0
997    54    1   0     120.0   188    0        1       113      0       1.4      1
1      3       0
998    42    1   0     136.0   315    0        1       125      1       1.8      1
0      1       0
999    67    1   0     125.0   254    1        1       163      0       0.2      1
2      3       0
1000   64    1   0     145.0   212    0        0       132      0       2.0      1
2      1       0
1001   42    1   0     140.0   226    0        1       178      0       0.0      2
0      2       1
1002   66    1   0     112.0   212    0        0       132      1       0.1      2
1      2       0
1003   52    1   0     108.0   233    1        1       147      0       0.1      2
3      3       1
1004   51    0   2     140.0   308    0        0       142      0       1.5      2
1      2       1
1005   55    0   0     128.0   205    0        2       130      1       2.0      1
1      3       0
1006   58    1   2     140.0   211    1        0       165      0       0.0      2
0      2       1
```

```
1007   56    1   3     120.0   193    0        0      162      0      1.9      1
0     3       1
1008   42    1   1     120.0   295    0        1      162      0      0.0      2
0     2       1
1009   40    1   0     152.0   223    0        1      181      0      0.0      2
0     3       0
1010   51    1   0     140.0   299    0        1      173      1      1.6      2
0     3       0
1011   45    1   1     128.0   308    0        0      170      0      0.0      2
0     2       1
1012   48    1   1     110.0   229    0        1      168      0      1.0      0
0     3       0
1013   58    1   0     114.0   318    0        2      140      0      4.4      0
3     1       0
1014   44    0   2     108.0   141    0        1      175      0      0.6      1
0     2       1
1015   58    1   0     128.0   216    0        0      131      1      2.2      1
3     3       0
1016   65    1   3     138.0   282    1        0      174      0      1.4      1
1     2       0
1017   53    1   0     123.0   282    0        1       95      1      2.0      1
2     3       0
1018   41    1   0     110.0   172    0        0      158      0      0.0      2
0     3       0
1019   47    1   0     112.0   204    0        1      143      0      0.1      2
0     2       1
1020   59    1   1     140.0   221    0        1      164      1      0.0      2
0     2       1
1021   60    1   0     125.0   258    0        0      141      1      2.8      1
1     3       0
1022   47    1   0     110.0   275    0        0      118      1      1.0      1
1     2       0
1023   50    0   0     110.0   254    0        0      159      0      0.0      2
0     2       1
1024   54    1   0     120.0   188    0        1      113      0      1.4      1
1     3       0 In
```

[11]:
```
df.head()
```

Out[11]:

	age	sexcp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal

0	52	1	0	125.0	212	0	1	168	0	1.0	2	2	3
1	52	1	0	125.0	87	0	1	168	0	1.0	2	2	3
2	70	1	0	145.0	174	0	1	125	1	2.6	0	0	3
3	61	1	0	148.0	203	0	1	161	0	0.0	2	1	3
4	62	0	0	138.0	294	1	1	106	0	1.9	1	3	2

In [13]:
```
df.head(7)
```

Out[13]:

	age	sexcp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal
0	52	1	0	125.0	212	0	1	168	0	1.0	2	2	3
1	52	1	0	125.0	87	0	1	168	0	1.0	2	2	3
2	70	1	0	145.0	174	0	1	125	1	2.6	0	0	3
3	61	1	0	148.0	203	0	1	161	0	0.0	2	1	3
4	62	0	0	138.0	294	1	1	106	0	1.9	1	3	2
5	58	0	0	100.0	248	0	0	122	0	1.0	1	0	2
6	58	1	0	NaN	318	0	2	140	0	4.4	0	3	1

In [15]:
```
df.tail()
```

Out[15]:

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca
1020	59	1	1	140.0	221	0	1	164	1	0.0	2	0
1021	60	1	0	125.0	258	0	0	141	1	2.8	1	1
1022	47	1	0	110.0	275	0	0	118	1	1.0	1	1
1023	50	0	0	110.0	254	0	0	159	0	0.0	2	0
1024	54	1	0	120.0	188	0	1	113	0	1.4	1	1

In [17]:
```
df.tail(3)
```

Out[17]:

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca
1022	47	1	0	110.0	275	0	0	118	1	1.0	1	1
1023	50	0	0	110.0	254	0	0	159	0	0.0	2	0
1024	54	1	0	120.0	188	0	1	113	0	1.4	1	1

In [19]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1025 entries, 0 to 1024 Data
columns (total 14 columns):
```

```
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
0   age        1025 non-null   int64
1   sex        1025 non-null   int64
2   cp         1025 non-null   int64
3   trestbps   1024 non-null   float64
4   chol       1025 non-null   int64
5   fbs        1025 non-null   int64
6   restecg    1025 non-null   int64
7   thalach    1025 non-null   int64
8   exang      1025 non-null   int64
9   oldpeak    1025 non-null   float64
10  slope      1025 non-null   int64
11  ca         1025 non-null   int64
12  thal       1025 non-null   int64   13  target     1025 non-null   int64   dtypes:
    float64(2), int64(12) memory usage: 112.2 KB
```

In [21]:
```
df.describe()
```

Out[21]:

	age	sex	cp	trestbps	chol	fbs	1
count	1025.000000	1025.000000	1025.000000	1024.000000	1025.000000	1025.000000	
mean	54.433171	0.695610	0.942439	131.614258	245.886829	0.148293	
std	9.072498	0.460373	1.029641	17.515881	51.813677	0.355563	
min	29.000000	0.000000	0.000000	94.000000	87.000000	0.000000	
25%	48.000000	0.000000	0.000000	120.000000	211.000000	0.000000	
50%	56.000000	1.000000	1.000000	130.000000	240.000000	0.000000	
75%	61.000000	1.000000	2.000000	140.000000	275.000000	0.000000	
max	77.000000	1.000000	3.000000	200.000000	564.000000	1.000000	

In [23]:
```
df.dtypes
```

Out[23]:
```
age           int64
sex           int64
cp            int64
trestbps    float64
chol          int64
fbs           int64
restecg       int64
thalach       int64
exang         int64
oldpeak     float64
slope         int64
ca            int64
thal          int64
target        int64
dtype: object
```

In [25]:
```
df['age'].mean()
```

Out[25]:
```
54.433170731707314
```

In [27]:
```
df['chol'].median()
```

Out[27]:
```
240.0
```

In [29]:
```
df['trestbps'].min()
```

Out[29]:
```
94.0
```

In [31]:
```
df['trestbps'].max()
```

Out[31]:
```
200.0
```

In [33]:
```
df[df==0].count()
```

Out[33]:
```
age           0
sex         312
cp          497
trestbps      0
chol          0
fbs         873
restecg     496
thalach       0
exang       681
oldpeak     329
slope        73
ca          577
thal          7
target      499
dtype: int64
```

In [35]:
```
df['age'].sum()
```

Out[35]:

55794

In [37]:

Out[37]:
```
df['age'].count()
```

In [39]:

Out[39]:

1025

```
df.isna()
```

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope
0	False	False	False	False	False	False	False	False	False	False	False

1	False	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...	...	..
1020	False	False	False	False	False	False	False	False	False	False	False
1021	False	False	False	False	False	False	False	False	False	False	False
1022	False	False	False	False	False	False	False	False	False	False	False
1023	False	False	False	False	False	False	False	False	False	False	False
1024	False	False	False	False	False	False	False	False	False	False	False

1025 rows × 14 columns

In [41]:
```
df.isnull().sum()
```

Out[41]:
```
age         0
sex         0
cp          0
trestbps    1
chol        0
fbs         0
restecg     0
thalach     0
exang       0
oldpeak     0
slope       0
ca          0
thal        0
target      0
dtype: int64
```

In [43]:
```
df=df.fillna(df.median())
```

In [45]:
```
df.isna().sum()
```

```
Out[45]: age         0
         sex         0
         cp          0
         trestbps    0
         chol        0
         fbs         0
         restecg     0
         thalach     0
         exang       0
         oldpeak     0
         slope       0
         ca          0
         thal        0
         target      0
         dtype: int64
```

```
In [47]: df.duplicated()
```

```
Out[47]: 0      False
         1      False
         2      False
         3      False
         4      False       ...
         1020    True
         1021    True
         1022    True
         1023    True
         1024    True
         Length: 1025, dtype: bool
```

```
In [49]: df.duplicated().sum()
```

```
Out[49]: 721
```

```
In [51]: df=df.drop_duplicates()
```

```
In [53]: df.shape
```

```
Out[53]: (304, 14)
```

```
In [55]:
```

```
df
```

Out[55]:

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	th
0	52	1	0	125.0	212	0	1	168	0	1.0	2	2	
1	52	1	0	125.0	87	0	1	168	0	1.0	2	2	
2	70	1	0	145.0	174	0	1	125	1	2.6	0	0	
3	61	1	0	148.0	203	0	1	161	0	0.0	2	1	
4	62	0	0	138.0	294	1	1	106	0	1.9	1	3	
...	...	...	...	...	...	...	...	...	...	...	...	...	
723	68	0	2	120.0	211	0	0	115	0	1.5	1	0	
733	44	0	2	108.0	141	0	1	175	0	0.6	1	0	
739	52	1	0	128.0	255	0	1	161	1	0.0	2	1	
843	59	1	3	160.0	273	0	0	125	0	0.0	2	0	
878	54	1	0	120.0	188	0	1	113	0	1.4	1	1	

304 rows × 14 columns

In [57]:
```
df.dtypes
```

Out[57]:
```
age           int64
sex           int64
cp            int64
trestbps    float64
chol          int64
fbs           int64
restecg       int64
thalach       int64
exang         int64
oldpeak     float64
slope         int64
ca            int64
thal          int64
target        int64
dtype: object
```

In [59]:
```
df=df.astype({'trestbps':'int','oldpeak':'int'})
```

In [61]:
```
df.dtypes
```

Out[61]:
```
age         int64
sex         int64
cp          int64
trestbps    int32
chol        int64
fbs         int64
restecg     int64
thalach     int64
exang       int64
oldpeak     int32
slope       int64
ca          int64
thal        int64
target      int64
dtype: object
```

In [63]:

In [64]:

In [65]:

In [67]:

```
import matplotlib.pyplot as plt
```

```
from sklearn.model_selection import train_test_split
```

```
x=df.drop('target',axis='columns')
```

```
x
```

Out[67]:

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	th
0	52	1	0	125	212	0	1	168	0	1	2	2	
1	52	1	0	125	87	0	1	168	0	1	2	2	
2	70	1	0	145	174	0	1	125	1	2	0	0	
3	61	1	0	148	203	0	1	161	0	0	2	1	
4	62	0	0	138	294	1	1	106	0	1	1	3	
...	...	...	...	...	...	...	...	...	...	...	...	...	
723	68	0	2	120	211	0	0	115	0	1	1	0	
733	44	0	2	108	141	0	1	175	0	0	1	0	
739	52	1	0	128	255	0	1	161	1	0	2	1	
843	59	1	3	160	273	0	0	125	0	0	2	0	
878	54	1	0	120	188	0	1	113	0	1	1	1	

304 rows × 13 columns

In [68]:
```
y=df['target']
```

In [69]:
```
y
```

Out[69]:
```
0      0 1
 0
 2      0
 3      0
 4      0       .. 723    1
 733    1
 739    0
 843    0
 878    0
 Name: target, Length: 304, dtype: int64
```

In [70]:
```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.25)
```

In [77]:
```
x_train.shape
```

Out[77]: (228, 13)

In [79]:
```
x_test.shape
```

Out[79]: (76, 13)

In [81]:
```
y_train.shape
```

Out[81]: (228,)

In [83]:
```
y_test.shape
```

Out[83]: (76,)

In [85]:
```
y_test.shape
```

Out[85]: (76,)

In [87]:
```
from sklearn.linear_model import LogisticRegression
```

In [88]:
```
reg = LogisticRegression()
```

In [91]:
```
reg.fit(x_train,y_train)
```

```
C:\Users\PRATIK\anaconda3\Lib\site-packages\sklearn\linear_model\_logistic.py:45   8:
ConvergenceWarning: lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.

Increase the number of iterations (max_iter) or scale the data as shown in:
https://scikit-learn.org/stable/modules/preprocessing.html Please also refer
to the documentation for alternative solver options:
```

```
https://scikit-learn.org/stable/modules/linear_model.html#logistic-regression
n_iter_i = _check_optimize_result(
```

Out[91]: LogisticRegression

LogisticRegression()

In [93]:
```
y_predict=reg.predict(x_test)
```

In [95]:
```
y_predict.shape
```

Out[95]: (76,)

In [97]:
```
from sklearn.metrics import accuracy_score
```

In [99]:
```
print(accuracy_score(y_test,y_predict))
```

```
0.8552631578947368
```

In [101…
```
from sklearn.metrics import classification_report
```

In [103…
```
print(classification_report(y_test,y_predict))
```

```
precision    recall  f1-score   support

           0       0.85      0.77      0.81        30
           1       0.86      0.91      0.88        46

    accuracy                           0.86        76
macro avg       0.85      0.84      0.85        76
weighted avg       0.86      0.86      0.85        76
```

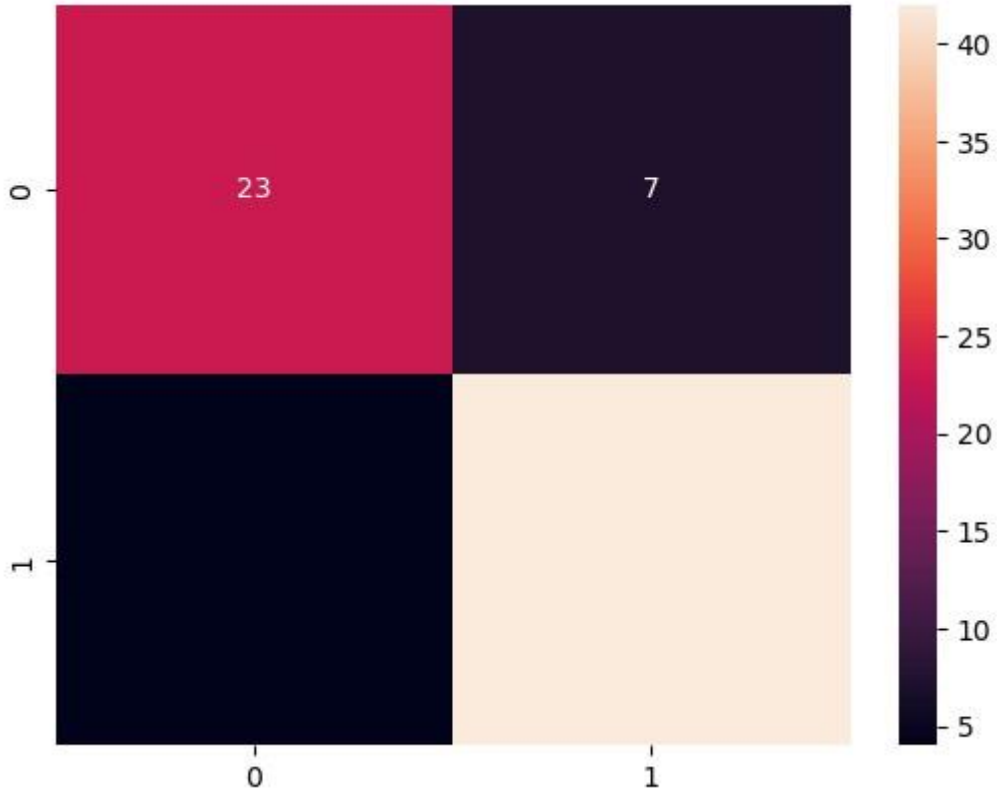
In [105…
```
from sklearn.metrics import confusion_matrix
```

In [107…
```
print(confusion_matrix(y_test,y_predict))
```

```
[[23  7]
 [ 4 42]]
```

In [109…
```
import seaborn as sns
```

In [111…
```
sns.heatmap(confusion_matrix(y_test,y_predict),annot=True)
```
Out[111… <Axes: >



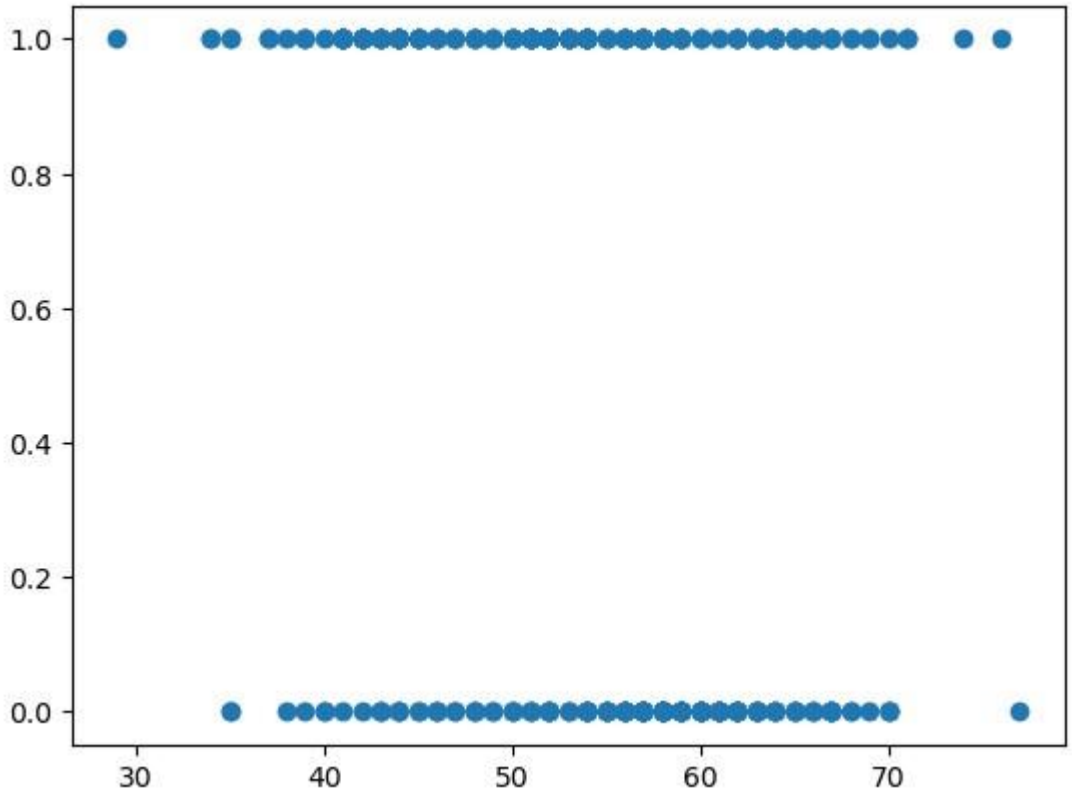
In [113…
```
import matplotlib.pyplot as plt
```

In [115…
```
x=df['age']
```

In [117…
```
y=df['target']
```

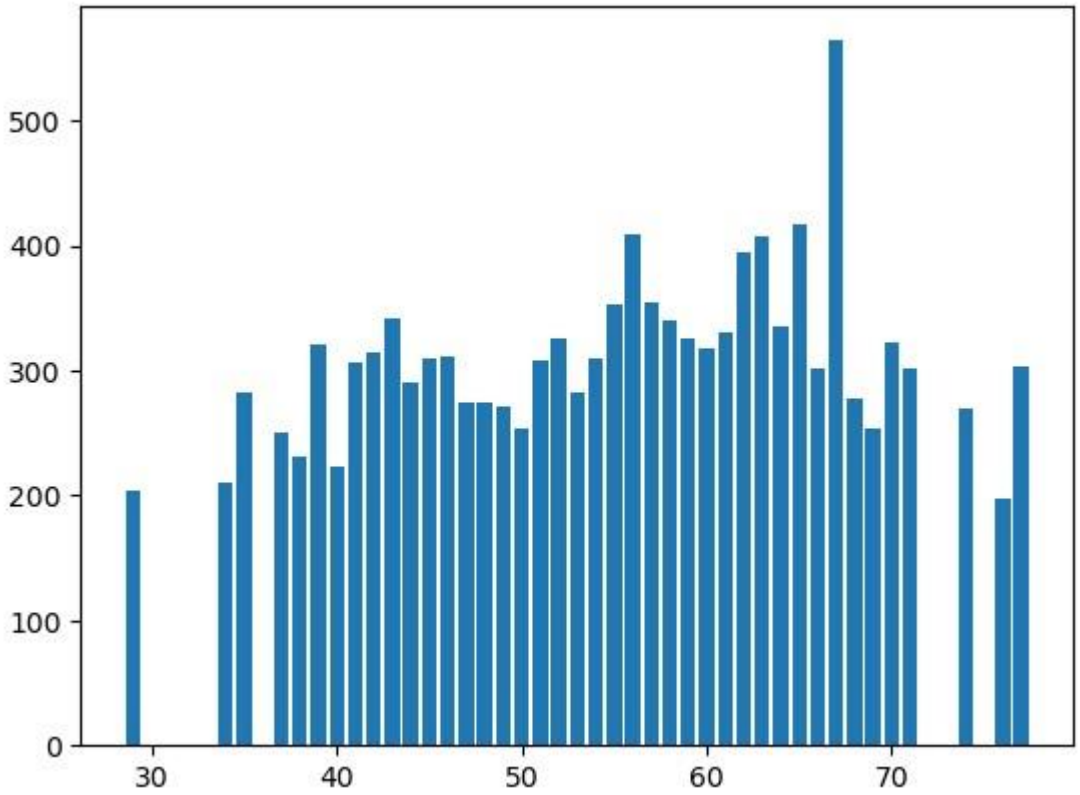
In [119…
```
plt.scatter(x,y)
```

Out[119… <matplotlib.collections.PathCollection at 0x2430569e390>



In [121…
```
plt.bar(df['age'],df['chol'])
```

Out[121… <BarContainer object of 304 artists>



In [ ]:

In [ ]:

In [ ]: