

The dataset `mtcars` available in R contains the following information :

Description:

The data was extracted from the 1974 `_Motor Trend_` US magazine, and comprises fuel consumption and 10 aspects of automobile design and performance for 32 automobiles (1973-74 models).

Format:

A data frame with 32 observations on 11 variables.

observed →	[, 1]	mpg	Miles/(US) gallon
	[, 2]	cyl	Number of cylinders
	[, 3]	disp	Displacement (cu.in.)
	[, 4]	hp	Gross horsepower
	[, 5]	drat	Rear axle ratio
	[, 6]	wt	Weight (lb/1000)
	[, 7]	qsec	1/4 mile time
	[, 8]	vs	V/S
	[, 9]	am	Transmission (0 = automatic, 1 = manual)
	[,10]	gear	Number of forward gears
	[,11]	carb	Number of carburetors

10 predictors

```
> summary(lm(mpg ~ ., data=mtcars))
```

Call:

```
lm(formula = mpg ~ ., data = mtcars)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.4506	-1.6044	-0.1196	1.2193	4.6271

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	12.30337	18.71788	0.657	0.5181
cyl	-0.11144	1.04502	-0.107	0.9161
disp	0.01334	0.01786	0.747	0.4635
hp	-0.02148	0.02177	-0.987	0.3350
drat	0.78711	1.63537	0.481	0.6353
wt	-3.71530	1.89441	-1.961	0.0633
qsec	0.82104	0.73084	1.123	0.2739
vs	0.31776	2.10451	0.151	0.8814
am	2.52023	2.05665	1.225	0.2340
gear	0.65541	1.49326	0.439	0.6652
carb	-0.19942	0.82875	-0.241	0.8122

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.65 on 21 degrees of freedom

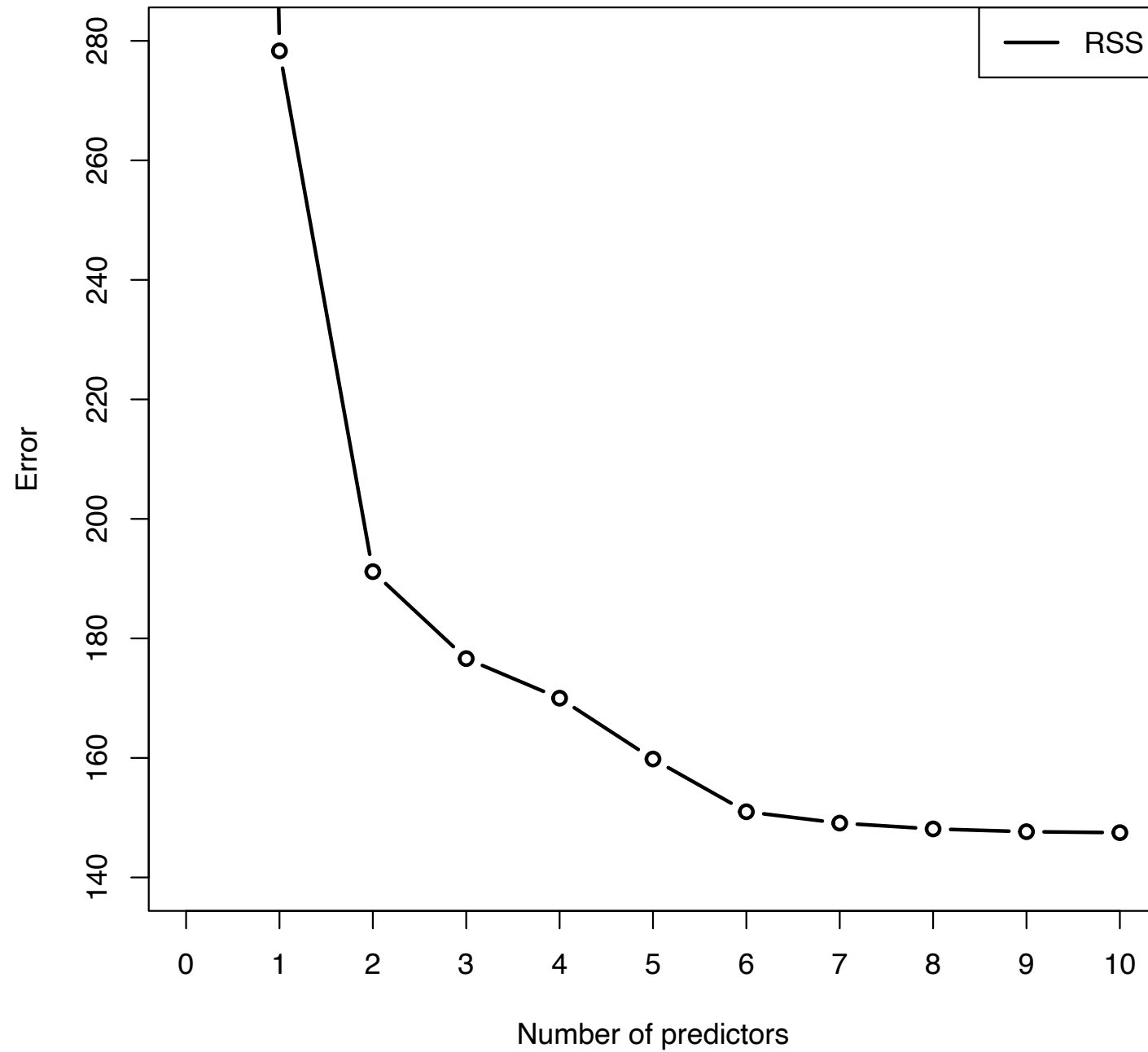
Multiple R-squared: 0.869, Adjusted R-squared: 0.8066

F-statistic: 13.93 on 10 and 21 DF, p-value: 3.793e-07

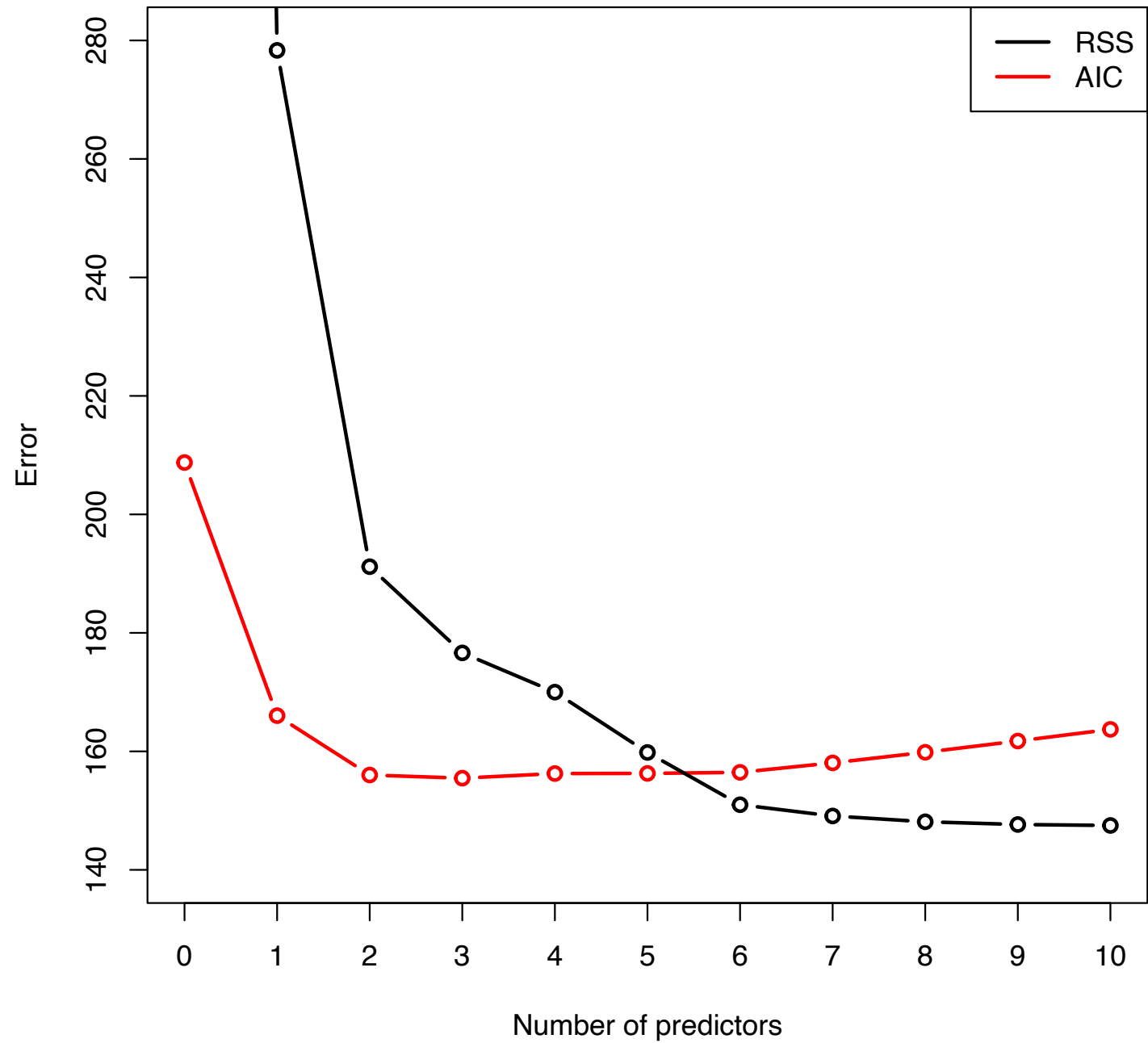
None of the t-tests is rejected...

Sign of strong correlation between variables !

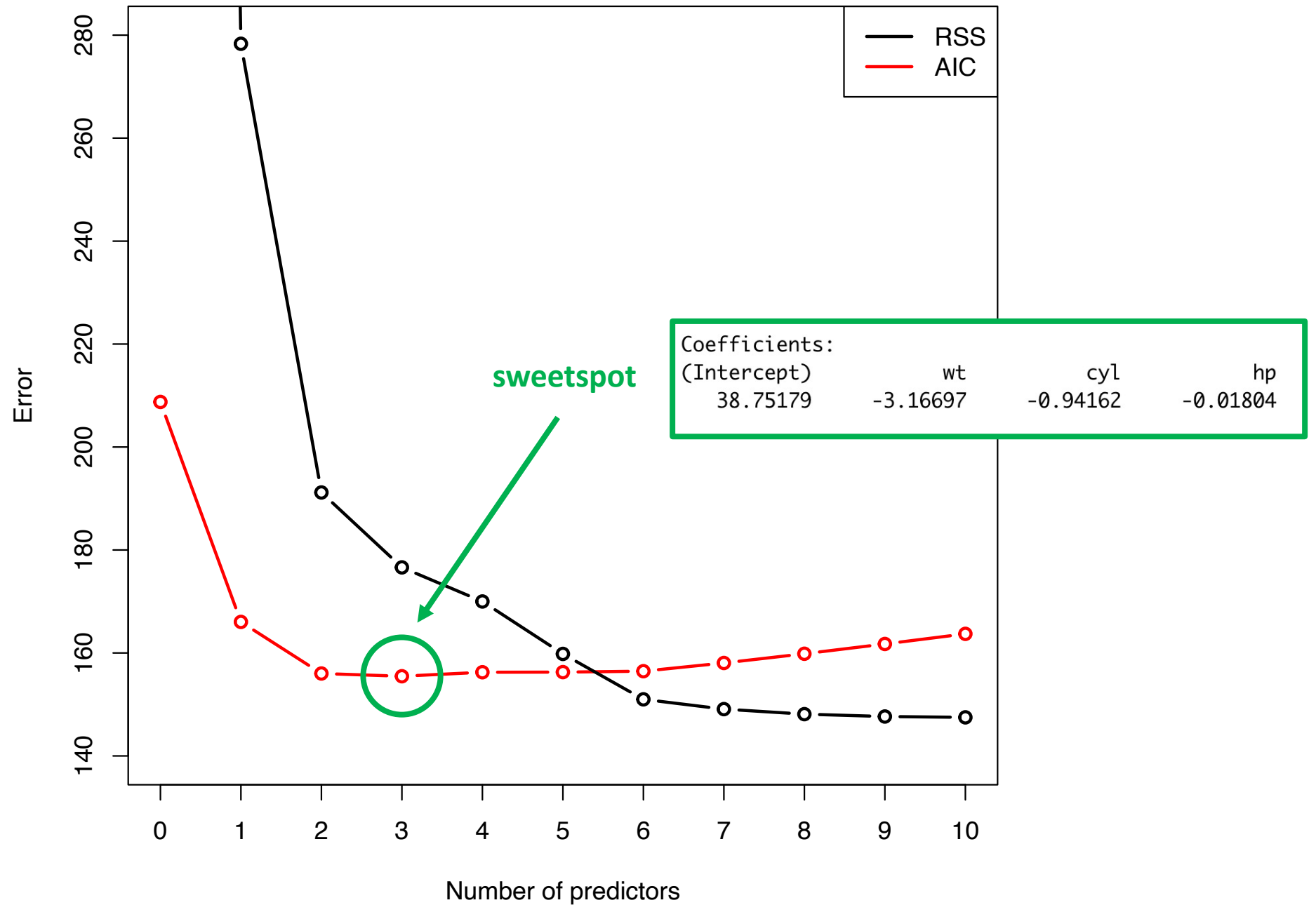
Forward stepwise selection



Forward stepwise selection



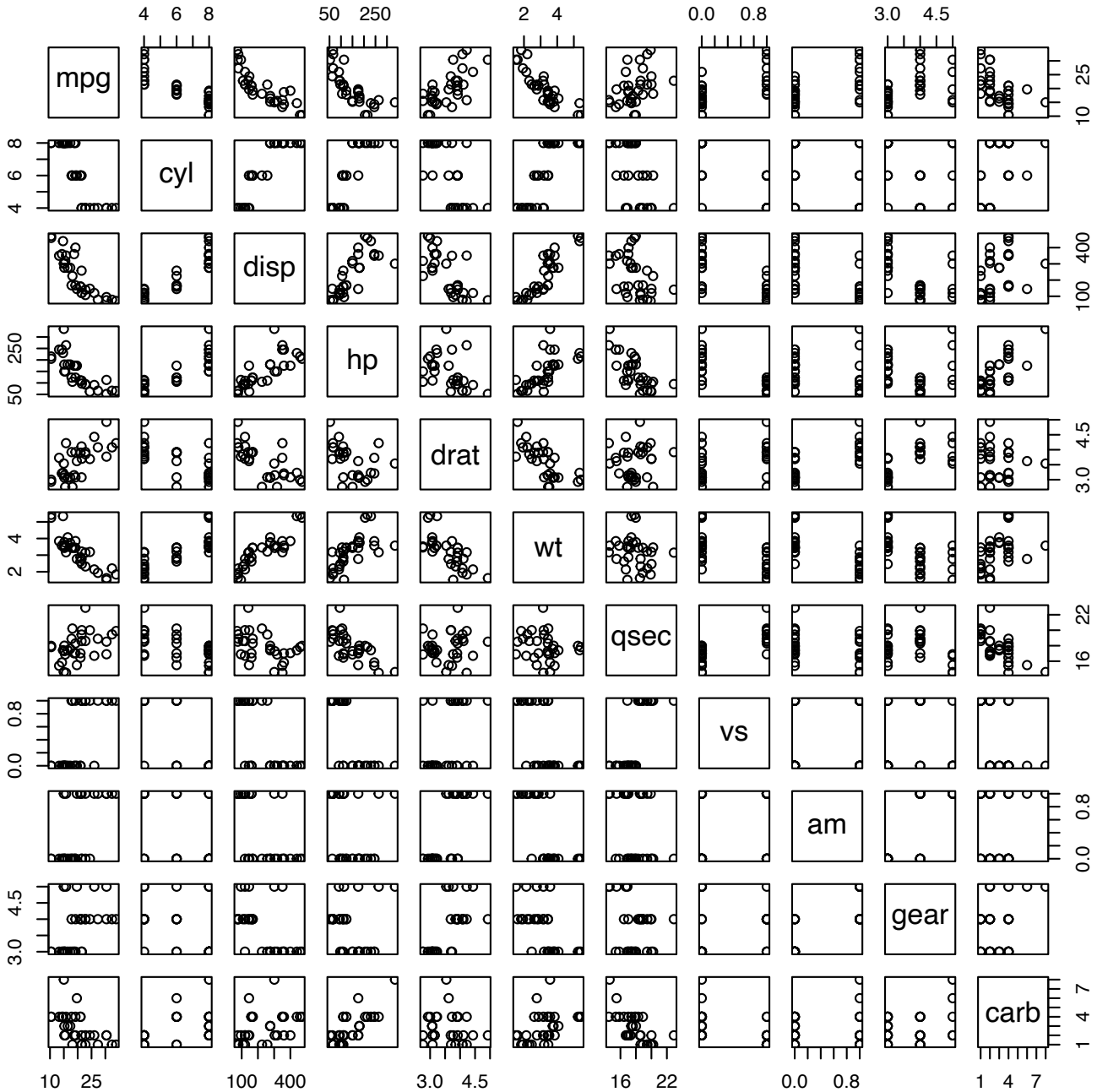
Forward stepwise selection



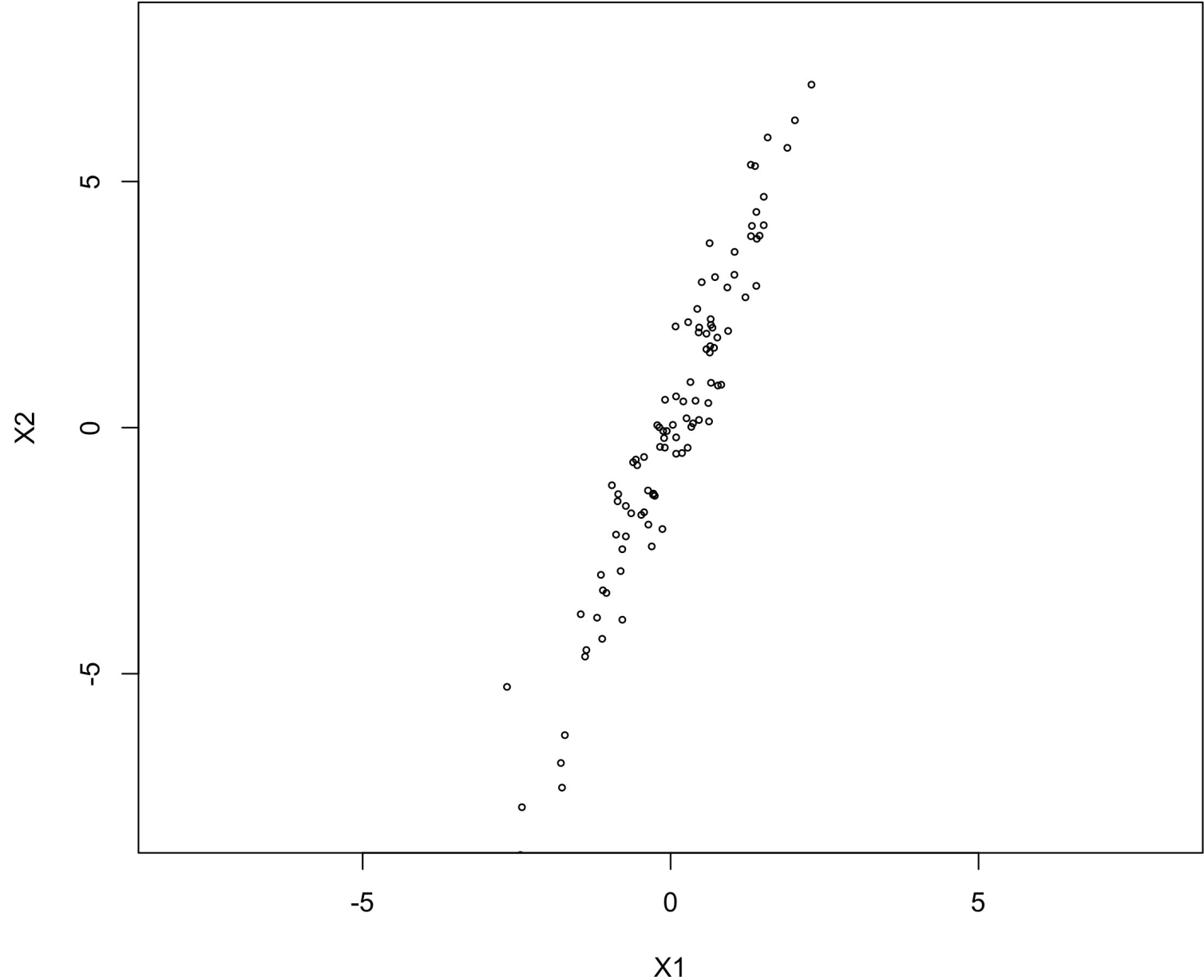
mtcars has 32 observations with 10 features

> mtcars

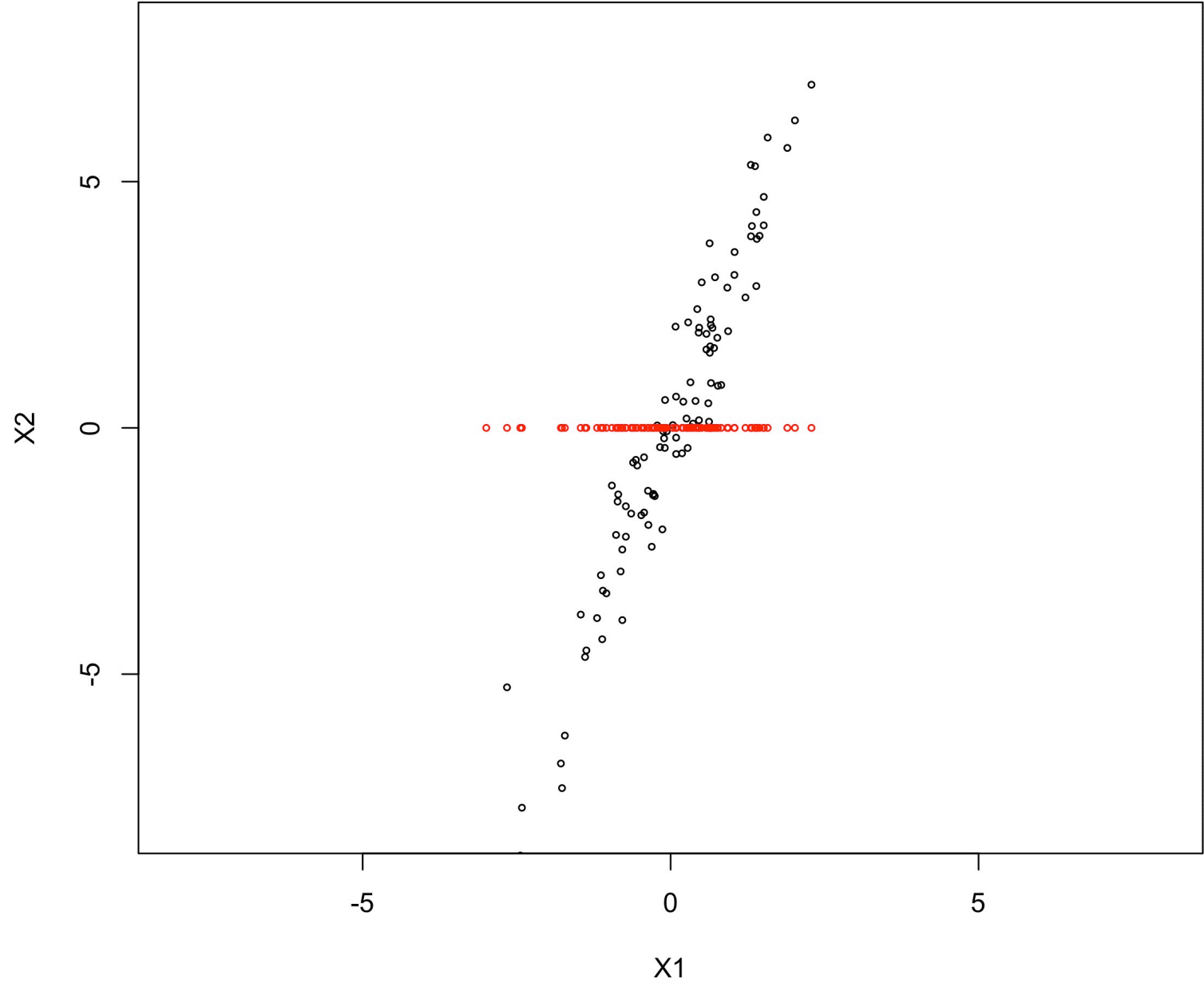
	mpg	cyl	displacement	horsepower	drat	weight	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1	0	3	1
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1	0	4	2
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1	0	4	2
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4
Merc 280C	17.8	6	167.6	123	3.92	3.440	18.90	1	0	4	4
Merc 450SE	16.4	8	275.8	180	3.07	4.070	17.40	0	0	3	3
Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60	0	0	3	3
Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00	0	0	3	3
Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98	0	0	3	4
Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82	0	0	3	4
Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42	0	0	3	4
Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47	1	1	4	1
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	2
Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90	1	1	4	1
Toyota Corona	21.5	4	120.1	97	3.70	2.465	20.01	1	0	3	1
Dodge Challenger	15.5	8	318.0	150	2.76	3.520	16.87	0	0	3	2
AMC Javelin	15.2	8	304.0	150	3.15	3.435	17.30	0	0	3	2
Camaro Z28	13.3	8	350.0	245	3.73	3.840	15.41	0	0	3	4
Pontiac Firebird	19.2	8	400.0	175	3.08	3.845	17.05	0	0	3	2
Fiat X1-9	27.3	4	79.0	66	4.08	1.935	18.90	1	1	4	1
Porsche 914-2	26.0	4	120.3	91	4.43	2.140	16.70	0	1	5	2
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90	1	1	5	2
Ford Pantera L	15.8	8	351.0	264	4.22	3.170	14.50	0	1	5	4
Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50	0	1	5	6
Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60	0	1	5	8
Volvo 142E	21.4	4	121.0	109	4.11	2.780	18.60	1	1	4	2



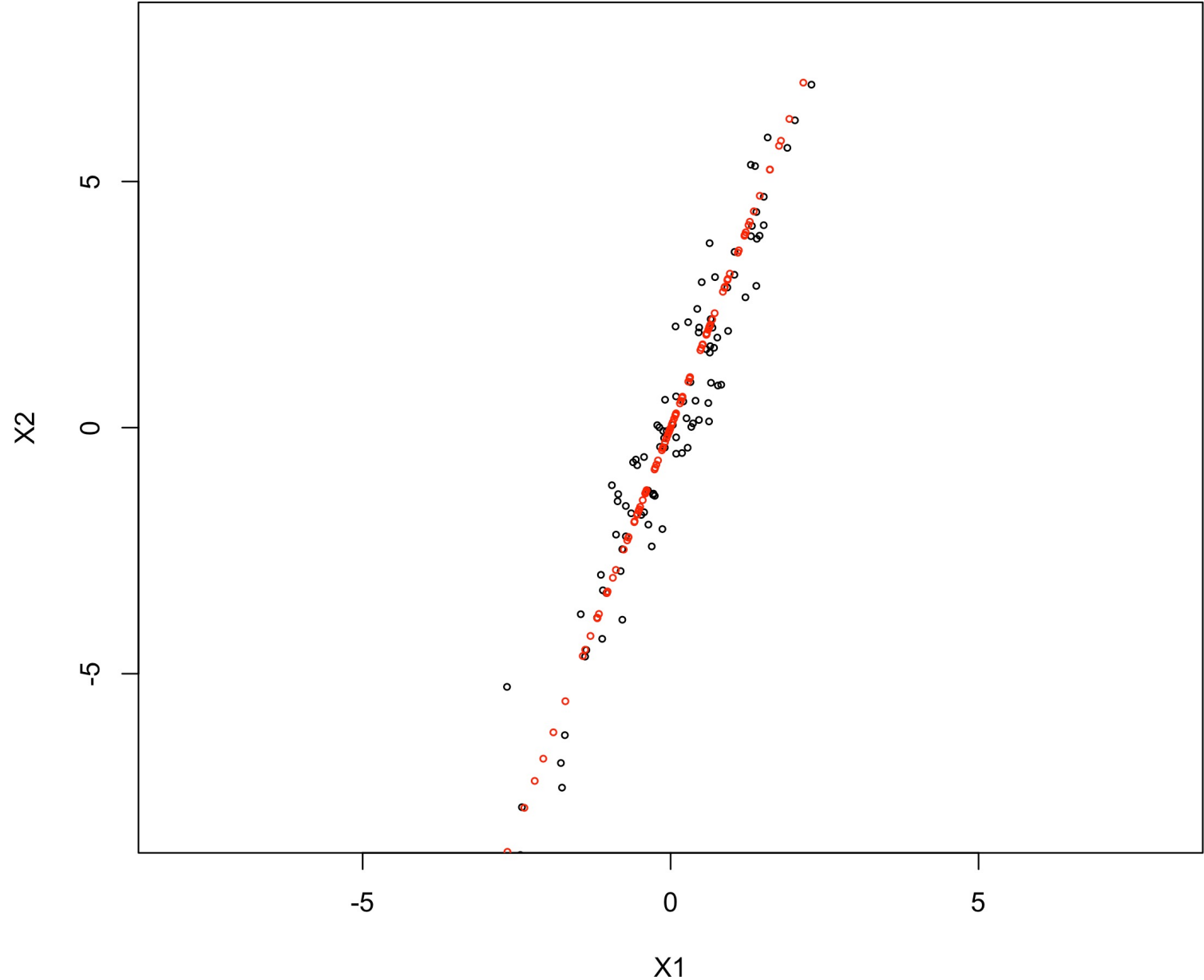
Simulated dataset from TP1



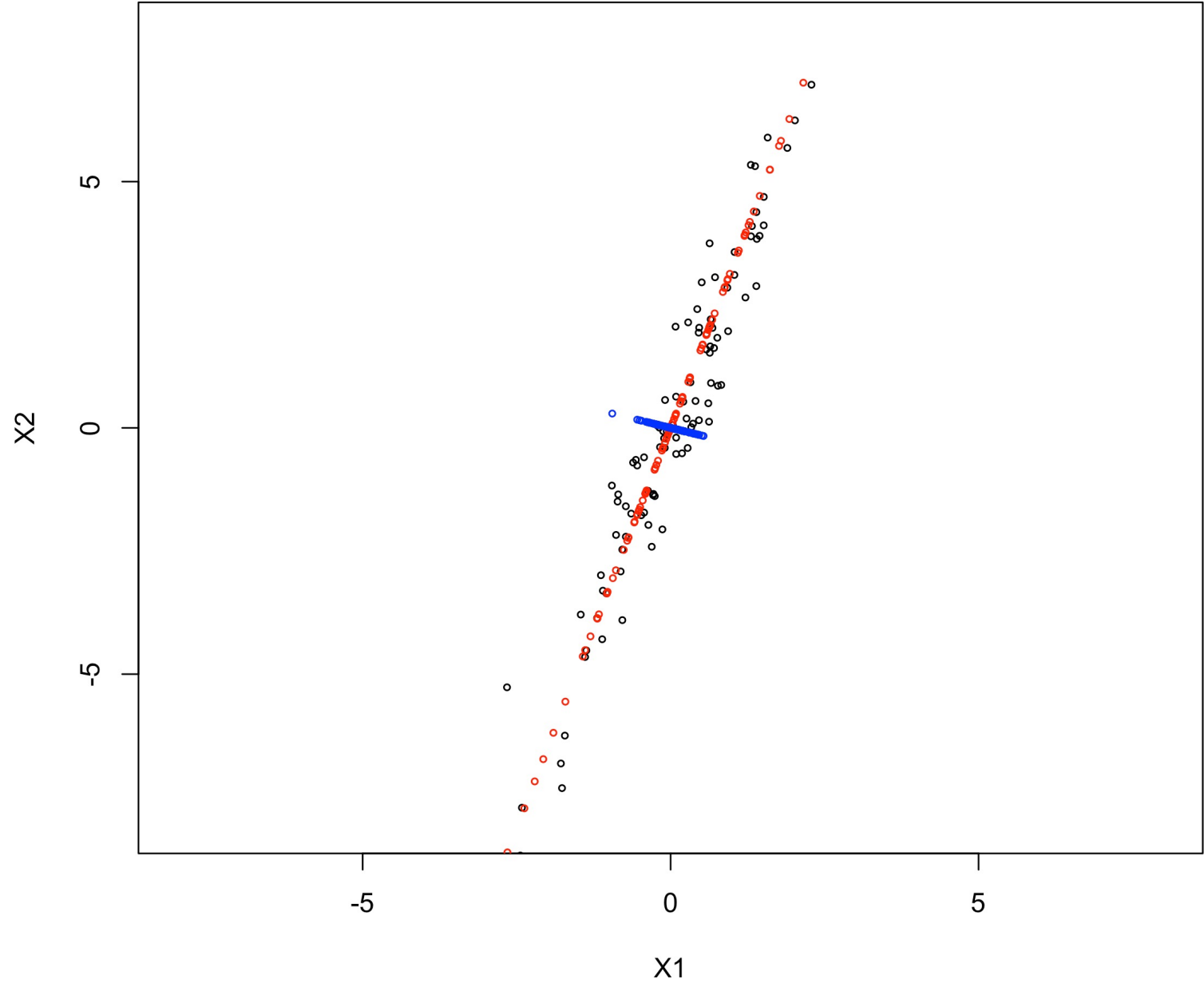
Simulated dataset from TP1



Simulated dataset from TP1



Simulated dataset from TP1



economics has data from 12 countries describing 6 economic indicators in 1991

observations

features

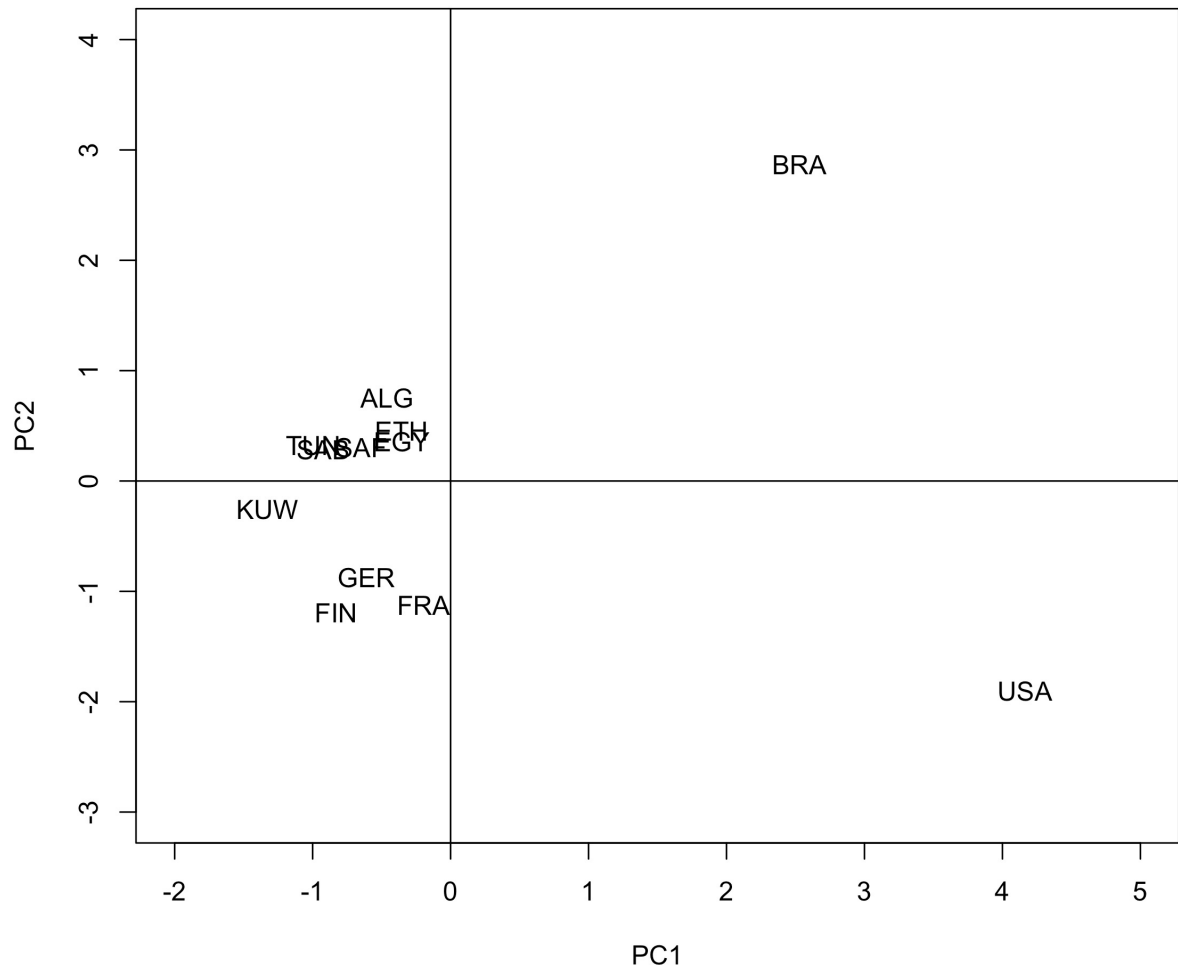
> df

	gnb.capita	inflation	unemployment	external.trade	population	area
South Africa	2810	14.7	0.0	6.3	36.8	1.22
Algeria	1540	50.0	24.3	4.2	26.1	2.38
Germany	24130	3.5	5.1	23.5	81.0	0.35
Saudi Arabia	7328	4.4	0.0	22.1	14.8	2.15
Brazil	2400	440.8	4.8	10.5	153.0	8.51
Egypt	620	19.8	17.5	-5.9	56.1	1.00
USA	21890	4.2	6.7	-73.4	255.0	9.36
Ethiopia	110	35.7	0.0	-0.6	54.6	1.22
Finland	25800	4.1	7.7	2.2	5.0	0.33
France	21030	3.2	9.4	-10.1	57.2	0.55
Kuwait	14000	3.3	0.0	20.0	1.3	0.02
Tunisia	1350	8.2	15.0	-0.9	8.6	0.16

economics has data from 12 countries describing 6 economic indicators in 1991

observations

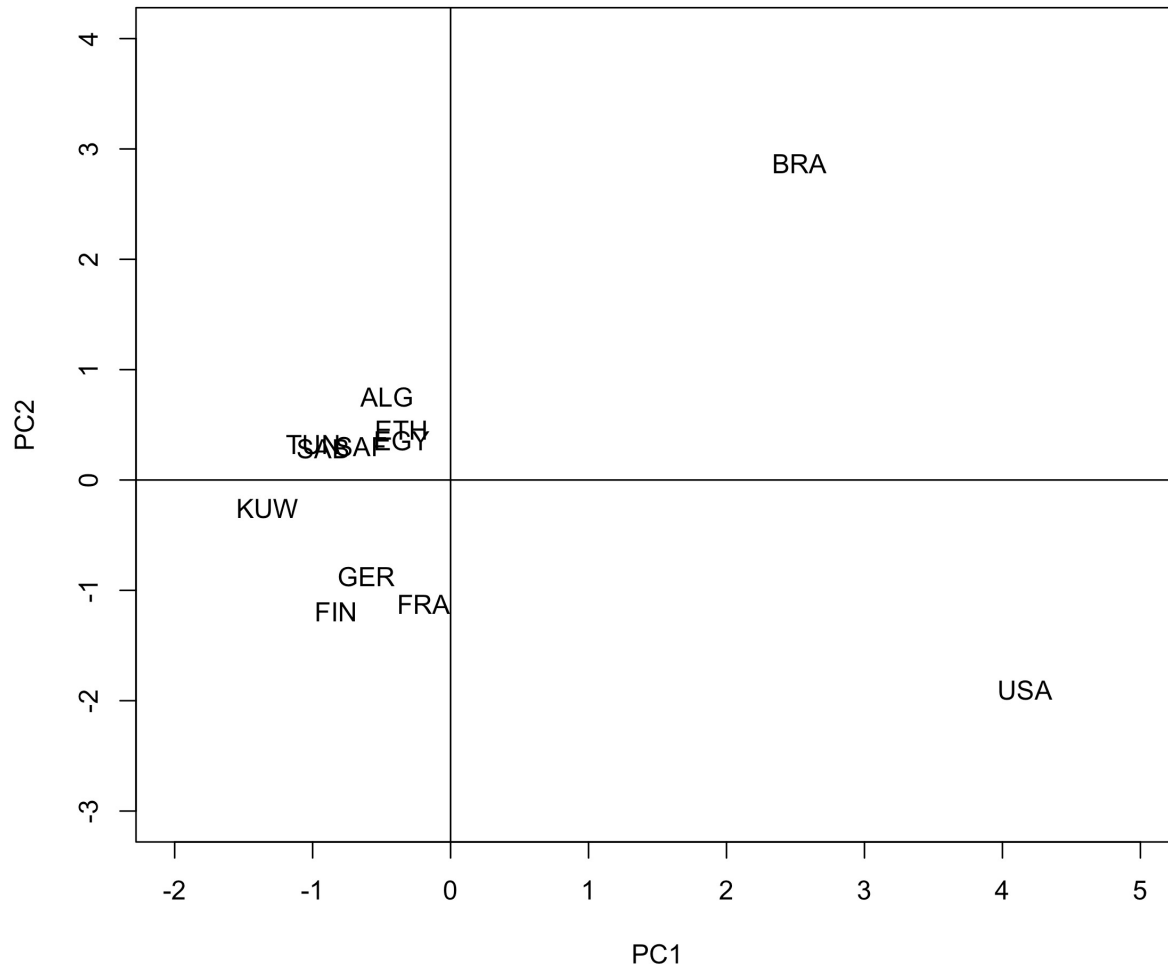
features



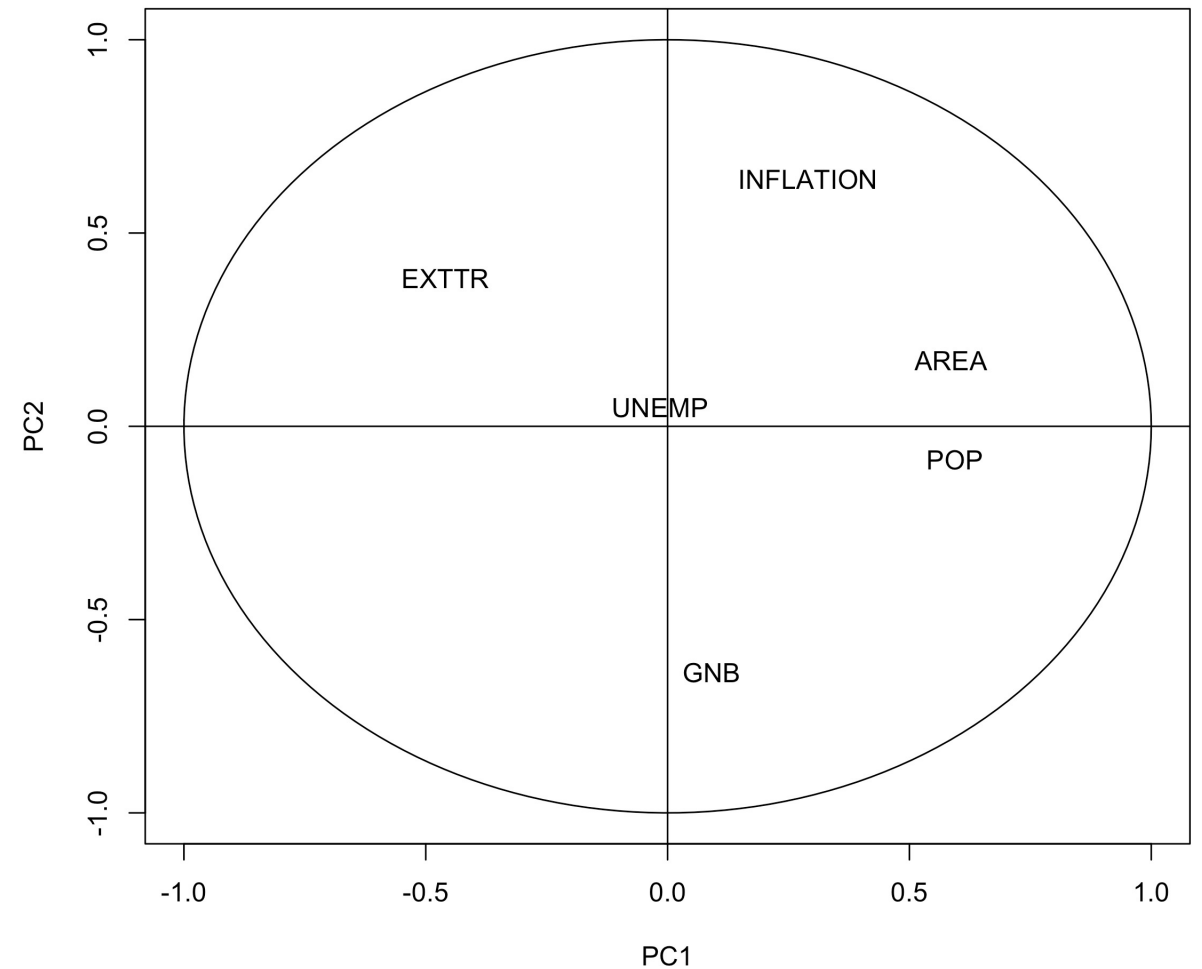
	PC1	PC2
gnb.capita	0.09086083	-0.63680828
inflation	0.29040994	0.63938098
unemployment	-0.01546447	0.04793568
external.trade	-0.45931569	0.38336688
population	0.59388598	-0.08569851
area	0.58608511	0.17045510

economics has data from 12 countries describing 6 economic indicators in 1991

SAMPLES SPACE



VARIABLES SPACE



economics has data from 12 countries describing 6 economic indicators in 1991

