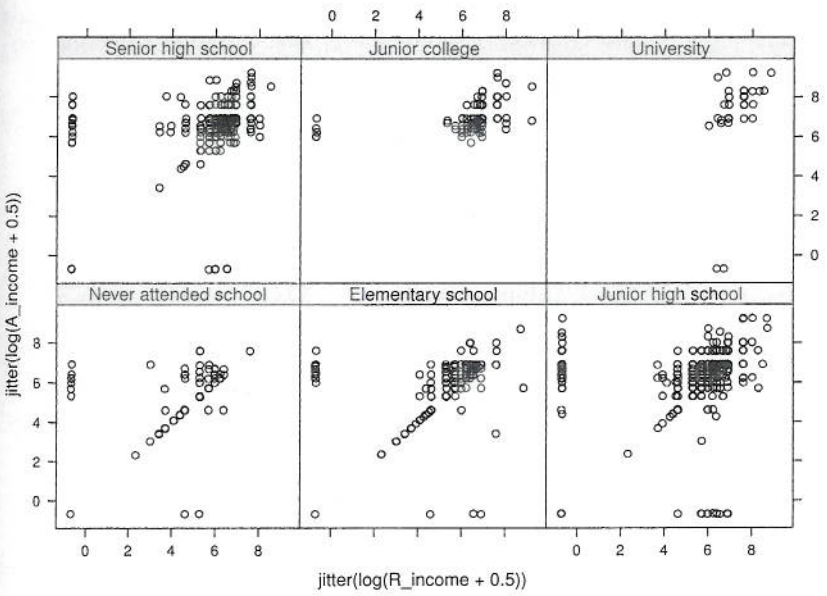
```
R> xyplot(jitter(log(A_income + 0.5)) ~
+         jitter(log(R_income + 0.5)) | R_edu, data = CHFLS)
```



Exercises

Ex. 2.1 The data in Table 2.3 are part of a data set collected from a survey of household expenditure and give the expenditure of 20 single men and 20 single women on four commodity groups. The units of expenditure are Hong Kong dollars, and the four commodity groups are

`housing`: housing, including fuel and light,

`food`: foodstuffs, including alcohol and tobacco,

`goods`: other goods, including clothing, footwear and durable goods,

`services`: services, including transport and vehicles.

The aim of the survey was to investigate how the division of household expenditure between the four commodity groups depends on total expenditure and to find out whether this relationship differs for men and women. Use appropriate graphical methods to answer these questions and state your conclusions.

Table 2.3: `household` data. Household expenditure for single men and women.

housing	food	goods	service	gender
820	114	183	154	female
184	74	6	20	female
921	66	1686	455	female
488	80	103	115	female
721	83	176	104	female
614	55	441	193	female
801	56	357	214	female
396	59	61	80	female
864	65	1618	352	female
845	64	1935	414	female
404	97	33	47	female
781	47	1906	452	female
457	103	136	108	female
1029	71	244	189	female
1047	90	653	298	female
552	91	185	158	female
718	104	583	304	female
495	114	65	74	female
382	77	230	147	female
1090	59	313	177	female
497	591	153	291	male
839	942	302	365	male
798	1308	668	584	male
892	842	287	395	male
1585	781	2476	1740	male
755	764	428	438	male
388	655	153	233	male
617	879	757	719	male
248	438	22	65	male
1641	440	6471	2063	male
1180	1243	768	813	male
619	684	99	204	male
253	422	15	48	male
661	739	71	188	male
1981	869	1489	1032	male
1746	746	2662	1594	male
1865	915	5184	1767	male
238	522	29	75	male
1199	1095	261	344	male
1524	964	1739	1410	male

Ex. 2.2 Mortality rates
groups and a number
by-side box plots for t
what the graphic tells

Table 2.4: `suici`
male s

	A2
Canada	
Israel	
Japan	
Austria	
France	
Germany	
Hungary	
Italy	
Netherlands	
Poland	
Spain	
Sweden	
Switzerland	
UK	
USA	

Ex. 2.3 The data set sh
for ten states in the US

`Population`: populati
`Income`: average per c
`Illiteracy`: illiteracy
`Life.Expectancy`: life
`Homicide`: homicide ra
`Graduates`: percentag
`Freezing`: average nu

With these data

1. Construct a scatterpl
name (using function
2. Construct a plot of
average per capita in

xpenditure for single

ce	gender
54	female
20	female
55	female
15	female
04	female
93	female
14	female
80	female
52	female
14	female
47	female
52	female
08	female
89	female
98	female
58	female
04	female
74	female
47	female
77	female
91	male
65	male
84	male
95	male
40	male
38	male
33	male
19	male
65	male
063	male
313	male
204	male
48	male
188	male
032	male
594	male
767	male
75	male
344	male
410	male

Ex. 2.2 Mortality rates per 100,000 from male suicides for a number of age groups and a number of countries are given in Table 2.4. Construct side-by-side box plots for the data from different age groups, and comment on what the graphic tells us about the data.

Table 2.4: `suicides2` data. Mortality rates per 100,000 from male suicides.

	A25.34	A35.44	A45.54	A55.64	A65.74
Canada	22	27	31	34	24
Israel	9	19	10	14	27
Japan	22	19	21	31	49
Austria	29	40	52	53	69
France	16	25	36	47	56
Germany	28	35	41	49	52
Hungary	48	65	84	81	107
Italy	7	8	11	18	27
Netherlands	8	11	18	20	28
Poland	26	29	36	32	28
Spain	4	7	10	16	22
Sweden	28	41	46	51	35
Switzerland	22	34	41	50	51
UK	10	13	15	17	22
USA	20	22	28	33	37

Ex. 2.3 The data set shown in Table 2.5 contains values of seven variables for ten states in the US. The seven variables are

`Population`: population size divided by 1000,
`Income`: average per capita income,
`Illiteracy`: illiteracy rate (% population),
`Life.Expectancy`: life expectancy (years),
`Homicide`: homicide rate (per 1000),
`Graduates`: percentage of high school graduates,
`Freezing`: average number of days per below freezing.

With these data

1. Construct a scatterplot matrix of the data labelling the points by state name (using function `text`).
2. Construct a plot of life expectancy and homicide rate conditional on average per capita income.

Table 2.5: USstates data. Socio-demographic variables for ten US states.

Population	Income	Illiteracy	Life.Expectancy	Homicide	Graduates	Freezing
3615	3624	2.1	69.05	15.1	41.3	20
21198	5114	1.1	71.71	10.3	62.6	20
2861	4628	0.5	72.56	2.3	59.0	140
2341	3098	2.4	68.09	12.5	41.0	50
812	4281	0.7	71.23	3.3	57.6	174
10735	4561	0.8	70.82	7.4	53.2	124
2284	4660	0.6	72.13	4.2	60.0	44
11860	4449	1.0	70.43	6.1	50.2	126
681	4167	0.5	72.08	1.7	52.3	172
472	3907	0.6	71.64	5.5	57.1	168

Ex. 2.4 Flury and I
surements on 20(
alr3 (Weisberg, 2

Table 2.6: ba

Length
214.8
214.6
214.8
214.8
215.0
214.4
214.9
214.9
215.0
214.7
⋮

Use whatever grapl
whether there is a
something suspicio

Ex. 2.4 Flury and Riedwyl (1988) report data that give various lengths measurements on 200 Swiss bank notes. The data are available from package **alr3** (Weisberg, 2008); a sample of ten bank notes is given in Table 2.6.

Table 2.6: `banknote` data (package **alr3**). Swiss bank note data.

Length	Left	Right	Bottom	Top	Diagonal
214.8	131.0	131.1	9.0	9.7	141.0
214.6	129.7	129.7	8.1	9.5	141.7
214.8	129.7	129.7	8.7	9.6	142.2
214.8	129.7	129.6	7.5	10.4	142.0
215.0	129.6	129.7	10.4	7.7	141.8
214.4	130.1	130.3	9.7	11.7	139.8
214.9	130.5	130.2	11.0	11.5	139.5
214.9	130.3	130.1	8.7	11.7	140.2
215.0	130.4	130.6	9.9	10.9	140.3
214.7	130.2	130.3	11.8	10.9	139.7
⋮	⋮	⋮	⋮	⋮	⋮

Use whatever graphical techniques you think are appropriate to investigate whether there is any 'pattern' or structure in the data. Do you observe something suspicious?