



ACADGILD

SESSION 11: Linear Models

PROBLEM STATEMENT

1. Use the link given below and locate the bank marketing dataset.
<https://archive.ics.uci.edu/ml/machine-learning-databases/00222/>

Perform the below operations:

- a) Is there any association between job and default?
- b) Is there any significant difference in duration of last call between? people having housing loan or not?
- c) Is there any association between consumer price index and consumer?
- d) Is the employment variation rate consistent across Job types?
- e) Is the employment variation rate same across Education?
- f) Which group is more confident?

SOLUTION

a. Is there any association between job and default?

The R-script for the given problem is as follows:

```
# Import Bank Marketing Data
library(readr)
bank <- read.csv("F:/ACADGILD - Online Course/1. DATA SETS/bank-additional.csv ", sep=";")
View(bank)
dim(bank)
str(bank)
```

#a. Is there any association between job and default?

```
chisq.test(bank$job, bank$default)
```

#OR

```
with(bank, chisq.test( job, default))
with(bank, table( job, default) )
with(bank, prop.table(table( job, default)))
```

The output of the R-Script (from Console window) is given as follows:

```
# Import Bank > # Import BankMarketing Data
```

```
> library(readr)
> bank <- read.csv("F:/ACADGILD - Online Course/1. DATA SETS/bank-
additional.csv ", sep=";")
> View(bank)
```

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins Project: (None)

Assignment-11.2.R* bank

	age	job	marital	education	default	housing	loan	contact	month	day_of_week	duration	campaign	pdays	previous	outcome	emp.var.rate	cons.price.idx
1	56	housemaid	married	basic.4y	no	no	no	telephone	may	mon	261	1	999	0	nonexistent	1.1	93.
2	57	services	married	high.school		no	no	telephone	may	mon	149	1	999	0	nonexistent	1.1	93.
3	37	services	married	high.school	no	yes	no	telephone	may	mon	226	1	999	0	nonexistent	1.1	93.
4	40	admin.	married	basic.6y	no	no	no	telephone	may	mon	151	1	999	0	nonexistent	1.1	93.
5	56	services	married	high.school	no	no	yes	telephone	may	mon	307	1	999	0	nonexistent	1.1	93.
6	45	services	married	basic.9y		no	no	telephone	may	mon	198	1	999	0	nonexistent	1.1	93.
7	59	admin.	married	professional.course	no	no	no	telephone	may	mon	139	1	999	0	nonexistent	1.1	93.
8	41	blue-collar	married			no	no	telephone	may	mon	217	1	999	0	nonexistent	1.1	93.
9	24	technician	single	professional.course	no	yes	no	telephone	may	mon	380	1	999	0	nonexistent	1.1	93.
10	25	services	single	high.school	no	yes	no	telephone	may	mon	50	1	999	0	nonexistent	1.1	93.
11	41	blue-collar	married			no	no	telephone	may	mon	55	1	999	0	nonexistent	1.1	93.
12	25	services	single	high.school	no	yes	no	telephone	may	mon	222	1	999	0	nonexistent	1.1	93.
13	29	blue-collar	single	high.school	no	no	yes	telephone	may	mon	137	1	999	0	nonexistent	1.1	93.
14	57	housemaid	divorced	basic.4y	no	yes	no	telephone	may	mon	293	1	999	0	nonexistent	1.1	93.
15	35	blue-collar	married	basic.6y	no	yes	no	telephone	may	mon	146	1	999	0	nonexistent	1.1	93.
16	54	retired	married	basic.9y		yes	yes	telephone	may	mon	174	1	999	0	nonexistent	1.1	93.
17	35	blue-collar	married	basic.6y	no	yes	no	telephone	may	mon	312	1	999	0	nonexistent	1.1	93.
18	46	blue-collar	married	basic.6y		yes	yes	telephone	may	mon	440	1	999	0	nonexistent	1.1	93.
19	50	blue-collar	married	basic.9y	no	yes	yes	telephone	may	mon	353	1	999	0	nonexistent	1.1	93.
20	39	management	single	basic.9y		no	no	telephone	may	mon	195	1	999	0	nonexistent	1.1	93.
21	30	unemployed	married	high.school	no	no	no	telephone	may	mon	38	1	999	0	nonexistent	1.1	93.
22	55	blue-collar	married	basic.4y		yes	no	telephone	may	mon	262	1	999	0	nonexistent	1.1	93.

Showing 1 to 23 of 41,188 entries

Console

```
> dim(bank)
[1] 4119 21
> str(bank)
'data.frame': 4119 obs. of 21 variables:
 $ age      : int 30 39 25 38 47 32 32 41 31 35 ...
 $ job      : Factor w/ 12 levels "admin.", "blue-collar",...: 2 8 8 8 1 8
1 3 8 2 ...
 $ marital  : Factor w/ 4 levels "divorced", "married",...: 2 3 2 2 2 3 3
2 1 2 ...
 $ education : Factor w/ 8 levels "basic.4y", "basic.6y",...: 3 4 4 3 7 7 7
7 6 3 ...
 $ default  : Factor w/ 3 levels "no", "unknown",...: 1 1 1 1 1 1 1 2 1 2
...
 $ housing  : Factor w/ 3 levels "no", "unknown",...: 3 1 3 2 3 1 3 3 1 1
...
 $ loan     : Factor w/ 3 levels "no", "unknown",...: 1 1 1 2 1 1 1 1 1 1
...
 $ contact  : Factor w/ 2 levels "cellular", "telephone": 1 2 2 2 1 1 1 1
1 2 ...
 $ month    : Factor w/ 10 levels "apr", "aug", "dec",...: 7 7 5 5 8 10 10
```

```

8 8 7 ...
$ day_of_week : Factor w/ 5 levels "fri","mon","thu",...: 1 1 5 1 2 3 2 2 4
3 ...
$ duration : int 487 346 227 17 58 128 290 44 68 170 ...
$ campaign : int 2 4 1 3 1 3 4 2 1 1 ...
$ pdays : int 999 999 999 999 999 999 999 999 999 999 ...
$ previous : int 0 0 0 0 0 2 0 0 1 0 ...
$ poutcome : Factor w/ 3 levels "failure","nonexistent",...: 2 2 2 2 2 1
2 2 1 2 ...
$ emp.var.rate : num -1.8 1.1 1.4 1.4 -0.1 -1.1 -1.1 -0.1 -0.1 1.1 ...
$ cons.price.idx: num 92.9 94 94.5 94.5 93.2 ...
$ cons.conf.idx : num -46.2 -36.4 -41.8 -41.8 -42 -37.5 -37.5 -42 -42 -36.4
...
$ euribor3m : num 1.31 4.86 4.96 4.96 4.19 ...
$ nr.employed : num 5099 5191 5228 5228 5196 ...
$ y : Factor w/ 2 levels "no","yes": 1 1 1 1 1 1 1 1 1 1 ...

```

```
> chisq.test(bank$job, bank$default)
```

Pearson's Chi-squared test

```

data: bank$job and bank$default
X-squared = 224.29, df = 22, p-value < 2.2e-16

```

```
> with(bank, chisq.test( job, default))
```

Pearson's Chi-squared test

```

data: job and default
X-squared = 224.29, df = 22, p-value < 2.2e-16

```

```
> with(bank, table( job, default) )
```

	default		
job	no	unknown	yes
admin.	889	123	0
blue-collar	599	285	0
entrepreneur	113	35	0
housemaid	79	31	0
management	280	44	0
retired	126	40	0
self-employed	134	25	0
services	306	87	0
student	70	12	0
technician	606	85	0
unemployed	92	18	1
unknown	21	18	0

```
> with(bank, prop.table(table( job,default)))
```

	default		
job	no	unknown	yes
admin.	0.2158290847	0.0298616169	0.0000000000
blue-collar	0.1454236465	0.0691915513	0.0000000000
entrepreneur	0.0274338432	0.0084972081	0.0000000000
housemaid	0.0191794125	0.0075260986	0.0000000000
management	0.0679776645	0.0106822044	0.0000000000
retired	0.0305899490	0.0097110949	0.0000000000
self-employed	0.0325321680	0.0060694343	0.0000000000
services	0.0742898762	0.0211216315	0.0000000000
student	0.0169944161	0.0029133285	0.0000000000
technician	0.1471230881	0.0206360767	0.0000000000
unemployed	0.0223355183	0.0043699927	0.0002427774
unknown	0.0050983248	0.0043699927	0.0000000000

Conclusion/Interpretation:

Ho : There is NO association between Job and default.

Since the p-value is $2.2e-16$ is less than the cut-off value of 0.05, we can reject the null hypothesis in favor of alternative hypothesis and conclude, that the variables, job & default are dependent to each other.

b. Is there any significant difference in duration of last call between? people having housing loan or not?

The R-script for the given problem is as follows:

```
with(bank, chisq.test(duration,housing))  
with(bank, table( duration,housing) )
```

The output of the R-Script (from Console window) is given as follows:

```
> with(bank, chisq.test(duration,housing))  
  
Pearson's Chi-squared test  
  
data: duration and housing x-squared = 1616,  
df = 1654, p-value = 0.7433  
  
> with(bank, table( duration,housing) )  
      housing  
duration no unknown yes  
0         0         0  1  
4         0         0  1  
5         3         0  1  
6         2         0  3  
7         2         0  2  
8         0         0  6  
9         6         0  3  
10        4         0  6  
11        3         0  5  
12        4         0  2  
13        2         0  4  
14        3         0  3  
15        3         0  3  
16        4         0  7  
17        5         1  4  
18        1         0  3  
19        3         0  6  
20        5         0  2  
21        4         0  3  
22        5         0  4  
23        2         1  5  
24        4         0  3  
25        1         0  4  
26        3         0  6  
27        4         0  5  
28        1         0  2
```

29	2	0	2
30	1	1	2
31	3	0	5
32	0	0	6
33	0	0	3
34	3	0	3
35	3	2	4
36	3	0	6
37	2	1	3
38	2	0	6
39	3	0	4
40	4	0	2
41	3	0	2
42	5	0	5
43	1	0	8
44	2	0	6
45	1	0	3
46	2	0	1
47	1	0	5
48	1	0	4
49	9	0	1
50	6	0	2
51	7	1	4
52	2	0	3
53	2	0	5
54	7	0	5
55	6	0	6
56	4	1	3
57	4	0	9
58	3	0	7
59	6	1	7
60	5	0	2
61	3	1	6
62	4	0	6
63	4	0	8
64	7	0	6
65	6	0	2
66	6	0	3
67	6	1	7
68	8	0	6
69	9	0	8
70	8	0	5
71	7	0	6
72	6	1	6
73	10	0	12
74	7	0	6
75	5	0	8
76	8	0	5
77	8	1	15
78	6	0	7
79	8	0	2
80	7	0	5
81	10	2	9
82	4	0	12
83	11	0	9
84	10	0	3
85	8	1	7
86	5	0	6
87	7	1	10
88	6	0	13
89	8	0	5
90	8	1	11

91	12	0	2
92	7	0	5
93	6	1	7
94	7	0	8
95	9	2	6
96	8	0	7
97	5	0	8
98	5	0	7
99	6	0	7
100	5	1	6
101	6	1	9
102	8	0	9
103	11	0	7
104	3	1	9
105	2	0	8
106	3	0	8
107	5	2	11
108	3	1	4
109	5	0	7
110	2	0	4
111	7	0	10
112	9	0	14
113	5	0	15
114	10	0	9
115	6	0	7
116	3	1	5
117	5	0	5
118	3	0	7
119	8	0	5
120	3	0	5
121	8	0	8
122	7	1	12
123	5	2	7
124	9	0	4
125	7	0	6
126	10	1	5
127	8	1	5
128	8	0	8
129	5	0	6
130	8	0	9
131	9	1	9
132	6	0	5
133	4	1	6
134	7	0	5
135	7	2	10
136	8	1	7
137	4	0	9
138	3	0	4
139	8	0	9
140	5	0	6
141	7	1	5
142	6	0	8
143	3	1	9
144	6	1	5
145	6	0	14
146	8	1	7
147	7	3	7
148	6	0	7
149	5	0	6
150	1	0	10
151	9	0	4
152	4	0	7

153	4	2	5
154	5	1	6
155	8	1	9
156	2	1	9
157	9	0	6
158	4	0	7
159	6	0	12
160	5	0	12
161	8	0	9
162	6	0	4
163	5	0	7
164	7	1	8
165	6	0	7
166	7	0	9
167	2	0	9
168	6	0	9
169	2	3	4
170	5	0	6
171	7	1	5
172	4	0	6
173	3	1	9
174	4	0	3
175	6	1	7
176	2	0	6
177	5	0	4
178	6	0	5
179	4	0	2
180	9	0	8
181	6	0	10
182	4	0	7
183	6	0	7
184	4	0	11
185	5	0	3
186	3	0	4
187	6	0	5
188	5	0	7
189	3	0	3
190	4	0	3
191	5	0	5
192	4	0	4
193	5	0	8
194	2	0	3
195	3	0	6
196	2	0	5
197	6	0	2
198	5	1	5
199	4	1	3
200	7	0	7
201	6	0	8
202	4	1	5
203	5	0	5
204	9	1	7
205	0	0	2
206	8	0	6
207	4	0	9
208	3	0	5
209	4	0	4
210	0	0	7
211	5	0	8
212	4	0	8
213	5	0	3
214	5	0	3

215	3	1	9
216	2	0	2
217	7	0	2
218	7	0	4
219	5	0	10
220	2	0	1
221	4	1	5
222	4	1	4
223	6	0	3
224	4	0	6
225	4	0	8
226	2	0	9
227	2	1	4
228	5	1	5
229	0	1	3
230	4	0	5
231	3	0	8
232	5	0	7
233	1	0	6
234	4	1	5
235	4	0	0
236	2	0	5
237	1	0	2
238	4	0	3
239	4	0	5
240	2	0	4
241	4	0	3
242	2	0	2
243	3	0	4
244	5	0	5
245	6	1	7
246	5	1	5
247	4	0	9
248	2	0	3
249	1	0	6
250	2	0	6
251	3	0	2
252	4	0	9
253	4	0	2
254	0	0	3
255	1	0	4
256	3	0	3
257	7	0	3
258	8	0	5
259	8	0	5
260	2	0	3
261	4	0	3
262	4	1	3
263	4	0	4
264	4	0	4
265	3	0	4
266	2	0	6
267	1	0	5
268	4	0	3
269	1	0	3
270	3	1	2
271	2	1	3
272	4	1	2
273	2	0	3
274	1	0	4
275	3	0	3
276	3	1	0

277	0	0	2
278	4	0	1
279	2	0	2
280	3	0	3
281	4	0	7
282	1	0	1
283	1	0	0
284	3	0	2
285	3	0	0
286	5	0	5
287	4	0	1
288	2	0	5
289	4	0	1
290	2	0	2
291	2	0	3
292	3	0	2
293	3	0	4
294	2	0	3
295	5	0	1
296	5	0	1
297	2	0	3
298	2	0	2
299	3	0	0
300	2	0	4
301	4	0	2
302	2	0	1
303	0	0	2
304	2	0	4
305	1	0	4
306	1	0	0
307	2	0	2
308	1	0	3
309	1	1	4
310	2	0	2
311	1	1	2
312	1	0	2
313	4	1	3
314	2	0	5
315	3	0	0
316	5	0	3
317	4	0	0
318	2	1	3
319	2	1	0
320	0	0	7
321	2	0	2
322	3	0	7
323	1	0	1
324	0	0	2
325	0	0	1
326	1	0	5
327	2	0	1
328	2	0	2
329	5	0	2
330	1	0	2
331	2	1	2
332	4	0	1
333	2	1	1
334	1	0	3
335	2	0	1

[reached getopt("max.print") -- omitted 495 rows]

c. Is there any association between consumer price index and consumer?

The R-script for the given problem is as follows:

```
chisq.test(bank$cons.price.idx, bank$cons.conf.idx)
```

#OR

```
with(bank, chisq.test(cons.price.idx, cons.conf.idx))  
with(bank, table(cons.price.idx, cons.conf.idx))
```

The output of the R-Script (from Console window) is given as follows:

```
> chisq.test(bank$cons.price.idx, bank$cons.conf.idx)  
  
Pearson's Chi-squared test  
  
data: bank$cons.price.idx and bank$cons.conf.idx  
X-squared = 102980, df = 625, p-value < 2.2e-16  
  
> #OR  
>  
> with(bank, chisq.test(cons.price.idx, cons.conf.idx))  
  
Pearson's Chi-squared test  
  
data: cons.price.idx and cons.conf.idx X-  
squared = 102980, df = 625, p-value < 2.2e-16  
  
> with(bank, table(cons.price.idx, cons.conf.idx))  
cons.conf.idx  
cons.price.idx -50.8 -50 -49.5 -47.1 -46.2 -45.9 -42.7 -42 -41.8 -40.8  
92.201 0 0 0 0 0 0 0 0 0  
92.379 0 0 0 0 0 0 0 0 0  
92.431 0 0 0 0 0 0 0 0 0  
92.469 0 0 0 0 0 0 0 0 0  
92.649 0 0 0 0 0 0 0 0 0  
92.713 0 0 0 0 0 0 0 0 0  
92.756 0 0 0 0 0 1 0 0 0  
92.843 0 25 0 0 0 0 0 0 0  
92.893 0 0 0 0 597 0 0 0 0  
92.963 0 0 0 0 0 0 0 0 75  
93.075 0 0 0 201 0 0 0 0 0  
93.2 0 0 0 0 0 0 0 386 0  
93.369 0 0 0 0 0 0 0 0 0  
93.444 0 0 0 0 0 0 0 0 0  
93.749 0 0 0 0 0 0 0 0 0  
93.798 0 0 0 0 0 0 0 0 0  
93.876 0 0 0 0 0 0 0 0 0  
93.918 0 0 0 0 0 0 667 0 0  
93.994 0 0 0 0 0 0 0 0 0  
94.027 0 0 0 0 0 0 0 0 0  
94.055 0 0 0 0 0 0 0 0 0
```

[illegible]

	cons.conf.idx					
cons.price.idx	-33.6	-33	-31.4	-30.1	-29.8	-26.9
92.201	0	0	75	0	0	0
92.379	0	0	0	0	25	0
92.431	0	0	0	0	0	43
92.469	14	0	0	0	0	0
92.649	0	0	0	36	0	0
92.713	0	21	0	0	0	0
92.756	0	0	0	0	0	0
92.843	0	0	0	0	0	0
92.893	0	0	0	0	0	0
92.963	0	0	0	0	0	0
93.075	0	0	0	0	0	0
93.2	0	0	0	0	0	0
93.369	0	0	0	0	0	0
93.444	0	0	0	0	0	0
93.749	0	0	0	0	0	0
93.798	0	0	0	0	0	0
93.876	0	0	0	0	0	0
93.918	0	0	0	0	0	0
93.994	0	0	0	0	0	0
94.027	0	0	0	0	0	0
94.055	0	0	0	0	0	0
94.199	0	0	0	0	0	0
94.215	0	0	0	0	0	0
94.465	0	0	0	0	0	0
94.601	0	0	0	0	0	0
94.767	0	0	0	0	0	0

Conclusion/Interpretation:

Ho : There is NO association between Job and default.

Since the p-value is 2.2e-16 is less than the cut-off value of 0.05, we can reject the null hypothesis in favor of alternative hypothesis and conclude, that the variables, consumer price index and consumer are dependent to each other.

d. Is the employment variation rate consistent across Job types?

The R-script for the given problem is as follows:

```
chisq.test(bank$job, bank$emp.var.rate)
#OR
with(bank, chisq.test(job, emp.var.rate))
with(bank, table(job, emp.var.rate))
```

The output of the R-Script (from Console window) is given as follows:

```
> chisq.test(bank$job, bank$emp.var.rate)
```

Pearson's Chi-squared test

data: bank\$job and bank\$emp.var.rate x-
squared = 512.04, df = 99, p-value < 2.2e-16

```
> with(bank, chisq.test( job,emp.var.rate))

Pearson's Chi-squared test

data:  job and emp.var.rate
X-squared = 512.04, df = 99, p-value < 2.2e-16
```

```
> with(bank, table( job,emp.var.rate) )
```

job	emp.var.rate	-3.4	-3	-2.9	-1.8	-1.7	-1.1	-0.2	-0.1	1.1	1.4
admin.		33	4	52	199	24	23	0	92	161	424
blue-collar		8	1	3	246	5	8	1	59	203	350
entrepreneur		2	0	2	26	1	1	0	34	34	48
housemaid		4	1	5	9	1	4	0	10	17	59
management		6	3	15	71	5	5	0	62	50	107
retired		14	3	18	28	11	10	0	11	19	52
self-employed		4	2	6	30	4	2	0	21	34	56
services		1	1	14	112	6	7	0	23	84	145
student		8	1	12	18	12	6	0	4	8	13
technician		18	1	27	122	13	13	0	59	123	315
unemployed		5	3	6	19	4	4	0	17	13	40
unknown		1	1	4	3	1	0	0	0	12	17

e. Is the employment variation rate same across Education?

The R-script for the given problem is as follows:

```
with(bank, chisq.test( education,emp.var.rate))
with(bank, table( education, emp.var.rate) )
```

The output of the R-Script (from Console window) is given as follows:

```
> with(bank, chisq.test( education,emp.var.rate))

Pearson's Chi-squared test

data:  education and emp.var.rate X-squared =
193.46, df = 63, p-value = 3.5e-15

> with(bank, table( education, emp.var.rate) )
```

education	emp.var.rate	-3.4	-3	-2.9	-1.8	-1.7	-1.1	-0.2	-0.1	1.1	1.4
basic.4y		13	2	7	83	6	8	0	28	93	189
basic.6y		1	0	2	59	1	2	0	20	57	86
basic.9y		8	2	4	152	5	4	0	56	127	216
high.school		23	4	34	231	19	18	1	83	161	347
illiterate		0	0	1	0	0	0	0	0	0	0
professional.course		15	2	22	97	12	15	0	46	106	220
university.degree		40	9	80	230	37	31	0	150	177	510
unknown		4	2	14	31	7	5	0	9	37	58

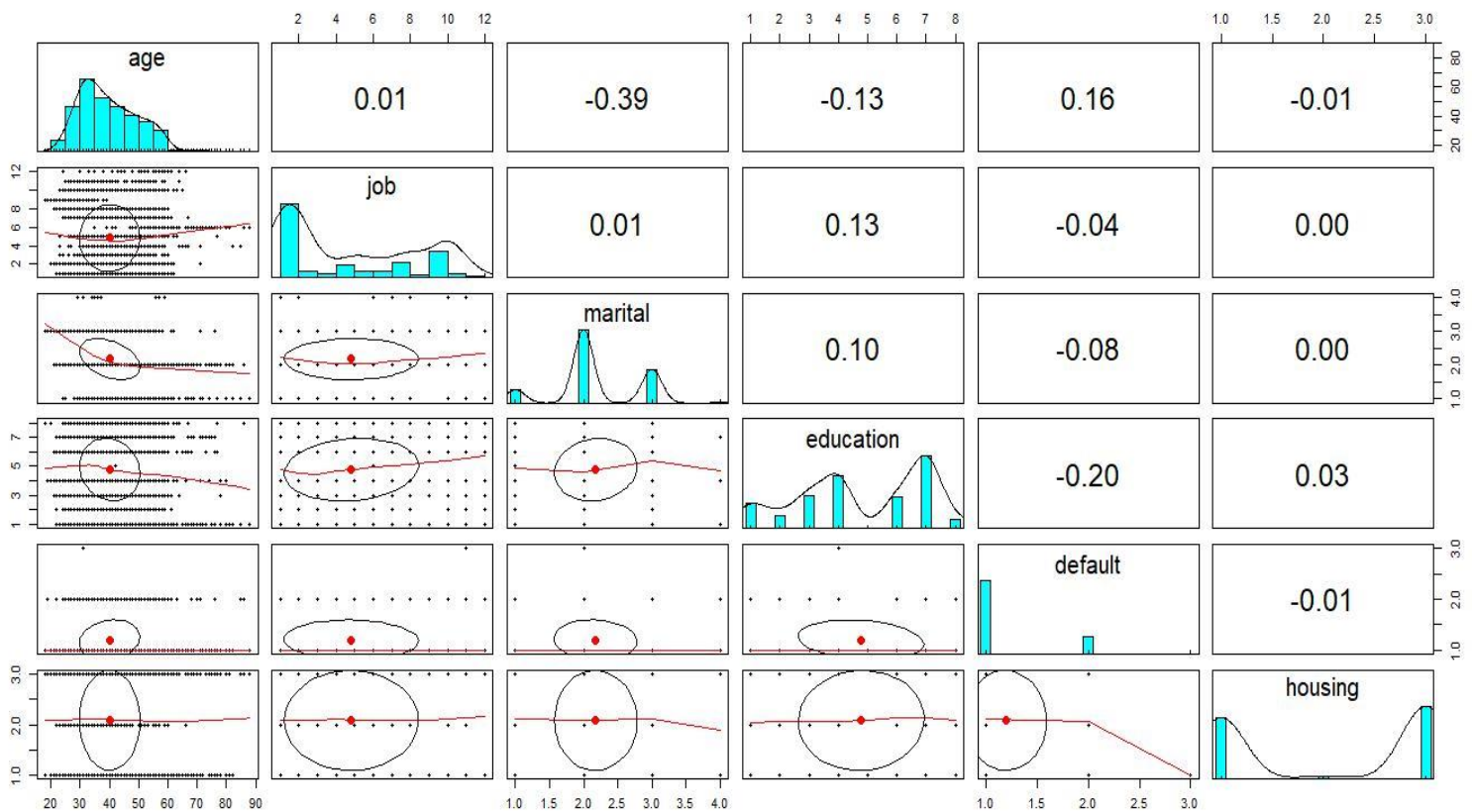
f. Which group is more confident?

The R-script for the given problem is as follows:

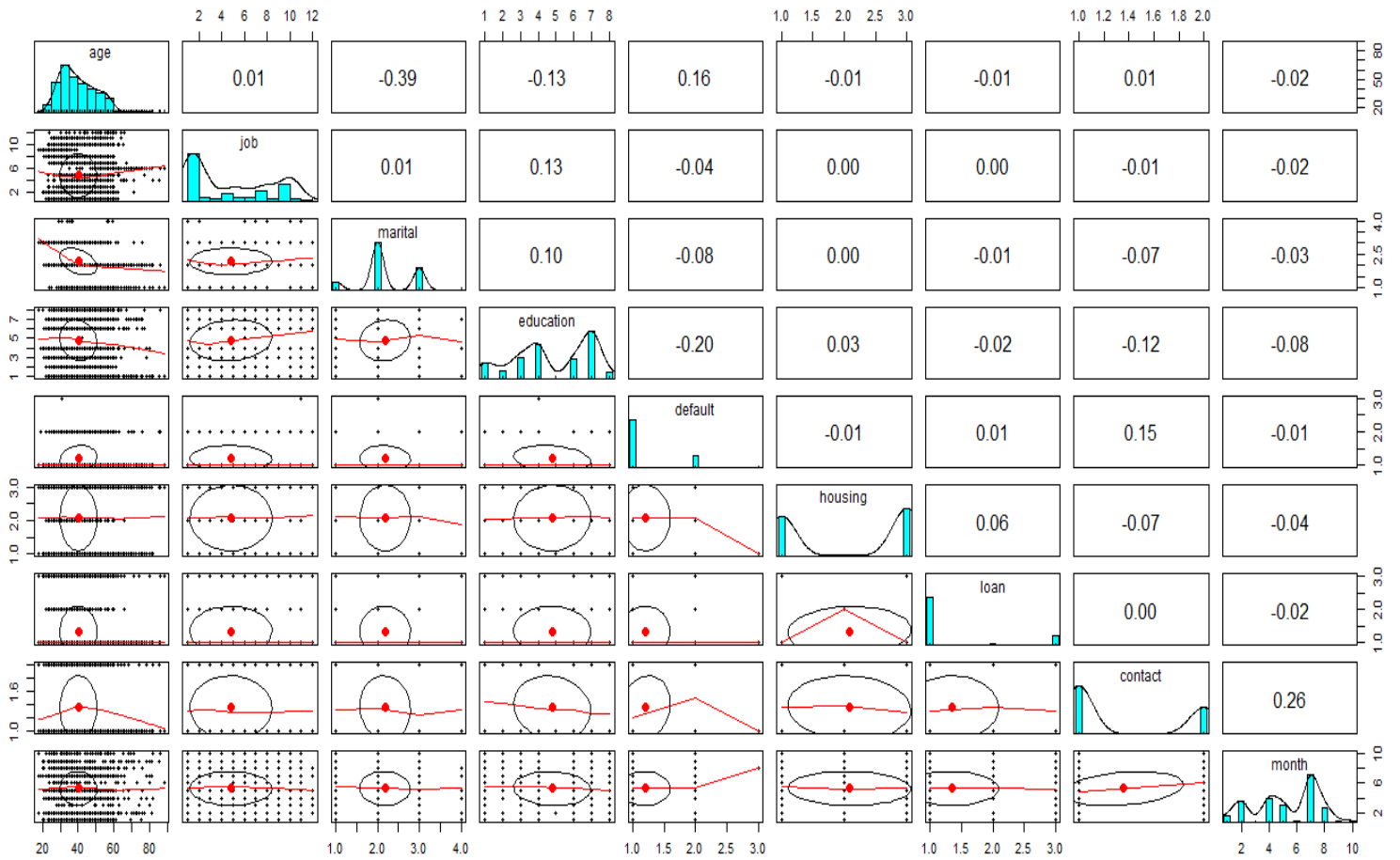
```
library(psych)
pairs.panels(bank[,1:6])
pairs.panels(bank[,1:9])
pairs.panels(bank[,1:14])
summary(bank)
```

The output of the R-Script (from Console window) is given as follows:

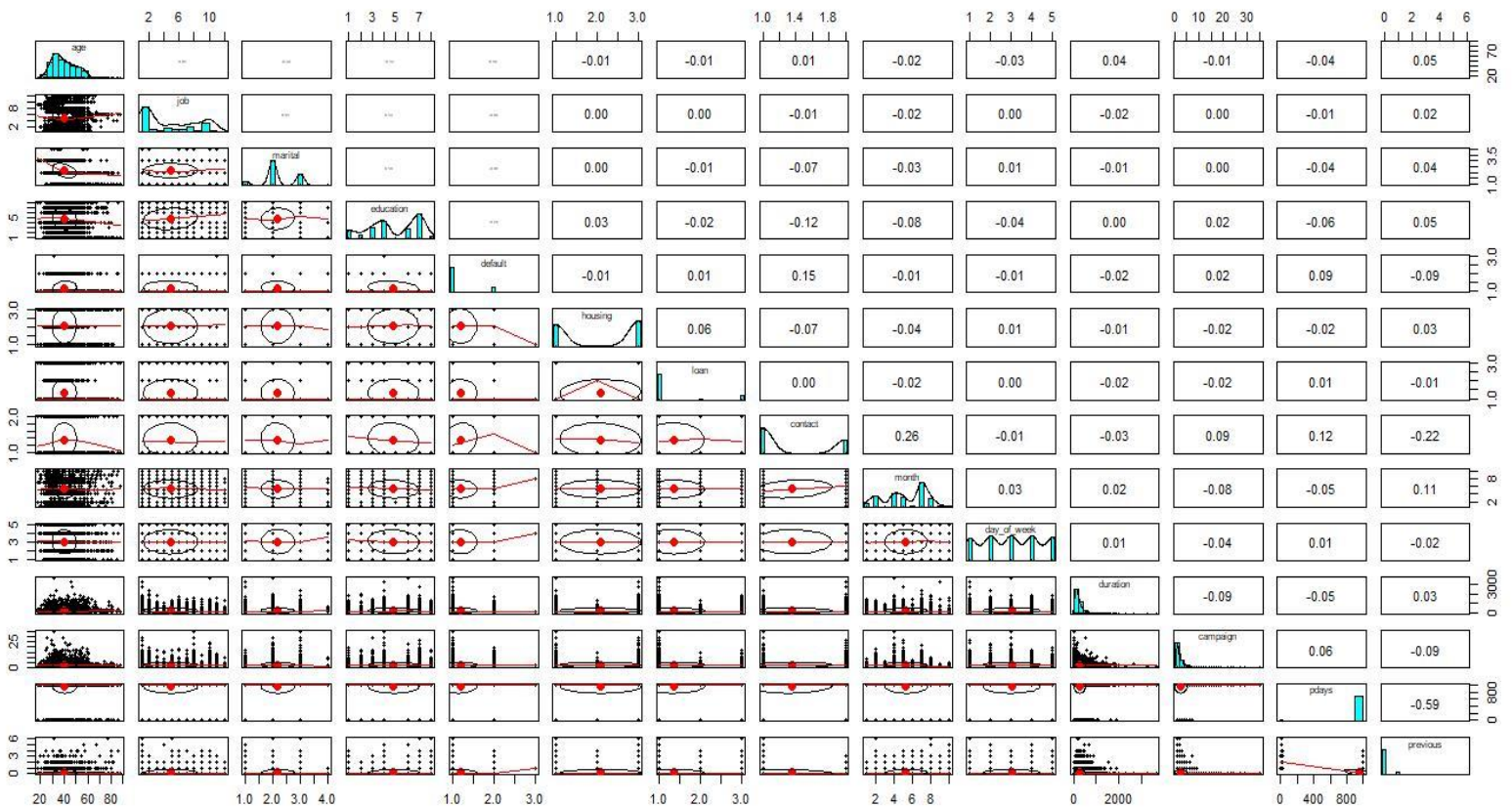
```
> library(psych)
> pairs.panels(bank[,1:6])
```



```
> pairs.panels(bank[,1:9])
```



```
> pairs.panels(bank[,1:14])
```



> summary(bank)

age		job		marital			
Min.	:18.00	admin.	:1012	divorced:	446		
1st Qu.:	:32.00	blue-collar:	884	married	:2509		
Median	:38.00	technician	: 691	single	:1153		
Mean	:40.11	services	: 393	unknown	: 11		
3rd Qu.:	:47.00	management	: 324				
Max.	:88.00	retired	: 166				
		(Other)	: 649				
education		default		housing			
university.degree	:1264	no	:3315	no	:1839		
high.school	: 921	unknown:	803	unknown:	105		
basic.9y	: 574	yes	: 1	yes	:2175		
professional.course:	535						
basic.4y	: 429						
basic.6y	: 228						
(Other)	: 168						
loan		contact		month		day_of_week	
no	:3349	cellular	:2652	may	:1378	fri:	768
unknown:	105	telephone:	1467	jul	: 711	mon:	855
yes	: 665			aug	: 636	thu:	860
				jun	: 530	tue:	841
				nov	: 446	wed:	795
				apr	: 215		
				(Other):	203		
duration		campaign		pdays			
Min.	: 0.0	Min.	: 1.000	Min.	: 0.0		
1st Qu.:	103.0	1st Qu.:	1.000	1st Qu.:	999.0		
Median	: 181.0	Median	: 2.000	Median	:999.0		
Mean	: 256.8	Mean	: 2.537	Mean	:960.4		
3rd Qu.:	317.0	3rd Qu.:	3.000	3rd Qu.:	999.0		
Max.	:3643.0	Max.	:35.000	Max.	:999.0		
previous		poutcome		emp.var.rate			
Min.	:0.0000	failure	: 454	Min.	: -3.40000		
1st Qu.:	0.0000	nonexistent:	3523	1st Qu.:	: -1.80000		
Median	:0.0000	success	: 142	Median	: 1.10000		
Mean	:0.1903			Mean	: 0.08497		
3rd Qu.:	0.0000			3rd Qu.:	: 1.40000		
Max.	:6.0000			Max.	: 1.40000		
cons.price.idx		cons.conf.idx		euribor3m		nr.employed	
Min.	:92.20	Min.	: -50.8	Min.	:0.635	Min.	:4964
1st Qu.:	93.08	1st Qu.:	: -42.7	1st Qu.:	:1.334	1st Qu.:	5099
Median	:93.75	Median	: -41.8	Median	:4.857	Median	:5191
Mean	:93.58	Mean	: -40.5	Mean	:3.621	Mean	:5166
3rd Qu.:	93.99	3rd Qu.:	: -36.4	3rd Qu.:	:4.961	3rd Qu.:	5228
Max.	:94.77	Max.	: -26.9	Max.	:5.045	Max.	:5228
y							
no	:3668						
yes:	451						