



UTM

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SECI2143-05

Probability & Statistical Data Analysis

PROJECT 2

(Statistical Analysis using R and RStudio)

LECTURER:

Dr. Sharin Hazlin Binti Huspi

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Group Members

NO.	NAME	MATRIC NUMBER	SECTION
1	ARSHAD PARVEZ DIPTO	A21EC4007	05
2	MOHAMMED HUSSEIN SALEH BA ABBAD	A21EC4015	
3	MOATAZ ABDO MOHAMMED AL- SHATER	A21EC4011	
4	YOUSEF KHALED SALEH ABDULLAH	A21EC4023	

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1. Introduction and Background

Heart attacks are considered a serious health concern worldwide. They have a serious impact on both a person's and their family member's physical and mental health, as well as on their quality of life. Heart attacks even have the potential to hamper social health. The condition typically affects elderly and senior individuals. It has also been noted that this issue is most common in developed countries, perhaps as a result of the nations' residents' lifestyles and, of course, how they interact with the environment. Heart attack also affects young people, which we can prove through statistics, as our dataset has valid evidence. However, this is a massively researched topic and many publications have proved this claim. Hence, we decided to not work on proving that statement.

But in our project, we have worked on proving similar statements or proving them wrong. There are some myths, such as "Men are twice as likely to experience heart attacks compared to women" and "Heart attacks are a man's disease" and we want to check their legitimacy. And thus, we are currently interested in the causes of these heart attacks and the subset of the population that is most seriously affected. The project's goal is to investigate the association between heart attacks and variables like age, sex, exercise, chest pain and blood pressure etc. We believe that the data will allow us to identify the variable that is primarily responsible for heart attacks as well as identify the age group that are the most affected in our sample.

2. Dataset:

The dataset that was chosen for this project addresses some indicators (variables) for heart attack classification. The dataset contains data about 303 people that have gone through medical tests. The first table describes the variables we have selected from the dataset and the second table demonstrates the use of the variables, while also including a quick summary of the tests that were conducted.

First Table

Variable Names	Description	Data type (Based on levels of measurement)
gender	The gender of the person	Nominal
age	The age of the person	Ratio
cp	Affected chest pain type (1 – typical angina, 2 – atypical angina, 3 – non-anginal pain and 4 – asymptomatic)	Ordinal
trtbps	The person's resting blood pressure (measured in mm Hg)	Ratio
thalachh	The maximum heart pulse rate	Ratio
rest_ecg	The resting electrocardiographic results (0 – normal, 1 – having ST-T wave abnormality, 2 – showing probable or definite left ventricular hypertrophy)	Ordinal

Second table

Selected Variable(s)	Tests Conducted	Description
thalachh, gender	Hypothesis testing (two sample test)	Explanation: We had selected these variables to test whether the means of maximum heart rates were the same or not for males and females at a significance level of 5% Possible outcome: The means of maximum heart rates for males and females are not equal.
trtbps, age	Correlation analysis	Explanation: These variables were used to test if there existed a linear relationship between age and resting blood pressure, using Pearson's Product-Moment Correlation Coefficient at a significance level of $\alpha = 0.05$.

		Possible outcome: A weak positive relationship exists between age and resting blood pressure. Hence, by the time individuals become older, their blood pressure is expected to become comparatively higher.
trtbps, thalachh	Regression analysis	Explanation: Both of these variables were used to test if resting blood pressures depend on heart pulse rates or not. A significance level of 5% was used. Possible outcome: Resting blood pressure does not depend on maximum heart rate, and no linear relationship exists between them.
cp, gender	Chi-Square test of independence, with a two-way contingency table.	Explanation: We had chosen these variables in order to test whether chest pain occurred equally to both genders, male and female. The significance level used for this was 5%. Possible outcome: Chest pain is most likely to be dependent on gender, and a strong relationship exists between the gender of the patient and the type of chest pain.
rest_ecg	Goodness of Fit	Explanation: This variable had been chosen in order to test the resting electrocardiographic results of the patients and to test whether the three types have the same proportions, at 5% significance level. Possible outcome: The proportions are the same. Although, the proportions for group 0 and 1 are around the same, the proportion from group 2 differs greatly from them.

3. Data Analysis

3.1 Hypothesis Testing (2-sample)

The variables used for this hypothesis test were the genders of the patient and their maximum heart rates. This statistical analysis was a two-sample hypothesis testing, where we tested whether there were differences between the means of maximum heart rates between males and females. We have assumed that both variances are equal and we have used a significance level of $\alpha = 0.05$.

Hypothesis statement:

$$H_0: \mu_1 = \mu_2 \quad (\text{same mean})$$

$$H_1: \mu_1 \neq \mu_2 \quad (\text{different mean})$$

Test statistics:

$$n_1 = 207, \bar{x}_1 = 148.9614 \text{ (male)}$$

$$n_2 = 96, \bar{x}_2 = 151.1250 \text{ (female)}$$

```
> print(thalachh.sex.htest)

Two Sample t-test

data: thalachh by sex
t = 0.76446, df = 301, p-value = 0.4452
alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0
95 percent confidence interval:
 -3.406039  7.733334
sample estimates:
mean in group 0 mean in group 1
 151.1250      148.9614

> apa(thalachh.sex.htest)
[1] "mean difference = -2.16, t(301) = 0.76, p = 0.45 (2-tailed)"
> |
```

Figure 1. Output for the two-sample t-test in RStudio

The necessary results obtained from RStudio were $t_0 = 0.76446$, $df = 301$ and $p\text{-value} = 0.4452$.

However, the $p\text{-value} (0.4452) < 0.05$. Hence, we failed to reject the null hypothesis.

Conclusion:

At 0.05 level of significance, there was not sufficient evidence to prove that the means for the maximum heart rate achieved differed between the two genders, male and female.

3.2 Correlation Test

The variables used for the correlation analysis were the age of 303 patients and their resting blood pressures (referred as the variable, trtbps). The analysis intended to test if any linear relationship existed between the age of patients and their resting blood pressure using a significance level of $\alpha = 0.05$.

Hypothesis statement:

$H_0: \rho = 0$ (no linear relation)

$H_1: \rho \neq 0$ (linear correlation exists)

Test statistics:

```
> print(age.trtbps.cctest)

Pearson's product-moment correlation

data: age and trtbps
t = 5.0475, df = 301, p-value = 7.762e-07
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.1720897 0.3800657
sample estimates:
cor
0.2793509

> apa(age.trtbps.cctest)
[1] "r = 0.28, t(301) = 5.05, p < 0.01 (2-tailed)"
>
```

Figure 2. Outputs for the Correlation test in RStudio

The result obtained from (R) indicated that $p\text{-value} = 7.762e-07$, while the value of $\alpha = 0.05$. However, for the H_0 to be rejected, $P(\text{value})$ must be less or equal to $\alpha = 0.05$, and this condition is satisfied because $7.762e-07 < 0.05$.

Therefore, here we rejected the null hypothesis (H_0) and we have concluded that there was enough evidence to prove that a linear relationship exists.

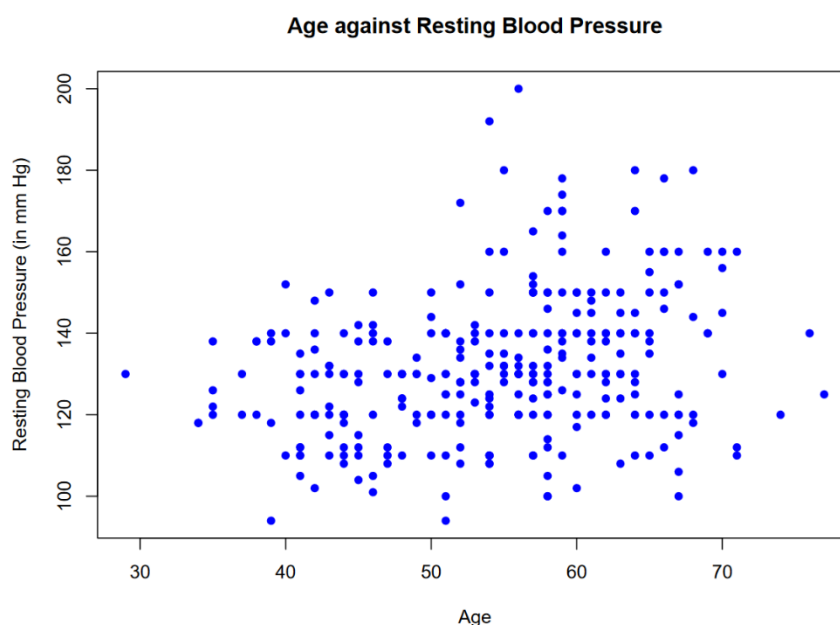


Figure 3. Scatterplot demonstrating age against resting blood pressure

Conclusion:

We have noticed from the scatter plot that it had shown that the slope had a tendency to very slightly increase, which subsequently depicted a positive relationship between age and resting blood pressure. This relationship stated that if people were to get older the possibility of their blood pressure increasing was slightly higher. However, this seemed to be a very weak relationship as most of the points were not very dense.

3.3 Regression Test

The variables used in this regression analysis were resting blood pressure and maximum heart rates, which explains the reason why we only have one linear regression model. The objective of this test was to figure out if a relationship actually existed between maximum heart rates and resting blood pressure. The dependent value in our case was the blood pressure and the independent value as maximum heart rate. The significance level used was $\alpha = 0.05$.

Hypothesis Statement:

$H_0: \beta_1 = 0$ (no linear relationship)

$H_1: \beta_1 \neq 0$ (linear relationship exists)

Test Statistics:

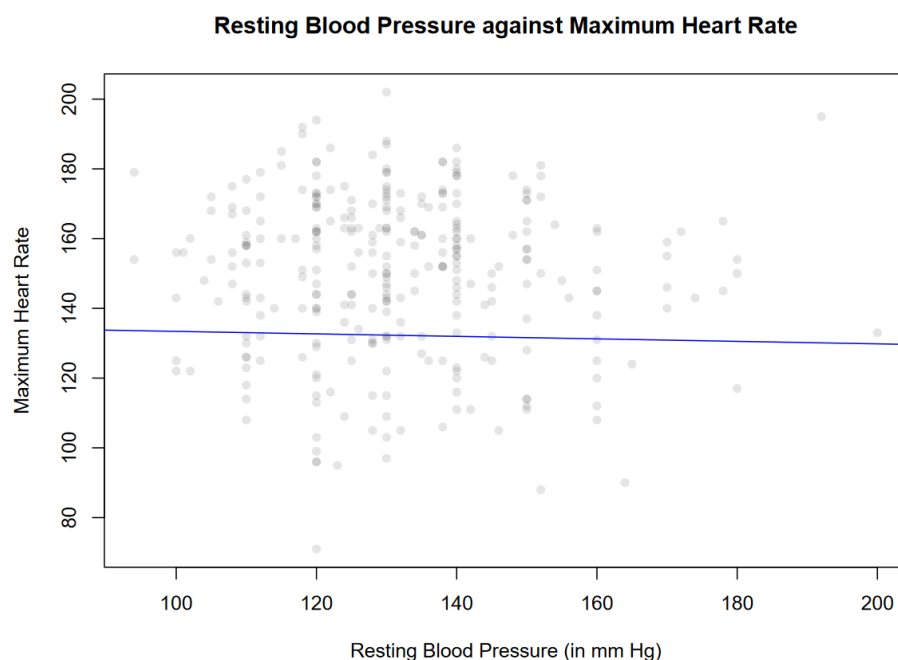


Figure 4. Scatterplot demonstrating resting blood pressure against maximum heart rates and the regression

We concluded by looking at the scatter plot that a significantly weak negative relationship existed between resting blood pressure and maximum heart rates. In other words, there is a very weak negative relationship that it's possible to become obsolete.


```

> summary(trtbps.thalachh.lm)

Call:
lm(formula = trtbps ~ thalachh, data = heart)

Residuals:
    Min       1Q   Median       3Q      Max
-37.468 -11.772  -1.611   8.836  67.781

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 136.97450    6.67379   20.524  <2e-16 ***
thalachh     -0.03576    0.04409   -0.811    0.418
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 17.55 on 301 degrees of freedom
Multiple R-squared:  0.002181, Adjusted R-squared: -0.001134
F-statistic: 0.6578 on 1 and 301 DF, p-value: 0.418

```

Figure 5. Outputs for the linear regression in RStudio

From this analysis we were able to get the values of both the *Intercept* = 136.97450, as well as the *Slope* = (−0.03576), which helped us in solving the estimated regression model equation: $\hat{y} = 136.97450 + (-0.03576)x$.

We were also able to use this equation in solving the values of *SST* and *SSR* so that we get the value of R-squared from the equation: $R^2 = \frac{SSR}{SST} = 0.002181$. This R^2 value can also support the claim that the relationship is quite weak obtained from RStudio which equaled 0.002181.

Conclusion:

Using the value obtained from (R), which gave a P-value equals to 0.418. Since the P-value $> \alpha$, $0.418 > 0.05$. We failed to reject the null hypothesis. In addition, the t value which equaled -0.811, we could clearly conclude that a negative linear relationship could not exist between resting blood pressure and maximum heart rates, since this relationship is extremely weak.

3.4 Goodness of Fit Test

We chose resting electrocardiographic results as our variable in this part, so we had conducted a study on 303 patients. Hence, we tested the whether the proportions are equal or not for all types of results using the Goodness of Fit test. (Significance level 5%)

Hypothesis statement:

$H_0: p_1 = p_2 = p_3$

H_1 : At least one of the proportions is different from the others.

Test statistics:

```

> print(restecq.gof)

      Chi-squared test for given probabilities

data:  table(heart$restecg)
X-squared = 139.86, df = 2, p-value < 2.2e-16

> apa(restecq.gof)
[1] "X(2, N = 303) = 139.86, p < 0.01 (2-tailed)"
>

```

Figure 6. Outputs for the Goodness of Fit test in RStudio

Obtained from RStudio, $E = n/k = 303/3 = 101$, $\chi^2 = 139.86$, $df = 2$

p-value = 2.2e-16

The test statistic had shown that the p-value was less than α (which is 0.05). Consequently, we had rejected the null hypothesis.

Conclusion:

Thus, we reject the claim that the three types of results are equal for our patients' sample.

3.5 Chi-Square test of independence

Gender and chest pain type were the variables we used to do the Chi square of independence. We tested whether pain types are the same with males and females (independent of gender). This meant that we had to use a Chi-Square test and two-way contingency table. A significance level of $\alpha=0.05$ was used for this analysis.

Hypothesis Statement:

H_0 : Chest pain type is not dependent/contingent on gender.

H_1 : Chest pain Type is dependent/contingent on gender.

Test Statistics:

```
> print(sex.cp.chisqtest)

      Pearson's Chi-squared test

data:  table(heart$sex, heart$cp)
X-squared = 6.8221, df = 3, p-value = 0.07779

> apa(sex.cp.chisqtest)
[1] "X(3, N = 303) = 6.82, p = 0.08 (2-tailed)"
> |
```

Figure 7. Outputs for the Chi-squared test in RStudio

From RStudio, we got the chi-square value to be ($X^2 = 6.8221$), and the degree of freedom, ($df = K = 3$). We also obtained the value of p-value = 0.07779.

Since p-value = 0.07779 > 0.05. We failed to reject the null hypothesis (H_0).

Conclusion:

Therefore, there was no sufficient evidence to prove that chest pain type is related to gender. Hence, it is absolutely safe to say that it does not matter whether the patient is male or female, there is simply no proof that they will experience different types of chest pain.

4. Conclusion

Through 5 different statistical analysis tests we had concluded, there were some interesting results. The myth we have previously mentioned in the introduction were certainly not legitimate. However, it is ironic that the heart attack possibilities do indeed differ between genders. Men are indeed more likely to experience it. We also found out that there was a relation between the age of a person and their blood pressure. Despite the fact that the relationship between aging and blood pressure were quite weak, we still could not say that there was no link between them and we certainly could not conclude that they did not affect each other. But we could rather say that the older people become, the possibility of them experiencing high blood pressure increases, and that could cause them to experience heart attacks. We found out a positive linear relationship between the resting blood pressure and maximum heart rate achieved, albeit it was quite weak. But it is a common myth that heart pulse rates and blood pressures greatly affect each other, so that was a myth busted. Further test results indicated that the proportions for the sample's resting electrocardiographic results were not equal. While the 'normal' and 'ST-T wave abnormality' groups had nearly the same proportion, 'probable or definite left ventricular hypertrophy' group's proportion greatly differed from them. And finally, the type of chest pain suffered by a person does not have any relation with their gender whatsoever.

5.0 Appendices

5.1 Raw Data

age	gender	cp	trtbps	chol	fbs	restecg	thalach	exng	oldpeak	slp	caa	thall	output
63	1	3	145	233	1	0	150	0	2.3	0	0	1	1
37	1	2	130	250	0	1	187	0	3.5	0	0	2	1
41	0	1	130	204	0	0	172	0	1.4	2	0	2	1
56	1	1	120	236	0	1	178	0	0.8	2	0	2	1
57	0	0	120	354	0	1	163	1	0.6	2	0	2	1
57	1	0	140	192	0	1	148	0	0.4	1	0	1	1
56	0	1	140	294	0	0	153	0	1.3	1	0	2	1
44	1	1	120	263	0	1	173	0	0	2	0	3	1
52	1	2	172	199	1	1	162	0	0.5	2	0	3	1
57	1	2	150	168	0	1	174	0	1.6	2	0	2	1
54	1	0	140	239	0	1	160	0	1.2	2	0	2	1
48	0	2	130	275	0	1	139	0	0.2	2	0	2	1
49	1	1	130	266	0	1	171	0	0.6	2	0	2	1
64	1	3	110	211	0	0	144	1	1.8	1	0	2	1
58	0	3	150	283	1	0	162	0	1	2	0	2	1
50	0	2	120	219	0	1	158	0	1.6	1	0	2	1
58	0	2	120	340	0	1	172	0	0	2	0	2	1
66	0	3	150	226	0	1	114	0	2.6	0	0	2	1
43	1	0	150	247	0	1	171	0	1.5	2	0	2	1
69	0	3	140	239	0	1	151	0	1.8	2	2	2	1
59	1	0	135	234	0	1	161	0	0.5	1	0	3	1
44	1	2	130	233	0	1	179	1	0.4	2	0	2	1
42	1	0	140	226	0	1	178	0	0	2	0	2	1
61	1	2	150	243	1	1	137	1	1	1	0	2	1
40	1	3	140	199	0	1	178	1	1.4	2	0	3	1
71	0	1	160	302	0	1	162	0	0.4	2	2	2	1
59	1	2	150	212	1	1	157	0	1.6	2	0	2	1
51	1	2	110	175	0	1	123	0	0.6	2	0	2	1
65	0	2	140	417	1	0	157	0	0.8	2	1	2	1
53	1	2	130	197	1	0	152	0	1.2	0	0	2	1
41	0	1	105	198	0	1	168	0	0	2	1	2	1
65	1	0	120	177	0	1	140	0	0.4	2	0	3	1
44	1	1	130	219	0	0	188	0	0	2	0	2	1
54	1	2	125	273	0	0	152	0	0.5	0	1	2	1
51	1	3	125	213	0	0	125	1	1.4	2	1	2	1
46	0	2	142	177	0	0	160	1	1.4	0	0	2	1
54	0	2	135	304	1	1	170	0	0	2	0	2	1
54	1	2	150	232	0	0	165	0	1.6	2	0	3	1
65	0	2	155	269	0	1	148	0	0.8	2	0	2	1
65	0	2	160	360	0	0	151	0	0.8	2	0	2	1
51	0	2	140	308	0	0	142	0	1.5	2	1	2	1
48	1	1	130	245	0	0	180	0	0.2	1	0	2	1
45	1	0	104	208	0	0	148	1	3	1	0	2	1
53	0	0	130	264	0	0	143	0	0.4	1	0	2	1

39	1	2	140	321	0	0	182	0	0	2	0	2	1
52	1	1	120	325	0	1	172	0	0.2	2	0	2	1
44	1	2	140	235	0	0	180	0	0	2	0	2	1
47	1	2	138	257	0	0	156	0	0	2	0	2	1
53	0	2	128	216	0	0	115	0	0	2	0	0	1
53	0	0	138	234	0	0	160	0	0	2	0	2	1
51	0	2	130	256	0	0	149	0	0.5	2	0	2	1
66	1	0	120	302	0	0	151	0	0.4	1	0	2	1
62	1	2	130	231	0	1	146	0	1.8	1	3	3	1
44	0	2	108	141	0	1	175	0	0.6	1	0	2	1
63	0	2	135	252	0	0	172	0	0	2	0	2	1
52	1	1	134	201	0	1	158	0	0.8	2	1	2	1
48	1	0	122	222	0	0	186	0	0	2	0	2	1
45	1	0	115	260	0	0	185	0	0	2	0	2	1
34	1	3	118	182	0	0	174	0	0	2	0	2	1
57	0	0	128	303	0	0	159	0	0	2	1	2	1
71	0	2	110	265	1	0	130	0	0	2	1	2	1
54	1	1	108	309	0	1	156	0	0	2	0	3	1
52	1	3	118	186	0	0	190	0	0	1	0	1	1
41	1	1	135	203	0	1	132	0	0	1	0	1	1
58	1	2	140	211	1	0	165	0	0	2	0	2	1
35	0	0	138	183	0	1	182	0	1.4	2	0	2	1
51	1	2	100	222	0	1	143	1	1.2	1	0	2	1
45	0	1	130	234	0	0	175	0	0.6	1	0	2	1
44	1	1	120	220	0	1	170	0	0	2	0	2	1
62	0	0	124	209	0	1	163	0	0	2	0	2	1
54	1	2	120	258	0	0	147	0	0.4	1	0	3	1
51	1	2	94	227	0	1	154	1	0	2	1	3	1
29	1	1	130	204	0	0	202	0	0	2	0	2	1
51	1	0	140	261	0	0	186	1	0	2	0	2	1
43	0	2	122	213	0	1	165	0	0.2	1	0	2	1
55	0	1	135	250	0	0	161	0	1.4	1	0	2	1
51	1	2	125	245	1	0	166	0	2.4	1	0	2	1
59	1	1	140	221	0	1	164	1	0	2	0	2	1
52	1	1	128	205	1	1	184	0	0	2	0	2	1
58	1	2	105	240	0	0	154	1	0.6	1	0	3	1
41	1	2	112	250	0	1	179	0	0	2	0	2	1
45	1	1	128	308	0	0	170	0	0	2	0	2	1
60	0	2	102	318	0	1	160	0	0	2	1	2	1
52	1	3	152	298	1	1	178	0	1.2	1	0	3	1
42	0	0	102	265	0	0	122	0	0.6	1	0	2	1
67	0	2	115	564	0	0	160	0	1.6	1	0	3	1
68	1	2	118	277	0	1	151	0	1	2	1	3	1
46	1	1	101	197	1	1	156	0	0	2	0	3	1
54	0	2	110	214	0	1	158	0	1.6	1	0	2	1

58	0	0	100	248	0	0	122	0	1	1	0	2	1
48	1	2	124	255	1	1	175	0	0	2	2	2	1
57	1	0	132	207	0	1	168	1	0	2	0	3	1
52	1	2	138	223	0	1	169	0	0	2	4	2	1
54	0	1	132	288	1	0	159	1	0	2	1	2	1
45	0	1	112	160	0	1	138	0	0	1	0	2	1
53	1	0	142	226	0	0	111	1	0	2	0	3	1
62	0	0	140	394	0	0	157	0	1.2	1	0	2	1
52	1	0	108	233	1	1	147	0	0.1	2	3	3	1
43	1	2	130	315	0	1	162	0	1.9	2	1	2	1
53	1	2	130	246	1	0	173	0	0	2	3	2	1
42	1	3	148	244	0	0	178	0	0.8	2	2	2	1
59	1	3	178	270	0	0	145	0	4.2	0	0	3	1
63	0	1	140	195	0	1	179	0	0	2	2	2	1
42	1	2	120	240	1	1	194	0	0.8	0	0	3	1
50	1	2	129	196	0	1	163	0	0	2	0	2	1
68	0	2	120	211	0	0	115	0	1.5	1	0	2	1
69	1	3	160	234	1	0	131	0	0.1	1	1	2	1
45	0	0	138	236	0	0	152	1	0.2	1	0	2	1
50	0	1	120	244	0	1	162	0	1.1	2	0	2	1
50	0	0	110	254	0	0	159	0	0	2	0	2	1
64	0	0	180	325	0	1	154	1	0	2	0	2	1
57	1	2	150	126	1	1	173	0	0.2	2	1	3	1
64	0	2	140	313	0	1	133	0	0.2	2	0	3	1
43	1	0	110	211	0	1	161	0	0	2	0	3	1
55	1	1	130	262	0	1	155	0	0	2	0	2	1
37	0	2	120	215	0	1	170	0	0	2	0	2	1
41	1	2	130	214	0	0	168	0	2	1	0	2	1
56	1	3	120	193	0	0	162	0	1.9	1	0	3	1
46	0	1	105	204	0	1	172	0	0	2	0	2	1
46	0	0	138	243	0	0	152	1	0	1	0	2	1
64	0	0	130	303	0	1	122	0	2	1	2	2	1
59	1	0	138	271	0	0	182	0	0	2	0	2	1
41	0	2	112	268	0	0	172	1	0	2	0	2	1
54	0	2	108	267	0	0	167	0	0	2	0	2	1
39	0	2	94	199	0	1	179	0	0	2	0	2	1
34	0	1	118	210	0	1	192	0	0.7	2	0	2	1
47	1	0	112	204	0	1	143	0	0.1	2	0	2	1
67	0	2	152	277	0	1	172	0	0	2	1	2	1
52	0	2	136	196	0	0	169	0	0.1	1	0	2	1
74	0	1	120	269	0	0	121	1	0.2	2	1	2	1
54	0	2	160	201	0	1	163	0	0	2	1	2	1
49	0	1	134	271	0	1	162	0	0	1	0	2	1
42	1	1	120	295	0	1	162	0	0	2	0	2	1
41	1	1	110	235	0	1	153	0	0	2	0	2	1

41	0	1	126	306	0	1	163	0	0	2	0	2	1
49	0	0	130	269	0	1	163	0	0	2	0	2	1
60	0	2	120	178	1	1	96	0	0	2	0	2	1
62	1	1	128	208	1	0	140	0	0	2	0	2	1
57	1	0	110	201	0	1	126	1	1.5	1	0	1	1
64	1	0	128	263	0	1	105	1	0.2	1	1	3	1
51	0	2	120	295	0	0	157	0	0.6	2	0	2	1
43	1	0	115	303	0	1	181	0	1.2	1	0	2	1
42	0	2	120	209	0	1	173	0	0	1	0	2	1
67	0	0	106	223	0	1	142	0	0.3	2	2	2	1
76	0	2	140	197	0	2	116	0	1.1	1	0	2	1
70	1	1	156	245	0	0	143	0	0	2	0	2	1
44	0	2	118	242	0	1	149	0	0.3	1	1	2	1
60	0	3	150	240	0	1	171	0	0.9	2	0	2	1
44	1	2	120	226	0	1	169	0	0	2	0	2	1
42	1	2	130	180	0	1	150	0	0	2	0	2	1
66	1	0	160	228	0	0	138	0	2.3	2	0	1	1
71	0	0	112	149	0	1	125	0	1.6	1	0	2	1
64	1	3	170	227	0	0	155	0	0.6	1	0	3	1
66	0	2	146	278	0	0	152	0	0	1	1	2	1
39	0	2	138	220	0	1	152	0	0	1	0	2	1
58	0	0	130	197	0	1	131	0	0.6	1	0	2	1
47	1	2	130	253	0	1	179	0	0	2	0	2	1
35	1	1	122	192	0	1	174	0	0	2	0	2	1
58	1	1	125	220	0	1	144	0	0.4	1	4	3	1
56	1	1	130	221	0	0	163	0	0	2	0	3	1
56	1	1	120	240	0	1	169	0	0	0	0	2	1
55	0	1	132	342	0	1	166	0	1.2	2	0	2	1
41	1	1	120	157	0	1	182	0	0	2	0	2	1
38	1	2	138	175	0	1	173	0	0	2	4	2	1
38	1	2	138	175	0	1	173	0	0	2	4	2	1
67	1	0	160	286	0	0	108	1	1.5	1	3	2	0
67	1	0	120	229	0	0	129	1	2.6	1	2	3	0
62	0	0	140	268	0	0	160	0	3.6	0	2	2	0
63	1	0	130	254	0	0	147	0	1.4	1	1	3	0
53	1	0	140	203	1	0	155	1	3.1	0	0	3	0
56	1	2	130	256	1	0	142	1	0.6	1	1	1	0
48	1	1	110	229	0	1	168	0	1	0	0	3	0
58	1	1	120	284	0	0	160	0	1.8	1	0	2	0
58	1	2	132	224	0	0	173	0	3.2	2	2	3	0
60	1	0	130	206	0	0	132	1	2.4	1	2	3	0
40	1	0	110	167	0	0	114	1	2	1	0	3	0
60	1	0	117	230	1	1	160	1	1.4	2	2	3	0
64	1	2	140	335	0	1	158	0	0	2	0	2	0
43	1	0	120	177	0	0	120	1	2.5	1	0	3	0

57	1	0	150	276	0	0	112	1	0.6	1	1	1	0
55	1	0	132	353	0	1	132	1	1.2	1	1	3	0
65	0	0	150	225	0	0	114	0	1	1	3	3	0
61	0	0	130	330	0	0	169	0	0	2	0	2	0
58	1	2	112	230	0	0	165	0	2.5	1	1	3	0
50	1	0	150	243	0	0	128	0	2.6	1	0	3	0
44	1	0	112	290	0	0	153	0	0	2	1	2	0
60	1	0	130	253	0	1	144	1	1.4	2	1	3	0
54	1	0	124	266	0	0	109	1	2.2	1	1	3	0
50	1	2	140	233	0	1	163	0	0.6	1	1	3	0
41	1	0	110	172	0	0	158	0	0	2	0	3	0
51	0	0	130	305	0	1	142	1	1.2	1	0	3	0
58	1	0	128	216	0	0	131	1	2.2	1	3	3	0
54	1	0	120	188	0	1	113	0	1.4	1	1	3	0
60	1	0	145	282	0	0	142	1	2.8	1	2	3	0
60	1	2	140	185	0	0	155	0	3	1	0	2	0
59	1	0	170	326	0	0	140	1	3.4	0	0	3	0
46	1	2	150	231	0	1	147	0	3.6	1	0	2	0
67	1	0	125	254	1	1	163	0	0.2	1	2	3	0
62	1	0	120	267	0	1	99	1	1.8	1	2	3	0
65	1	0	110	248	0	0	158	0	0.6	2	2	1	0
44	1	0	110	197	0	0	177	0	0	2	1	2	0
60	1	0	125	258	0	0	141	1	2.8	1	1	3	0
58	1	0	150	270	0	0	111	1	0.8	2	0	3	0
68	1	2	180	274	1	0	150	1	1.6	1	0	3	0
62	0	0	160	164	0	0	145	0	6.2	0	3	3	0
52	1	0	128	255	0	1	161	1	0	2	1	3	0
59	1	0	110	239	0	0	142	1	1.2	1	1	3	0
60	0	0	150	258	0	0	157	0	2.6	1	2	3	0
49	1	2	120	188	0	1	139	0	2	1	3	3	0
59	1	0	140	177	0	1	162	1	0	2	1	3	0
57	1	2	128	229	0	0	150	0	0.4	1	1	3	0
61	1	0	120	260	0	1	140	1	3.6	1	1	3	0
39	1	0	118	219	0	1	140	0	1.2	1	0	3	0
61	0	0	145	307	0	0	146	1	1	1	0	3	0
56	1	0	125	249	1	0	144	1	1.2	1	1	2	0
43	0	0	132	341	1	0	136	1	3	1	0	3	0
62	0	2	130	263	0	1	97	0	1.2	1	1	3	0
63	1	0	130	330	1	0	132	1	1.8	2	3	3	0
65	1	0	135	254	0	0	127	0	2.8	1	1	3	0
48	1	0	130	256	1	0	150	1	0	2	2	3	0
63	0	0	150	407	0	0	154	0	4	1	3	3	0
55	1	0	140	217	0	1	111	1	5.6	0	0	3	0
65	1	3	138	282	1	0	174	0	1.4	1	1	2	0
56	0	0	200	288	1	0	133	1	4	0	2	3	0

54	1	0	110	239	0	1	126	1	2.8	1	1	3	0
70	1	0	145	174	0	1	125	1	2.6	0	0	3	0
62	1	1	120	281	0	0	103	0	1.4	1	1	3	0
35	1	0	120	198	0	1	130	1	1.6	1	0	3	0
59	1	3	170	288	0	0	159	0	0.2	1	0	3	0
64	1	2	125	309	0	1	131	1	1.8	1	0	3	0
47	1	2	108	243	0	1	152	0	0	2	0	2	0
57	1	0	165	289	1	0	124	0	1	1	3	3	0
55	1	0	160	289	0	0	145	1	0.8	1	1	3	0
64	1	0	120	246	0	0	96	1	2.2	0	1	2	0
70	1	0	130	322	0	0	109	0	2.4	1	3	2	0
51	1	0	140	299	0	1	173	1	1.6	2	0	3	0
58	1	0	125	300	0	0	171	0	0	2	2	3	0
60	1	0	140	293	0	0	170	0	1.2	1	2	3	0
77	1	0	125	304	0	0	162	1	0	2	3	2	0
35	1	0	126	282	0	0	156	1	0	2	0	3	0
70	1	2	160	269	0	1	112	1	2.9	1	1	3	0
59	0	0	174	249	0	1	143	1	0	1	0	2	0
64	1	0	145	212	0	0	132	0	2	1	2	1	0
57	1	0	152	274	0	1	88	1	1.2	1	1	3	0
56	1	0	132	184	0	0	105	1	2.1	1	1	1	0
48	1	0	124	274	0	0	166	0	0.5	1	0	3	0
56	0	0	134	409	0	0	150	1	1.9	1	2	3	0
66	1	1	160	246	0	1	120	1	0	1	3	1	0
54	1	1	192	283	0	0	195	0	0	2	1	3	0
69	1	2	140	254	0	0	146	0	2	1	3	3	0
51	1	0	140	298	0	1	122	1	4.2	1	3	3	0
43	1	0	132	247	1	0	143	1	0.1	1	4	3	0
62	0	0	138	294	1	1	106	0	1.9	1	3	2	0
67	1	0	100	299	0	0	125	1	0.9	1	2	2	0
59	1	3	160	273	0	0	125	0	0	2	0	2	0
45	1	0	142	309	0	0	147	1	0	1	3	3	0
58	1	0	128	259	0	0	130	1	3	1	2	3	0
50	1	0	144	200	0	0	126	1	0.9	1	0	3	0
62	0	0	150	244	0	1	154	1	1.4	1	0	2	0
38	1	3	120	231	0	1	182	1	3.8	1	0	3	0
66	0	0	178	228	1	1	165	1	1	1	2	3	0
52	1	0	112	230	0	1	160	0	0	2	1	2	0
53	1	0	123	282	0	1	95	1	2	1	2	3	0
63	0	0	108	269	0	1	169	1	1.8	1	2	2	0
54	1	0	110	206	0	0	108	1	0	1	1	2	0
66	1	0	112	212	0	0	132	1	0.1	2	1	2	0
55	0	0	180	327	0	2	117	1	3.4	1	0	2	0
49	1	2	118	149	0	0	126	0	0.8	2	3	2	0
54	1	0	122	286	0	0	116	1	3.2	1	2	2	0

56	1	0	130	283	1	0	103	1	1.6	0	0	3	0
46	1	0	120	249	0	0	144	0	0.8	2	0	3	0
61	1	3	134	234	0	1	145	0	2.6	1	2	2	0
67	1	0	120	237	0	1	71	0	1	1	0	2	0
58	1	0	100	234	0	1	156	0	0.1	2	1	3	0
47	1	0	110	275	0	0	118	1	1	1	1	2	0
52	1	0	125	212	0	1	168	0	1	2	2	3	0
58	1	0	146	218	0	1	105	0	2	1	1	3	0
57	1	1	124	261	0	1	141	0	0.3	2	0	3	0
58	0	1	136	319	1	0	152	0	0	2	2	2	0
61	1	0	138	166	0	0	125	1	3.6	1	1	2	0
42	1	0	136	315	0	1	125	1	1.8	1	0	1	0
52	1	0	128	204	1	1	156	1	1	1	0	0	0
59	1	2	126	218	1	1	134	0	2.2	1	1	1	0
40	1	0	152	223	0	1	181	0	0	2	0	3	0
61	1	0	140	207	0	0	138	1	1.9	2	1	3	0
46	1	0	140	311	0	1	120	1	1.8	1	2	3	0
59	1	3	134	204	0	1	162	0	0.8	2	2	2	0
57	1	1	154	232	0	0	164	0	0	2	1	2	0
57	1	0	110	335	0	1	143	1	3	1	1	3	0
55	0	0	128	205	0	2	130	1	2	1	1	3	0
61	1	0	148	203	0	1	161	0	0	2	1	3	0
58	1	0	114	318	0	2	140	0	4.4	0	3	1	0
58	0	0	170	225	1	0	146	1	2.8	1	2	1	0
67	1	2	152	212	0	0	150	0	0.8	1	0	3	0
44	1	0	120	169	0	1	144	1	2.8	0	0	1	0
63	1	0	140	187	0	0	144	1	4	2	2	3	0
63	0	0	124	197	0	1	136	1	0	1	0	2	0
59	1	0	164	176	1	0	90	0	1	1	2	1	0
57	0	0	140	241	0	1	123	1	0.2	1	0	3	0
45	1	3	110	264	0	1	132	0	1.2	1	0	3	0
68	1	0	144	193	1	1	141	0	3.4	1	2	3	0
57	1	0	130	131	0	1	115	1	1.2	1	1	3	0
57	0	1	130	236	0	0	174	0	0	1	1	2	0

5.2 Processed Data

Age	Gender	Chest Pain	Resting Blood Pressure	Serum Cholesterol	Resting Electrocardiographic Results	Maximum Heart Rate
35	Female	asymptomatic	138 mm Hg	183 mg/dl	normal	182
42	Female	asymptomatic	102 mm Hg	265 mg/dl	hypertrophy	122
43	Female	asymptomatic	132 mm Hg	341 mg/dl	hypertrophy	136
45	Female	asymptomatic	138 mm Hg	236 mg/dl	hypertrophy	152
46	Female	asymptomatic	138 mm Hg	243 mg/dl	hypertrophy	152
49	Female	asymptomatic	130 mm Hg	269 mg/dl	normal	163
50	Female	asymptomatic	110 mm Hg	254 mg/dl	hypertrophy	159
51	Female	asymptomatic	130 mm Hg	305 mg/dl	normal	142
53	Female	asymptomatic	130 mm Hg	264 mg/dl	hypertrophy	143
53	Female	asymptomatic	138 mm Hg	234 mg/dl	hypertrophy	160
55	Female	asymptomatic	180 mm Hg	327 mg/dl	abnormal ST-T wave	117
55	Female	asymptomatic	128 mm Hg	205 mg/dl	abnormal ST-T wave	130
56	Female	asymptomatic	200 mm Hg	288 mg/dl	hypertrophy	133
56	Female	asymptomatic	134 mm Hg	409 mg/dl	hypertrophy	150
57	Female	asymptomatic	140 mm Hg	241 mg/dl	normal	123
57	Female	asymptomatic	128 mm Hg	303 mg/dl	hypertrophy	159
57	Female	asymptomatic	120 mm Hg	354 mg/dl	normal	163
58	Female	asymptomatic	100 mm Hg	248 mg/dl	hypertrophy	122
58	Female	asymptomatic	130 mm Hg	197 mg/dl	normal	131
58	Female	asymptomatic	170 mm Hg	225 mg/dl	hypertrophy	146
59	Female	asymptomatic	174 mm Hg	249 mg/dl	normal	143
60	Female	asymptomatic	150 mm Hg	258 mg/dl	hypertrophy	157
61	Female	asymptomatic	145 mm Hg	307 mg/dl	hypertrophy	146
61	Female	asymptomatic	130 mm Hg	330 mg/dl	hypertrophy	169
62	Female	asymptomatic	138 mm Hg	294 mg/dl	normal	106
62	Female	asymptomatic	160 mm Hg	164 mg/dl	hypertrophy	145
62	Female	asymptomatic	150 mm Hg	244 mg/dl	normal	154
62	Female	asymptomatic	140 mm Hg	394 mg/dl	hypertrophy	157
62	Female	asymptomatic	140 mm Hg	268 mg/dl	hypertrophy	160
62	Female	asymptomatic	124 mm Hg	209 mg/dl	normal	163
63	Female	asymptomatic	124 mm Hg	197 mg/dl	normal	136
63	Female	asymptomatic	150 mm Hg	407 mg/dl	hypertrophy	154
63	Female	asymptomatic	108 mm Hg	269 mg/dl	normal	169
64	Female	asymptomatic	130 mm Hg	303 mg/dl	normal	122
64	Female	asymptomatic	180 mm Hg	325 mg/dl	normal	154
65	Female	asymptomatic	150 mm Hg	225 mg/dl	hypertrophy	114
66	Female	asymptomatic	178 mm Hg	228 mg/dl	normal	165
67	Female	asymptomatic	106 mm Hg	223 mg/dl	normal	142
71	Female	asymptomatic	112 mm Hg	149 mg/dl	normal	125
37	Female	atypical angina	120 mm Hg	215 mg/dl	normal	170
39	Female	atypical angina	138 mm Hg	220 mg/dl	normal	152
39	Female	atypical angina	94 mm Hg	199 mg/dl	normal	179
41	Female	atypical angina	112 mm Hg	268 mg/dl	hypertrophy	172
42	Female	atypical angina	120 mm Hg	209 mg/dl	normal	173
43	Female	atypical angina	122 mm Hg	213 mg/dl	normal	165
44	Female	atypical angina	118 mm Hg	242 mg/dl	normal	149
44	Female	atypical angina	108 mm Hg	141 mg/dl	normal	175
46	Female	atypical angina	142 mm Hg	177 mg/dl	hypertrophy	160
48	Female	atypical angina	130 mm Hg	275 mg/dl	normal	139
50	Female	atypical angina	120 mm Hg	219 mg/dl	normal	158
51	Female	atypical angina	140 mm Hg	308 mg/dl	hypertrophy	142
51	Female	atypical angina	130 mm Hg	256 mg/dl	hypertrophy	149
51	Female	atypical angina	120 mm Hg	295 mg/dl	hypertrophy	157
52	Female	atypical angina	136 mm Hg	196 mg/dl	hypertrophy	169
53	Female	atypical angina	128 mm Hg	216 mg/dl	hypertrophy	115

54	Female	atypical angina	110 mm Hg	214 mg/dl	normal	158
54	Female	atypical angina	160 mm Hg	201 mg/dl	normal	163
54	Female	atypical angina	108 mm Hg	267 mg/dl	hypertrophy	167
54	Female	atypical angina	135 mm Hg	304 mg/dl	normal	170
58	Female	atypical angina	120 mm Hg	340 mg/dl	normal	172
60	Female	atypical angina	120 mm Hg	178 mg/dl	normal	96
60	Female	atypical angina	102 mm Hg	318 mg/dl	normal	160
62	Female	atypical angina	130 mm Hg	263 mg/dl	normal	97
63	Female	atypical angina	135 mm Hg	252 mg/dl	hypertrophy	172
64	Female	atypical angina	140 mm Hg	313 mg/dl	normal	133
65	Female	atypical angina	155 mm Hg	269 mg/dl	normal	148
65	Female	atypical angina	160 mm Hg	360 mg/dl	hypertrophy	151
65	Female	atypical angina	140 mm Hg	417 mg/dl	hypertrophy	157
66	Female	atypical angina	146 mm Hg	278 mg/dl	hypertrophy	152
67	Female	atypical angina	115 mm Hg	564 mg/dl	hypertrophy	160
67	Female	atypical angina	152 mm Hg	277 mg/dl	normal	172
68	Female	atypical angina	120 mm Hg	211 mg/dl	hypertrophy	115
71	Female	atypical angina	110 mm Hg	265 mg/dl	hypertrophy	130
76	Female	atypical angina	140 mm Hg	197 mg/dl	abnormal ST-T wave	116
58	Female	non-anginal pain	150 mm Hg	283 mg/dl	hypertrophy	162
60	Female	non-anginal pain	150 mm Hg	240 mg/dl	normal	171
66	Female	non-anginal pain	150 mm Hg	226 mg/dl	normal	114
69	Female	non-anginal pain	140 mm Hg	239 mg/dl	normal	151
34	Female	typical angina	118 mm Hg	210 mg/dl	normal	192
41	Female	typical angina	126 mm Hg	306 mg/dl	normal	163
41	Female	typical angina	105 mm Hg	198 mg/dl	normal	168
41	Female	typical angina	130 mm Hg	204 mg/dl	hypertrophy	172
45	Female	typical angina	112 mm Hg	160 mg/dl	normal	138
45	Female	typical angina	130 mm Hg	234 mg/dl	hypertrophy	175
46	Female	typical angina	105 mm Hg	204 mg/dl	normal	172
49	Female	typical angina	134 mm Hg	271 mg/dl	normal	162
50	Female	typical angina	120 mm Hg	244 mg/dl	normal	162
54	Female	typical angina	132 mm Hg	288 mg/dl	hypertrophy	159
55	Female	typical angina	135 mm Hg	250 mg/dl	hypertrophy	161
55	Female	typical angina	132 mm Hg	342 mg/dl	normal	166
56	Female	typical angina	140 mm Hg	294 mg/dl	hypertrophy	153
57	Female	typical angina	130 mm Hg	236 mg/dl	hypertrophy	174
58	Female	typical angina	136 mm Hg	319 mg/dl	hypertrophy	152
63	Female	typical angina	140 mm Hg	195 mg/dl	normal	179
71	Female	typical angina	160 mm Hg	302 mg/dl	normal	162
74	Female	typical angina	120 mm Hg	269 mg/dl	hypertrophy	121
35	Male	asymptomatic	120 mm Hg	198 mg/dl	normal	130
35	Male	asymptomatic	126 mm Hg	282 mg/dl	hypertrophy	156
39	Male	asymptomatic	118 mm Hg	219 mg/dl	normal	140
40	Male	asymptomatic	110 mm Hg	167 mg/dl	hypertrophy	114
40	Male	asymptomatic	152 mm Hg	223 mg/dl	normal	181
41	Male	asymptomatic	110 mm Hg	172 mg/dl	hypertrophy	158
42	Male	asymptomatic	136 mm Hg	315 mg/dl	normal	125
42	Male	asymptomatic	140 mm Hg	226 mg/dl	normal	178
43	Male	asymptomatic	120 mm Hg	177 mg/dl	hypertrophy	120
43	Male	asymptomatic	132 mm Hg	247 mg/dl	hypertrophy	143
43	Male	asymptomatic	110 mm Hg	211 mg/dl	normal	161
43	Male	asymptomatic	150 mm Hg	247 mg/dl	normal	171
43	Male	asymptomatic	115 mm Hg	303 mg/dl	normal	181
44	Male	asymptomatic	120 mm Hg	169 mg/dl	normal	144
44	Male	asymptomatic	112 mm Hg	290 mg/dl	hypertrophy	153

44	Male	asymptomatic	110 mm Hg	197 mg/dl	hypertrophy	177
45	Male	asymptomatic	142 mm Hg	309 mg/dl	hypertrophy	147
45	Male	asymptomatic	104 mm Hg	208 mg/dl	hypertrophy	148
45	Male	asymptomatic	115 mm Hg	260 mg/dl	hypertrophy	185
46	Male	asymptomatic	140 mm Hg	311 mg/dl	normal	120
46	Male	asymptomatic	120 mm Hg	249 mg/dl	hypertrophy	144
47	Male	asymptomatic	110 mm Hg	275 mg/dl	hypertrophy	118
47	Male	asymptomatic	112 mm Hg	204 mg/dl	normal	143
48	Male	asymptomatic	130 mm Hg	256 mg/dl	hypertrophy	150
48	Male	asymptomatic	124 mm Hg	274 mg/dl	hypertrophy	166
48	Male	asymptomatic	122 mm Hg	222 mg/dl	hypertrophy	186
50	Male	asymptomatic	144 mm Hg	200 mg/dl	hypertrophy	126
50	Male	asymptomatic	150 mm Hg	243 mg/dl	hypertrophy	128
51	Male	asymptomatic	140 mm Hg	298 mg/dl	normal	122
51	Male	asymptomatic	140 mm Hg	299 mg/dl	normal	173
51	Male	asymptomatic	140 mm Hg	261 mg/dl	hypertrophy	186
52	Male	asymptomatic	108 mm Hg	233 mg/dl	normal	147
52	Male	asymptomatic	128 mm Hg	204 mg/dl	normal	156
52	Male	asymptomatic	112 mm Hg	230 mg/dl	normal	160
52	Male	asymptomatic	128 mm Hg	255 mg/dl	normal	161
52	Male	asymptomatic	125 mm Hg	212 mg/dl	normal	168
53	Male	asymptomatic	123 mm Hg	282 mg/dl	normal	95
53	Male	asymptomatic	142 mm Hg	226 mg/dl	hypertrophy	111
53	Male	asymptomatic	140 mm Hg	203 mg/dl	hypertrophy	155
54	Male	asymptomatic	110 mm Hg	206 mg/dl	hypertrophy	108
54	Male	asymptomatic	124 mm Hg	266 mg/dl	hypertrophy	109
54	Male	asymptomatic	120 mm Hg	188 mg/dl	normal	113
54	Male	asymptomatic	122 mm Hg	286 mg/dl	hypertrophy	116
54	Male	asymptomatic	110 mm Hg	239 mg/dl	normal	126
54	Male	asymptomatic	140 mm Hg	239 mg/dl	normal	160
55	Male	asymptomatic	140 mm Hg	217 mg/dl	normal	111
55	Male	asymptomatic	132 mm Hg	353 mg/dl	normal	132
55	Male	asymptomatic	160 mm Hg	289 mg/dl	hypertrophy	145
56	Male	asymptomatic	130 mm Hg	283 mg/dl	hypertrophy	103
56	Male	asymptomatic	132 mm Hg	184 mg/dl	hypertrophy	105
56	Male	asymptomatic	125 mm Hg	249 mg/dl	hypertrophy	144
57	Male	asymptomatic	152 mm Hg	274 mg/dl	normal	88
57	Male	asymptomatic	150 mm Hg	276 mg/dl	hypertrophy	112
57	Male	asymptomatic	130 mm Hg	131 mg/dl	normal	115
57	Male	asymptomatic	165 mm Hg	289 mg/dl	hypertrophy	124
57	Male	asymptomatic	110 mm Hg	201 mg/dl	normal	126
57	Male	asymptomatic	110 mm Hg	335 mg/dl	normal	143
57	Male	asymptomatic	140 mm Hg	192 mg/dl	normal	148
57	Male	asymptomatic	132 mm Hg	207 mg/dl	normal	168
58	Male	asymptomatic	146 mm Hg	218 mg/dl	normal	105
58	Male	asymptomatic	150 mm Hg	270 mg/dl	hypertrophy	111
58	Male	asymptomatic	128 mm Hg	259 mg/dl	hypertrophy	130
58	Male	asymptomatic	128 mm Hg	216 mg/dl	hypertrophy	131
58	Male	asymptomatic	114 mm Hg	318 mg/dl	abnormal ST-T wave	140
58	Male	asymptomatic	100 mm Hg	234 mg/dl	normal	156
58	Male	asymptomatic	125 mm Hg	300 mg/dl	hypertrophy	171
59	Male	asymptomatic	164 mm Hg	176 mg/dl	hypertrophy	90
59	Male	asymptomatic	170 mm Hg	326 mg/dl	hypertrophy	140
59	Male	asymptomatic	110 mm Hg	239 mg/dl	hypertrophy	142
59	Male	asymptomatic	135 mm Hg	234 mg/dl	normal	161
59	Male	asymptomatic	140 mm Hg	177 mg/dl	normal	162

59	Male	asymptomatic	138 mm Hg	271 mg/dl	hypertrophy	182
60	Male	asymptomatic	130 mm Hg	206 mg/dl	hypertrophy	132
60	Male	asymptomatic	125 mm Hg	258 mg/dl	hypertrophy	141
60	Male	asymptomatic	145 mm Hg	282 mg/dl	hypertrophy	142
60	Male	asymptomatic	130 mm Hg	253 mg/dl	normal	144
60	Male	asymptomatic	117 mm Hg	230 mg/dl	normal	160
60	Male	asymptomatic	140 mm Hg	293 mg/dl	hypertrophy	170
61	Male	asymptomatic	138 mm Hg	166 mg/dl	hypertrophy	125
61	Male	asymptomatic	140 mm Hg	207 mg/dl	hypertrophy	138
61	Male	asymptomatic	120 mm Hg	260 mg/dl	normal	140
61	Male	asymptomatic	148 mm Hg	203 mg/dl	normal	161
62	Male	asymptomatic	120 mm Hg	267 mg/dl	normal	99
63	Male	asymptomatic	130 mm Hg	330 mg/dl	hypertrophy	132
63	Male	asymptomatic	140 mm Hg	187 mg/dl	hypertrophy	144
63	Male	asymptomatic	130 mm Hg	254 mg/dl	hypertrophy	147
64	Male	asymptomatic	120 mm Hg	246 mg/dl	hypertrophy	96
64	Male	asymptomatic	128 mm Hg	263 mg/dl	normal	105
64	Male	asymptomatic	145 mm Hg	212 mg/dl	hypertrophy	132
65	Male	asymptomatic	135 mm Hg	254 mg/dl	hypertrophy	127
65	Male	asymptomatic	120 mm Hg	177 mg/dl	normal	140
65	Male	asymptomatic	110 mm Hg	248 mg/dl	hypertrophy	158
66	Male	asymptomatic	112 mm Hg	212 mg/dl	hypertrophy	132
66	Male	asymptomatic	160 mm Hg	228 mg/dl	hypertrophy	138
66	Male	asymptomatic	120 mm Hg	302 mg/dl	hypertrophy	151
67	Male	asymptomatic	120 mm Hg	237 mg/dl	normal	71
67	Male	asymptomatic	160 mm Hg	286 mg/dl	hypertrophy	108
67	Male	asymptomatic	100 mm Hg	299 mg/dl	hypertrophy	125
67	Male	asymptomatic	120 mm Hg	229 mg/dl	hypertrophy	129
67	Male	asymptomatic	125 mm Hg	254 mg/dl	normal	163
68	Male	asymptomatic	144 mm Hg	193 mg/dl	normal	141
70	Male	asymptomatic	130 mm Hg	322 mg/dl	hypertrophy	109
70	Male	asymptomatic	145 mm Hg	174 mg/dl	normal	125
77	Male	asymptomatic	125 mm Hg	304 mg/dl	hypertrophy	162
37	Male	atypical angina	130 mm Hg	250 mg/dl	normal	187
38	Male	atypical angina	138 mm Hg	175 mg/dl	normal	173
38	Male	atypical angina	138 mm Hg	175 mg/dl	normal	173
39	Male	atypical angina	140 mm Hg	321 mg/dl	hypertrophy	182
41	Male	atypical angina	130 mm Hg	214 mg/dl	hypertrophy	168
41	Male	atypical angina	112 mm Hg	250 mg/dl	normal	179
42	Male	atypical angina	130 mm Hg	180 mg/dl	normal	150
42	Male	atypical angina	120 mm Hg	240 mg/dl	normal	194
43	Male	atypical angina	130 mm Hg	315 mg/dl	normal	162
44	Male	atypical angina	120 mm Hg	226 mg/dl	normal	169
44	Male	atypical angina	130 mm Hg	233 mg/dl	normal	179
44	Male	atypical angina	140 mm Hg	235 mg/dl	hypertrophy	180
46	Male	atypical angina	150 mm Hg	231 mg/dl	normal	147
47	Male	atypical angina	108 mm Hg	243 mg/dl	normal	152
47	Male	atypical angina	138 mm Hg	257 mg/dl	hypertrophy	156
47	Male	atypical angina	130 mm Hg	253 mg/dl	normal	179
48	Male	atypical angina	124 mm Hg	255 mg/dl	normal	175
49	Male	atypical angina	118 mm Hg	149 mg/dl	hypertrophy	126
49	Male	atypical angina	120 mm Hg	188 mg/dl	normal	139
50	Male	atypical angina	129 mm Hg	196 mg/dl	normal	163
50	Male	atypical angina	140 mm Hg	233 mg/dl	normal	163
51	Male	atypical angina	110 mm Hg	175 mg/dl	normal	123
51	Male	atypical angina	100 mm Hg	222 mg/dl	normal	143

51	Male	atypical angina	94 mm Hg	227 mg/dl	normal	154
51	Male	atypical angina	125 mm Hg	245 mg/dl	hypertrophy	166
52	Male	atypical angina	172 mm Hg	199 mg/dl	normal	162
52	Male	atypical angina	138 mm Hg	223 mg/dl	normal	169
53	Male	atypical angina	130 mm Hg	197 mg/dl	hypertrophy	152
53	Male	atypical angina	130 mm Hg	246 mg/dl	hypertrophy	173
54	Male	atypical angina	120 mm Hg	258 mg/dl	hypertrophy	147
54	Male	atypical angina	125 mm Hg	273 mg/dl	hypertrophy	152
54	Male	atypical angina	150 mm Hg	232 mg/dl	hypertrophy	165
56	Male	atypical angina	130 mm Hg	256 mg/dl	hypertrophy	142
57	Male	atypical angina	128 mm Hg	229 mg/dl	hypertrophy	150
57	Male	atypical angina	150 mm Hg	126 mg/dl	normal	173
57	Male	atypical angina	150 mm Hg	168 mg/dl	normal	174
58	Male	atypical angina	105 mm Hg	240 mg/dl	hypertrophy	154
58	Male	atypical angina	140 mm Hg	211 mg/dl	hypertrophy	165
58	Male	atypical angina	112 mm Hg	230 mg/dl	hypertrophy	165
58	Male	atypical angina	132 mm Hg	224 mg/dl	hypertrophy	173
59	Male	atypical angina	126 mm Hg	218 mg/dl	normal	134
59	Male	atypical angina	150 mm Hg	212 mg/dl	normal	157
60	Male	atypical angina	140 mm Hg	185 mg/dl	hypertrophy	155
61	Male	atypical angina	150 mm Hg	243 mg/dl	normal	137
62	Male	atypical angina	130 mm Hg	231 mg/dl	normal	146
64	Male	atypical angina	125 mm Hg	309 mg/dl	normal	131
64	Male	atypical angina	140 mm Hg	335 mg/dl	normal	158
67	Male	atypical angina	152 mm Hg	212 mg/dl	hypertrophy	150
68	Male	atypical angina	180 mm Hg	274 mg/dl	hypertrophy	150
68	Male	atypical angina	118 mm Hg	277 mg/dl	normal	151
69	Male	atypical angina	140 mm Hg	254 mg/dl	hypertrophy	146
70	Male	atypical angina	160 mm Hg	269 mg/dl	normal	112
34	Male	non-anginal pain	118 mm Hg	182 mg/dl	hypertrophy	174
38	Male	non-anginal pain	120 mm Hg	231 mg/dl	normal	182
40	Male	non-anginal pain	140 mm Hg	199 mg/dl	normal	178
42	Male	non-anginal pain	148 mm Hg	244 mg/dl	hypertrophy	178
45	Male	non-anginal pain	110 mm Hg	264 mg/dl	normal	132
51	Male	non-anginal pain	125 mm Hg	213 mg/dl	hypertrophy	125
52	Male	non-anginal pain	152 mm Hg	298 mg/dl	normal	178
52	Male	non-anginal pain	118 mm Hg	186 mg/dl	hypertrophy	190
56	Male	non-anginal pain	120 mm Hg	193 mg/dl	hypertrophy	162
59	Male	non-anginal pain	160 mm Hg	273 mg/dl	hypertrophy	125
59	Male	non-anginal pain	178 mm Hg	270 mg/dl	hypertrophy	145
59	Male	non-anginal pain	170 mm Hg	288 mg/dl	hypertrophy	159
59	Male	non-anginal pain	134 mm Hg	204 mg/dl	normal	162
61	Male	non-anginal pain	134 mm Hg	234 mg/dl	normal	145
63	Male	non-anginal pain	145 mm Hg	233 mg/dl	hypertrophy	150
64	Male	non-anginal pain	110 mm Hg	211 mg/dl	hypertrophy	144
64	Male	non-anginal pain	170 mm Hg	227 mg/dl	hypertrophy	155
65	Male	non-anginal pain	138 mm Hg	282 mg/dl	hypertrophy	174
69	Male	non-anginal pain	160 mm Hg	234 mg/dl	hypertrophy	131
29	Male	typical angina	130 mm Hg	204 mg/dl	hypertrophy	202
35	Male	typical angina	122 mm Hg	192 mg/dl	normal	174
41	Male	typical angina	135 mm Hg	203 mg/dl	normal	132
41	Male	typical angina	110 mm Hg	235 mg/dl	normal	153
41	Male	typical angina	120 mm Hg	157 mg/dl	normal	182
42	Male	typical angina	120 mm Hg	295 mg/dl	normal	162
44	Male	typical angina	120 mm Hg	220 mg/dl	normal	170
44	Male	typical angina	120 mm Hg	263 mg/dl	normal	173

44	Male	typical angina	130 mm Hg	219 mg/dl	hypertrophy	188
45	Male	typical angina	128 mm Hg	308 mg/dl	hypertrophy	170
46	Male	typical angina	101 mm Hg	197 mg/dl	normal	156
48	Male	typical angina	110 mm Hg	229 mg/dl	normal	168
48	Male	typical angina	130 mm Hg	245 mg/dl	hypertrophy	180
49	Male	typical angina	130 mm Hg	266 mg/dl	normal	171
52	Male	typical angina	134 mm Hg	201 mg/dl	normal	158
52	Male	typical angina	120 mm Hg	325 mg/dl	normal	172
52	Male	typical angina	128 mm Hg	205 mg/dl	normal	184
54	Male	typical angina	108 mm Hg	309 mg/dl	normal	156
54	Male	typical angina	192 mm Hg	283 mg/dl	hypertrophy	195
55	Male	typical angina	130 mm Hg	262 mg/dl	normal	155
56	Male	typical angina	130 mm Hg	221 mg/dl	hypertrophy	163
56	Male	typical angina	120 mm Hg	240 mg/dl	normal	169
56	Male	typical angina	120 mm Hg	236 mg/dl	normal	178
57	Male	typical angina	124 mm Hg	261 mg/dl	normal	141
57	Male	typical angina	154 mm Hg	232 mg/dl	hypertrophy	164
58	Male	typical angina	125 mm Hg	220 mg/dl	normal	144
58	Male	typical angina	120 mm Hg	284 mg/dl	hypertrophy	160
59	Male	typical angina	140 mm Hg	221 mg/dl	normal	164
62	Male	typical angina	120 mm Hg	281 mg/dl	hypertrophy	103
62	Male	typical angina	128 mm Hg	208 mg/dl	hypertrophy	140
66	Male	typical angina	160 mm Hg	246 mg/dl	normal	120
70	Male	typical angina	156 mm Hg	245 mg/dl	hypertrophy	143