

Appendix A: Example 1.1.

Ten Biggest American Companies (1990)

Unit: billion \$

	Sales	Profit	Assets
GM	126.974	4.224	173.297
Ford	96.933	3.835	160.893
Exxon	86.656	3.510	83.219
IBM	63.438	3.758	77.734
GE	55.264	3.939	128.344
Mobil	50.976	1.809	39.080
PhilMorr	39.069	2.946	38.528
Chrysler	36.156	0.359	51.038
DuPont	35.209	2.480	34.715
Texaco	32.416	2.413	25.636

(2)
> summary(x)

Sales		Profit		Assets	
Min.	: 32.42	Min.	:0.359	Min.	: 25.64
1st Qu.:	36.88	1st Qu.:	2.430	1st Qu.:	38.67
Median :	53.12	Median :	3.228	Median :	64.39
Mean :	62.31	Mean :	2.927	Mean :	81.25
3rd Qu.:	80.85	3rd Qu.:	3.816	3rd Qu.:	117.10
Max.	:127.00	Max.	:4.224	Max.	:173.30

> var(x)

	Sales	Profit	Assets
Sales	1000.5091	25.57560	1511.82723
Profit	25.5756	1.43002	45.65462
Assets	1511.8272	45.65462	2980.48978

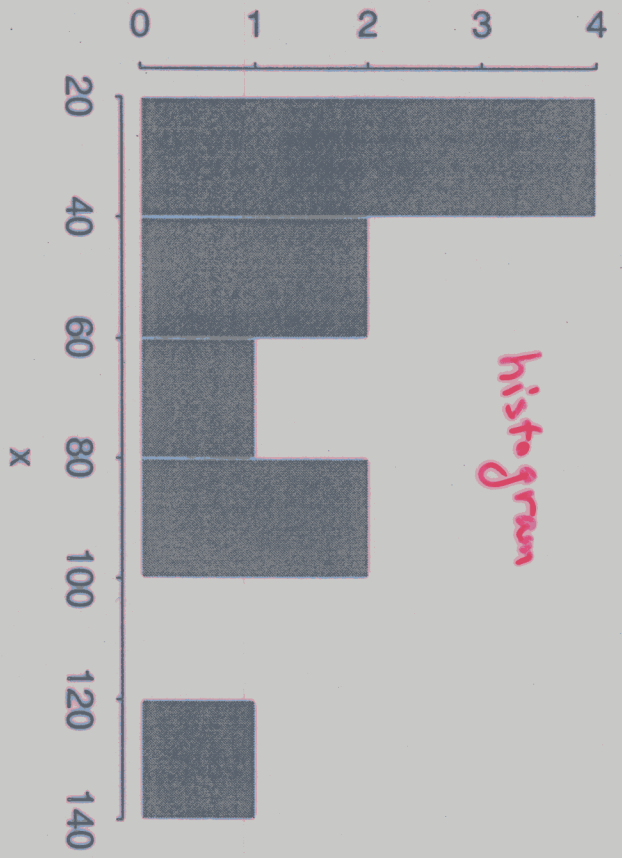
> cor(x)

	Sales	Profit	Assets
Sales	0.9999999	0.6761518	0.8754832
Profit	0.6761518	0.9999999	0.6993101
Assets	0.8754832	0.6993101	1.0000000

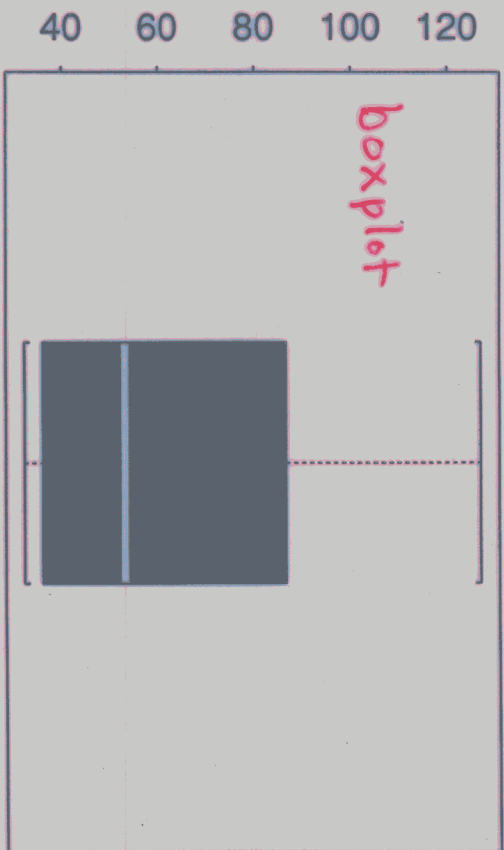
>cor(xx)

	Sales	Profit	Assets	Prof.percent
Sales	0.9999999	0.6761518	0.8754832	-0.3896963
Profit	0.6761518	0.9999999	0.6993101	0.3762998
Assets	0.8754832	0.6993101	1.0000000	-0.2729326
Prof.percent	-0.3896963	0.3762998	-0.2729326	0.9999999

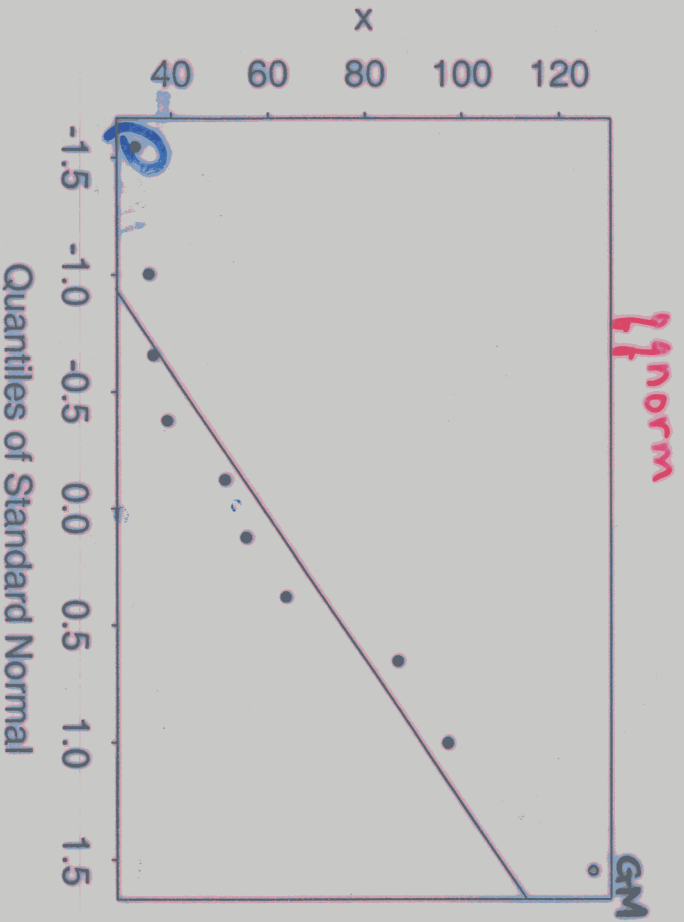
SALES



histogram

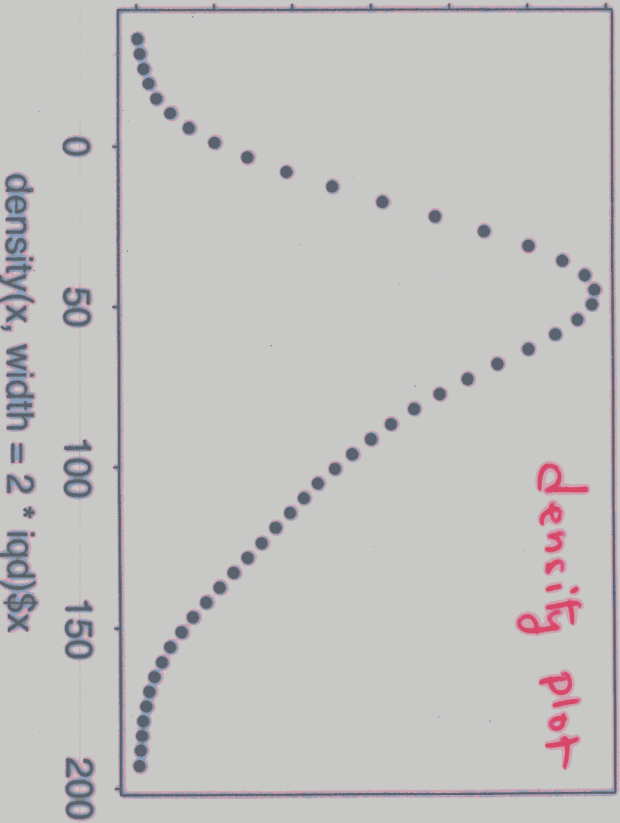


boxplot



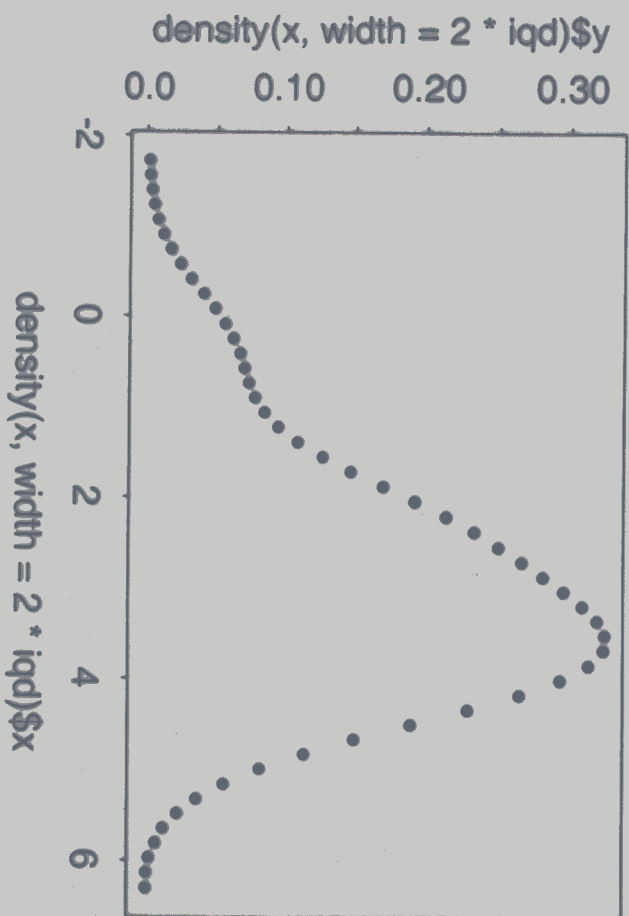
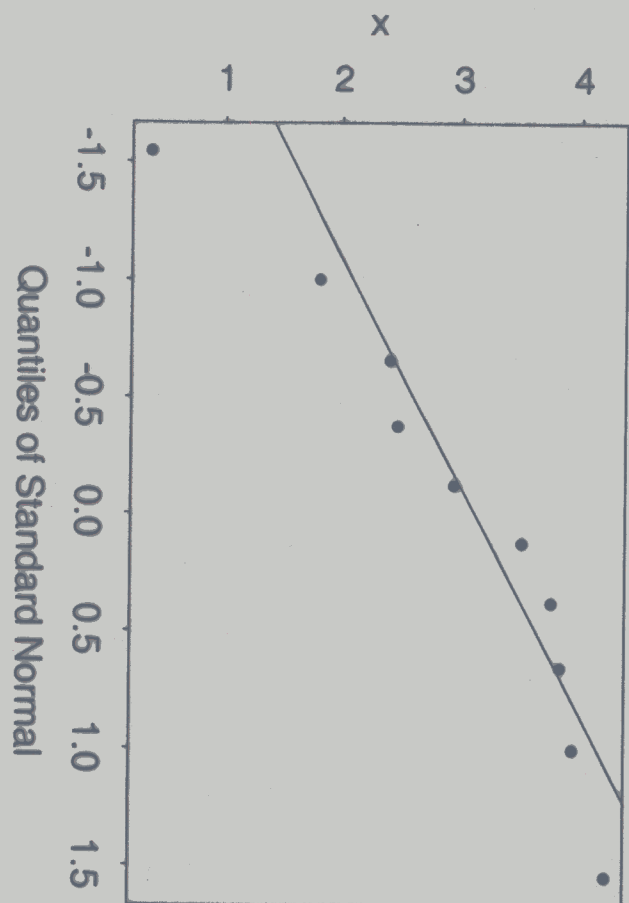
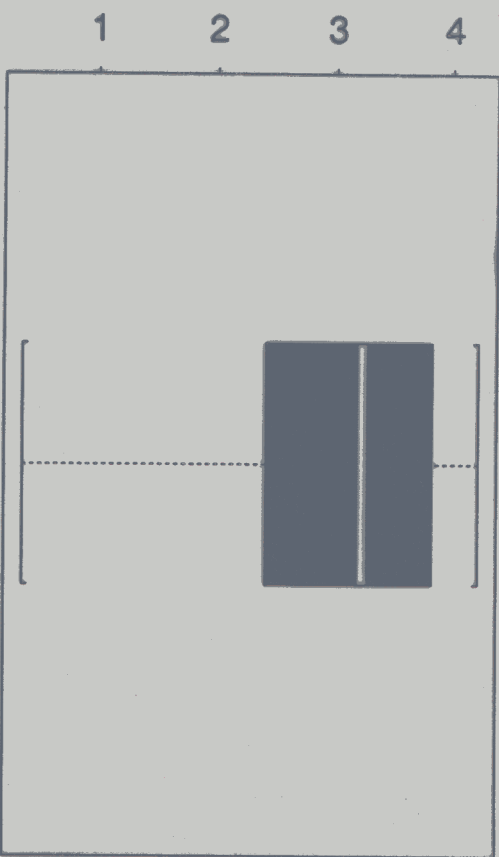
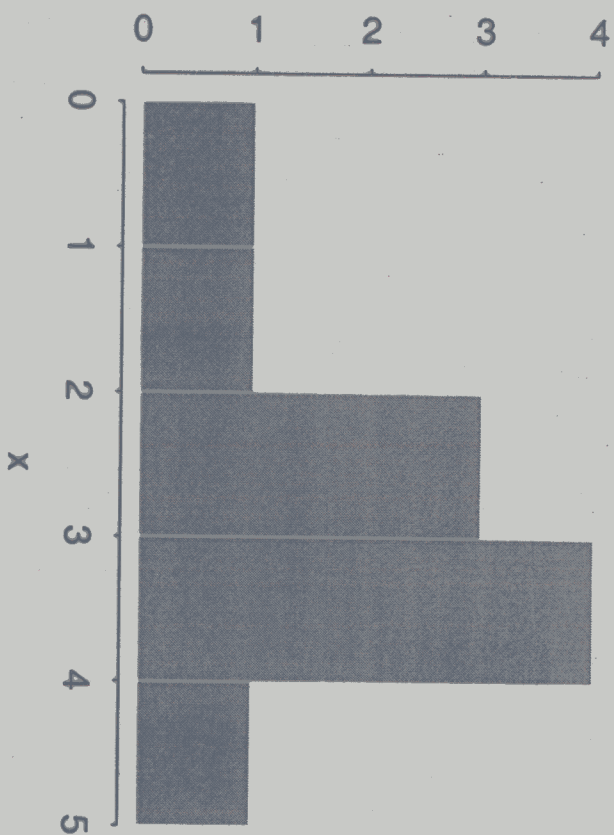
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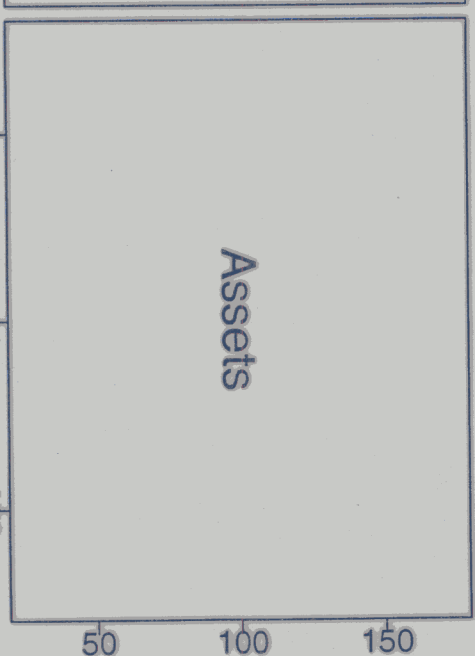
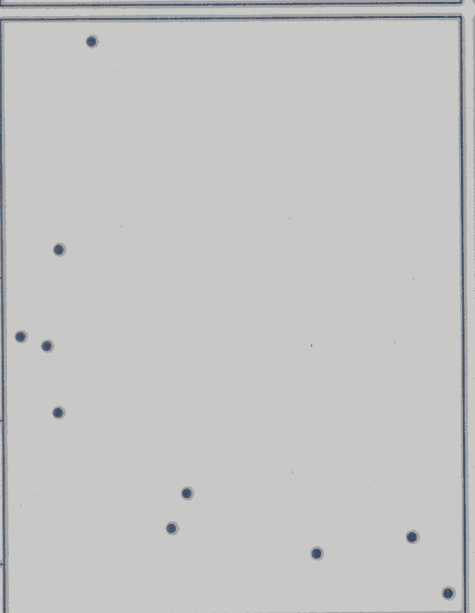
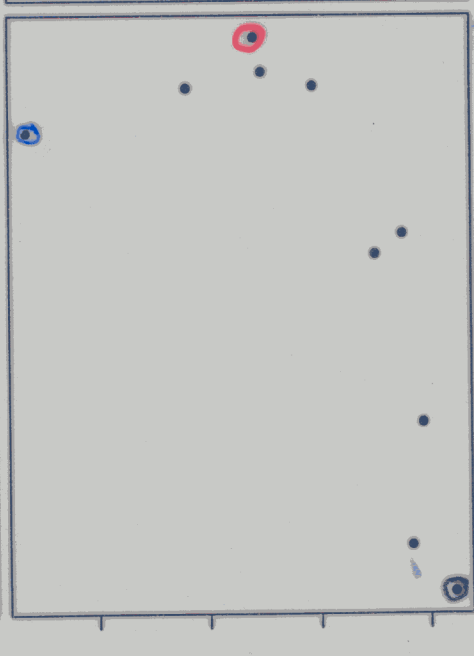
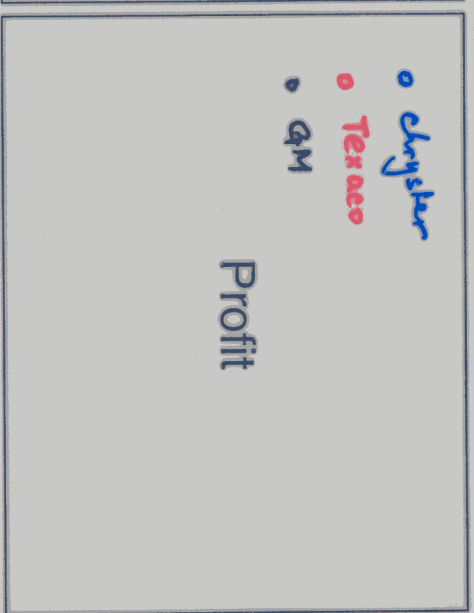
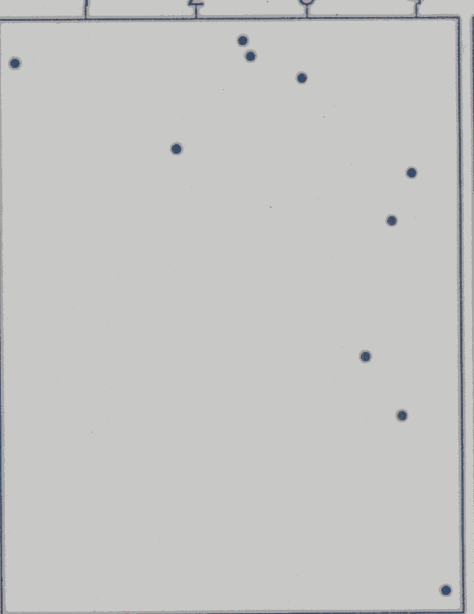
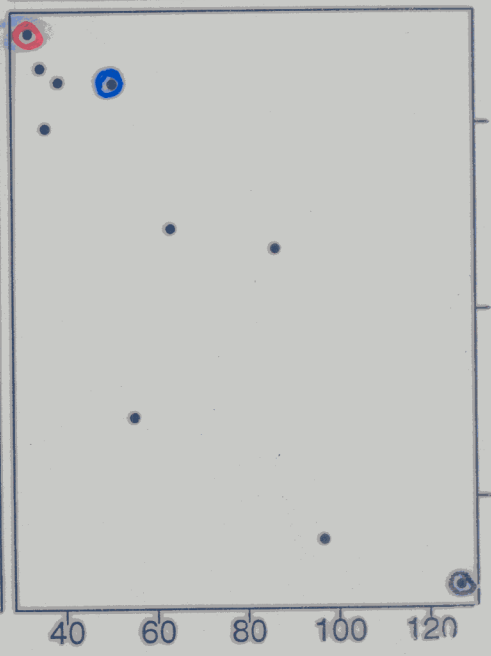
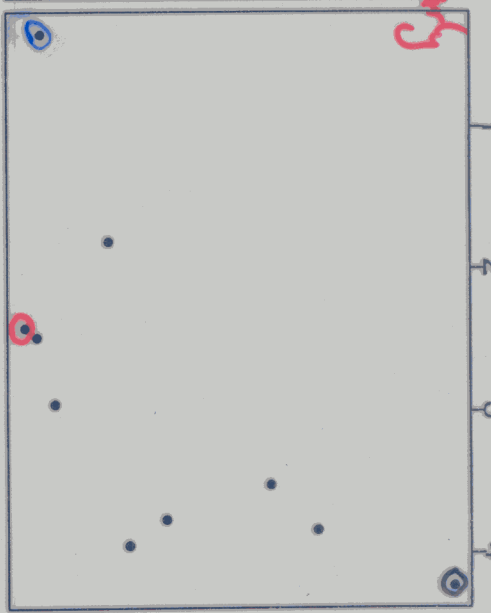
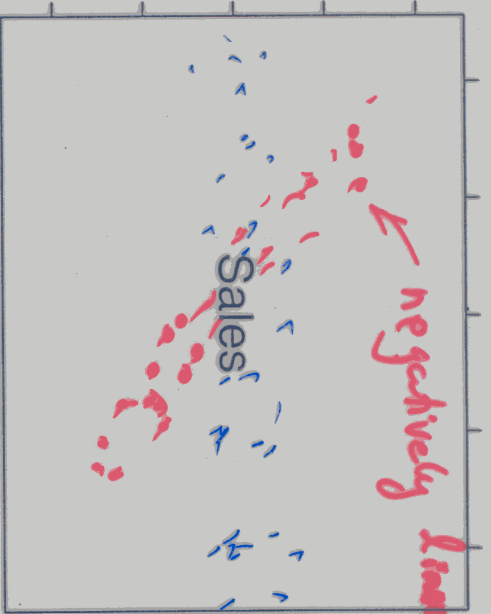
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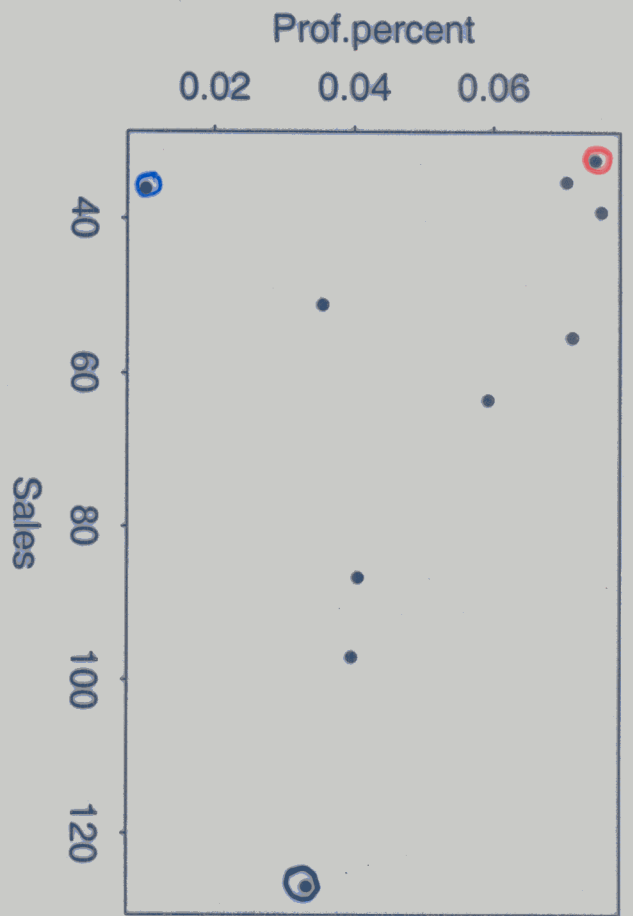


density plot

PROFIT



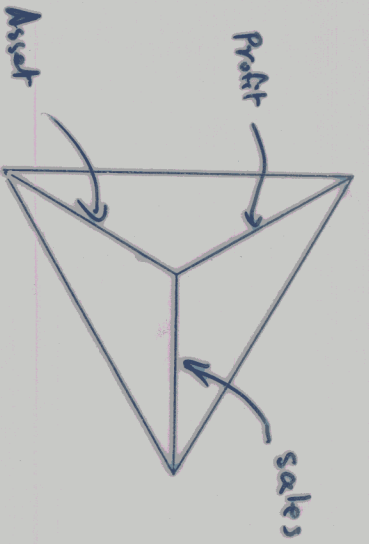




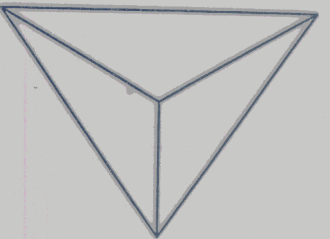
Chrysler
 Texaco
 GM



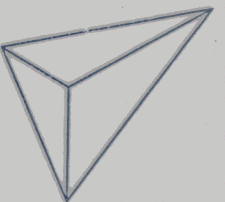
Stars



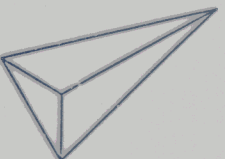
GM



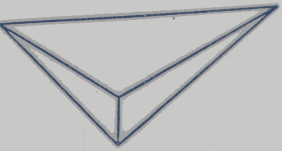
Ford



Exxon



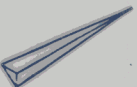
IBM



GE



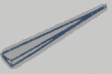
Mobil



PhilMor



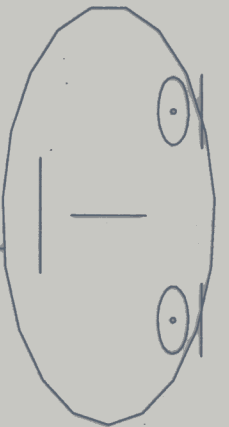
Chrysler



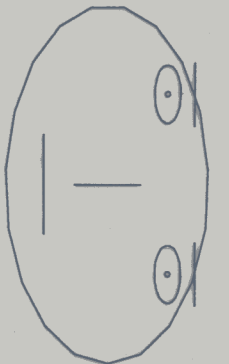
DuPont

Tayann

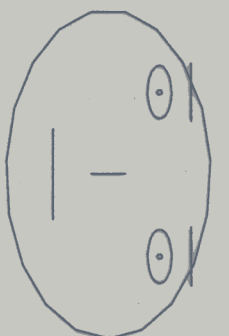
Chernoff Faces



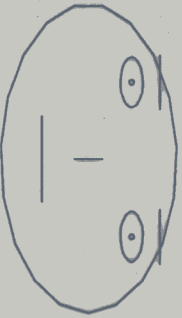
GM



Ford



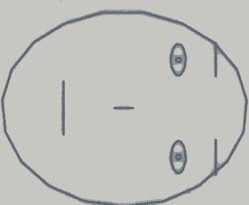
Exxon



IBM



GE



Mobil



PhilMorr



Chrysler



DuPont



Taxaco

- 1: Area of face
- 2: Shape of face
- 3: Length of nose
- 4:

Standardized Data:

	Sales	Profit	Assets
GM	2.04436335	1.08434743	1.68606133
Ford	1.09462525	0.75905156	1.45885631
Exxon	0.76972067	0.48727481	0.03609563
IBM	0.03568987	0.69466138	-0.06437354
GE	-0.22272893	0.84602012	0.86265375
Mobil	-0.35829290	-0.93516290	-0.77240185
PhilMorr	-0.73472948	0.01563762	-0.78251287
Chrysler	-0.82682319	-2.14770533	-0.55336624
DuPont	-0.85676234	-0.37404843	-0.85235589
Texaco	-0.94506228	-0.43007626	-1.01865664

Statistical distances:

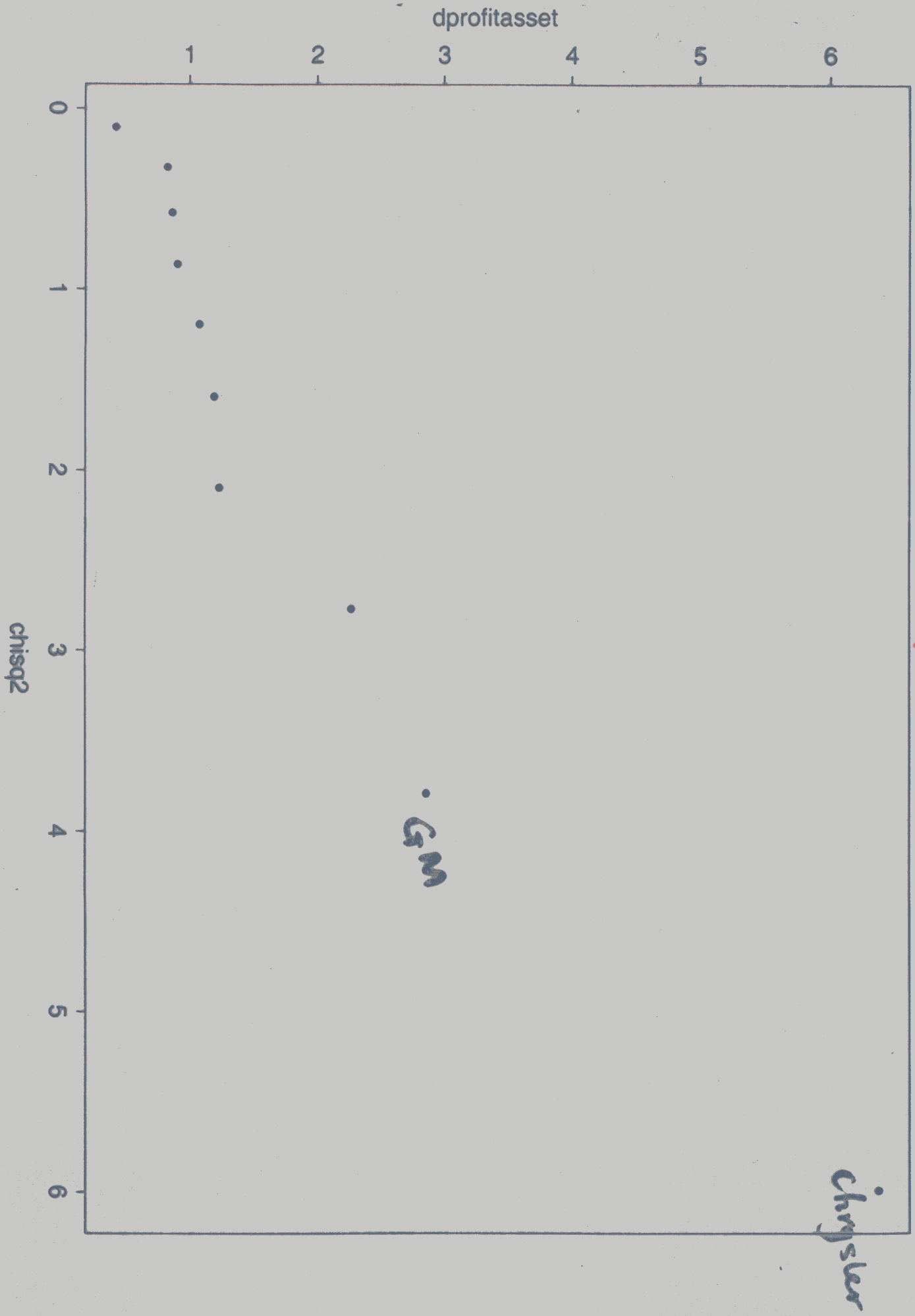
	GM	Ford	Exxon	IBM	GE	Mobil
[1]	4.3524296	2.3613713	2.4712866	1.0749109	5.3676535	1.5003052
	Chrysler	DuPont	Texaco			
[8]	6.4396111	0.9077951	1.2283781			

Pairwise statistical distances (excluding one variable)

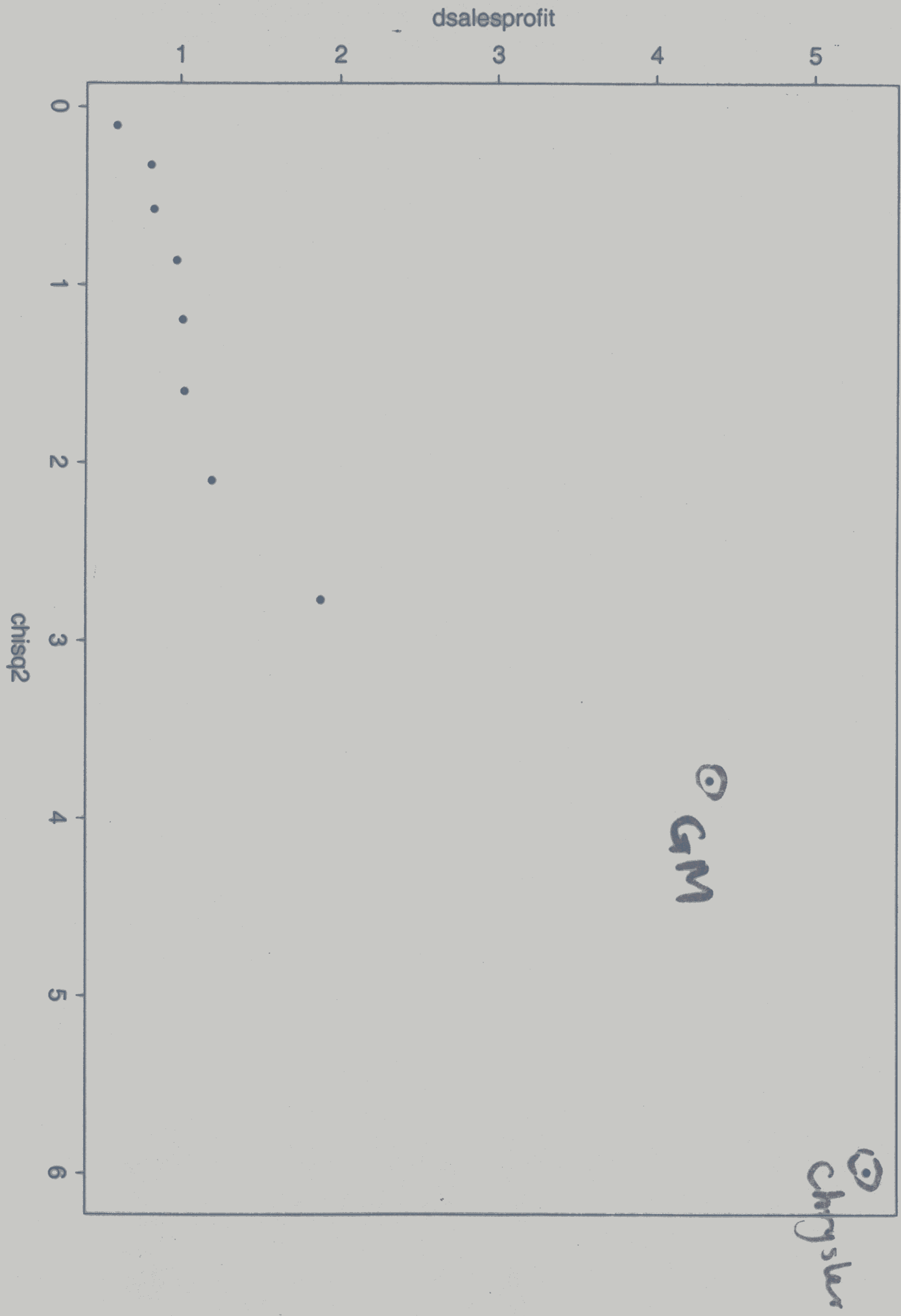
	Prof-Asst	Sale-Asst	Sale-Prof
[1,]	2.8603661	4.22550957	4.3429674
[2,]	2.2617246	2.27100652	1.1988638
[3,]	0.4190892	2.33428982	0.5944972
[4,]	1.0749098	0.04042551	0.8295613
[5,]	0.8595047	4.83968168	1.8794068
[6,]	0.9019804	1.02944447	1.0128568
[7,]	1.2323446	0.62288346	1.0235630
[8,]	6.3735002	0.80812414	5.3330718
[9,]	0.8229743	0.77883331	0.8116529
[10,]	1.1936062	1.04980151	0.9735590

Q-Q χ^2 plot

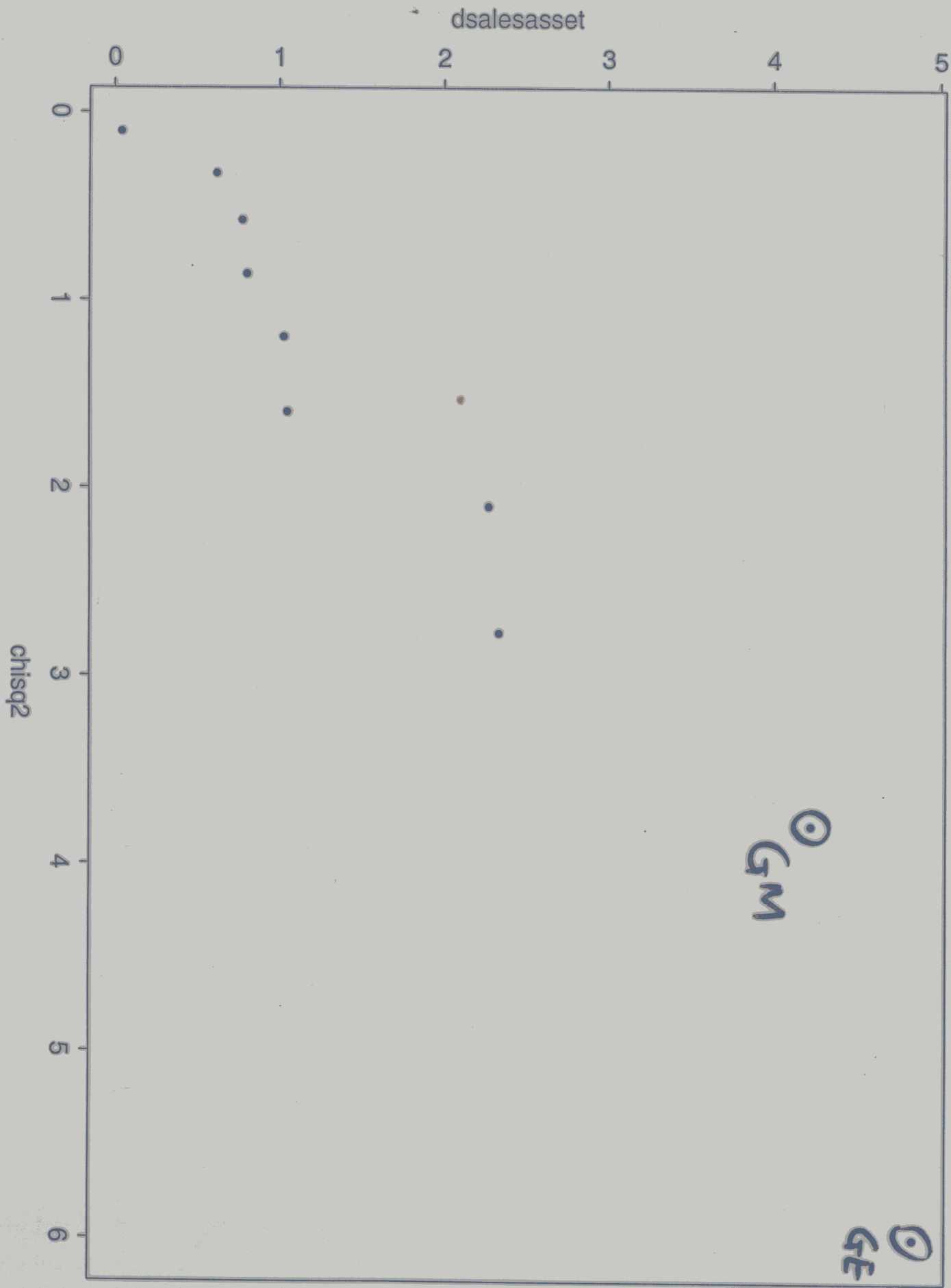
with profit and asset



Q-Q χ^2 plot with sales and profit



Q-Q χ^2 plot with sales and asset



Q-Q χ^2 plot with all three variables.

