

Preliminary Analysis

Karol Kubicki

29.12.2014

In this document you can find a preliminary analysis of the dataset presented below.

```
input <- MASS::Cars93
```

Input consists of following columns:

##	[1]	"Manufacturer"	"Model"	"Type"
##	[4]	"Min.Price"	"Price"	"Max.Price"
##	[7]	"MPG.city"	"MPG.highway"	"AirBags"
##	[10]	"DriveTrain"	"Cylinders"	"EngineSize"
##	[13]	"Horsepower"	"RPM"	"Rev.per.mile"
##	[16]	"Man.trans.avail"	"Fuel.tank.capacity"	"Passengers"
##	[19]	"Length"	"Wheelbase"	"Width"
##	[22]	"Turn.circle"	"Rear.seat.room"	"Luggage.room"
##	[25]	"Weight"	"Origin"	"Make"

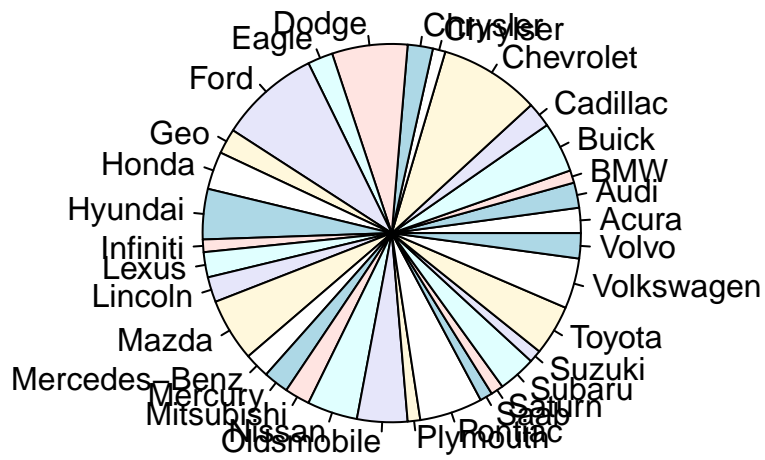
Let's analyze each of them (numeric or character columns) one by one.

```
library(knitr)
for(col in names(input)){
  if(is.numeric(input[,col])){
    plot.new()
    print(" ", quote = FALSE)
    hist(input[,col], main = col, xlab = NA)
    plot.new()
    print(" ", quote = FALSE)
    boxplot(input[,col], main = col, xlab = NA)
    print(kable(as.data.frame(as.list(summary(input[,col])))), caption = col))

  } else if (is.character(input[, col]) || is.factor(input[, col]) ){
    plot.new()
    print(" ", quote = FALSE)
    pie(summary(input[,col]), main = col, xlab = NA)
    plot.new()
    print(" ", quote = FALSE)
    par(mai=c(1,2,1,1))
    barplot(summary(input[,col]), main = col, xlab = NA, horiz = TRUE, las=1)
    print(kable(data.frame(count = summary(as.factor(input[,col])),
                                percentage = 100*summary(as.factor(input[,col]))/length(input[,col])
                                ), caption = col))
  }
}
```

[1]

Manufacturer



[1]

Manufacturer

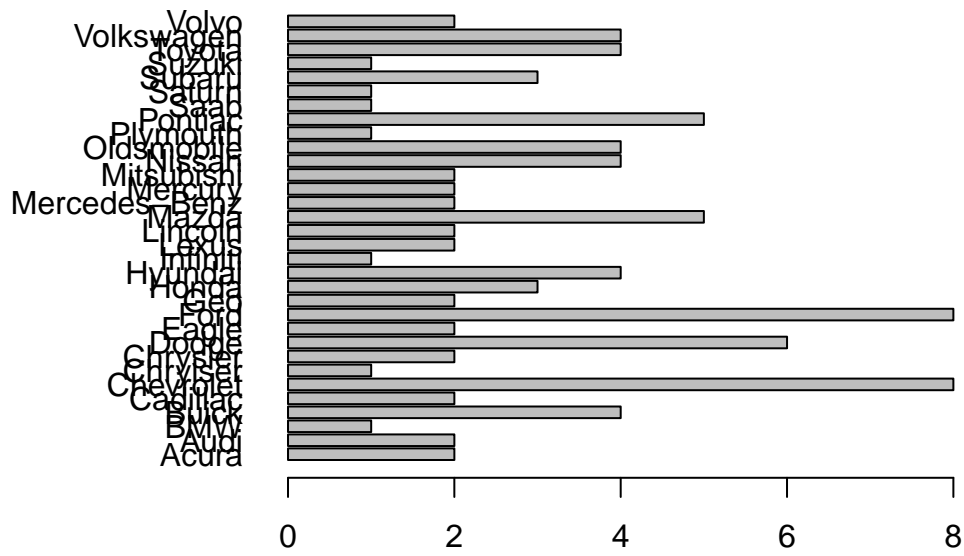
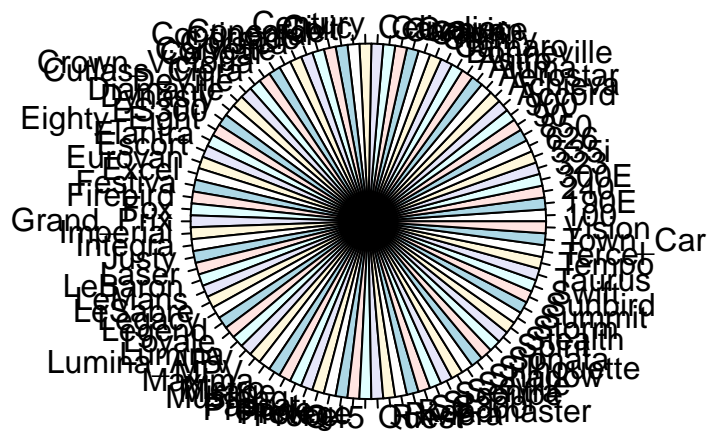


Table: Manufacturer

	count	percentage
Acura	2	2.150538
Audi	2	2.150538
BMW	1	1.075269
Buick	4	4.301075
Cadillac	2	2.150538
Chevrolet	8	8.602151
Chrylser	1	1.075269
Chrysler	2	2.150538
Dodge	6	6.451613
Eagle	2	2.150538
Ford	8	8.602151
Geo	2	2.150538
Honda	3	3.225807
Hyundai	4	4.301075
Infiniti	1	1.075269
Lexus	2	2.150538
Lincoln	2	2.150538
Mazda	5	5.376344
Mercedes-Benz	2	2.150538
Mercury	2	2.150538
Mitsubishi	2	2.150538
Nissan	4	4.301075
Oldsmobile	4	4.301075
Plymouth	1	1.075269
Pontiac	5	5.376344
Saab	1	1.075269
Saturn	1	1.075269
Subaru	3	3.225807
Suzuki	1	1.075269
Toyota	4	4.301075
Volkswagen	4	4.301075
Volvo	2	2.150538

[1]

Model



[1]

Model

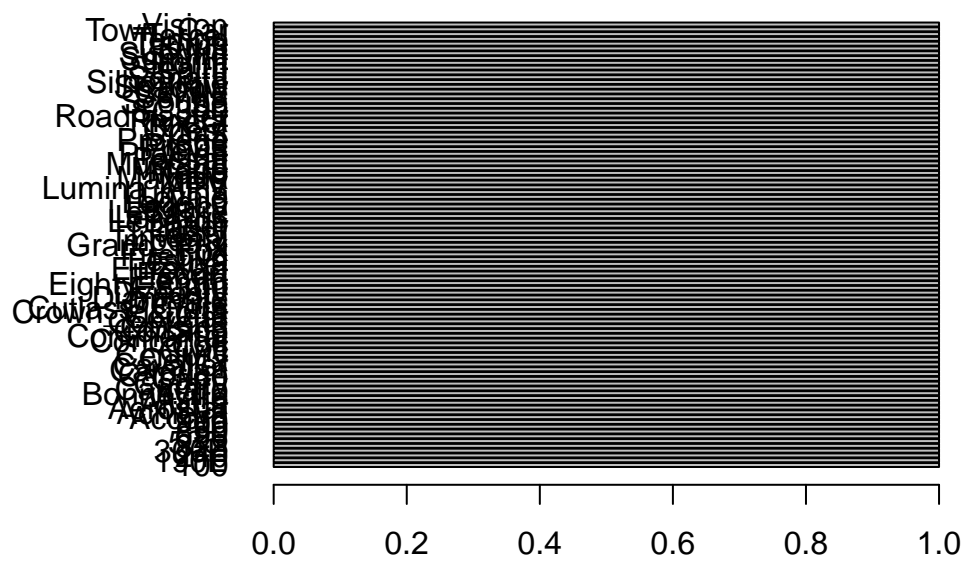
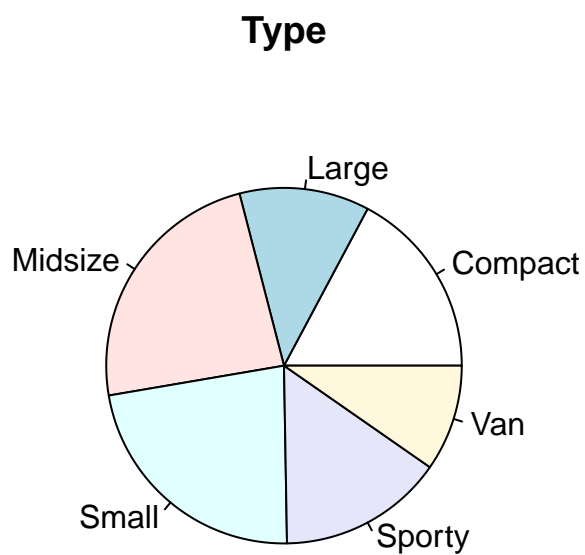


Table: Model

	count	percentage
100	1	1.075269
190E	1	1.075269
240	1	1.075269
300E	1	1.075269
323	1	1.075269
535i	1	1.075269
626	1	1.075269
850	1	1.075269
90	1	1.075269
900	1	1.075269
Accord	1	1.075269
Achieva	1	1.075269
Aerostar	1	1.075269
Altima	1	1.075269
Astro	1	1.075269
Bonneville	1	1.075269
Camaro	1	1.075269
Camry	1	1.075269
Capri	1	1.075269
Caprice	1	1.075269
Caravan	1	1.075269
Cavalier	1	1.075269
Celica	1	1.075269
Century	1	1.075269
Civic	1	1.075269
Colt	1	1.075269
Concorde	1	1.075269
Continental	1	1.075269
Corrado	1	1.075269
Corsica	1	1.075269
Corvette	1	1.075269
Cougar	1	1.075269
Crown_Victoria	1	1.075269
Cutlass_Ciera	1	1.075269
DeVille	1	1.075269
Diamante	1	1.075269
Dynasty	1	1.075269
ES300	1	1.075269
Eighty-Eight	1	1.075269
Elantra	1	1.075269
Escort	1	1.075269
Eurovan	1	1.075269
Excel	1	1.075269
Festiva	1	1.075269
Firebird	1	1.075269
Fox	1	1.075269
Grand_Prix	1	1.075269
Imperial	1	1.075269
Integra	1	1.075269

Justy	1	1.075269
Laser	1	1.075269
LeBaron	1	1.075269
LeMans	1	1.075269
LeSabre	1	1.075269
Legacy	1	1.075269
Legend	1	1.075269
Loyale	1	1.075269
Lumina	1	1.075269
Lumina_APV	1	1.075269
MPV	1	1.075269
Maxima	1	1.075269
Metro	1	1.075269
Mirage	1	1.075269
Mustang	1	1.075269
Passat	1	1.075269
Prelude	1	1.075269
Previa	1	1.075269
Probe	1	1.075269
Protege	1	1.075269
Q45	1	1.075269
Quest	1	1.075269
RX-7	1	1.075269
Riviera	1	1.075269
Roadmaster	1	1.075269
SC300	1	1.075269
SL	1	1.075269
Scoupe	1	1.075269
Sentra	1	1.075269
Seville	1	1.075269
Shadow	1	1.075269
Silhouette	1	1.075269
Sonata	1	1.075269
Spirit	1	1.075269
Stealth	1	1.075269
Storm	1	1.075269
Summit	1	1.075269
Sunbird	1	1.075269
Swift	1	1.075269
Taurus	1	1.075269
Tempo	1	1.075269
Tercel	1	1.075269
Town_Car	1	1.075269
Vision	1	1.075269

[1]



[1]

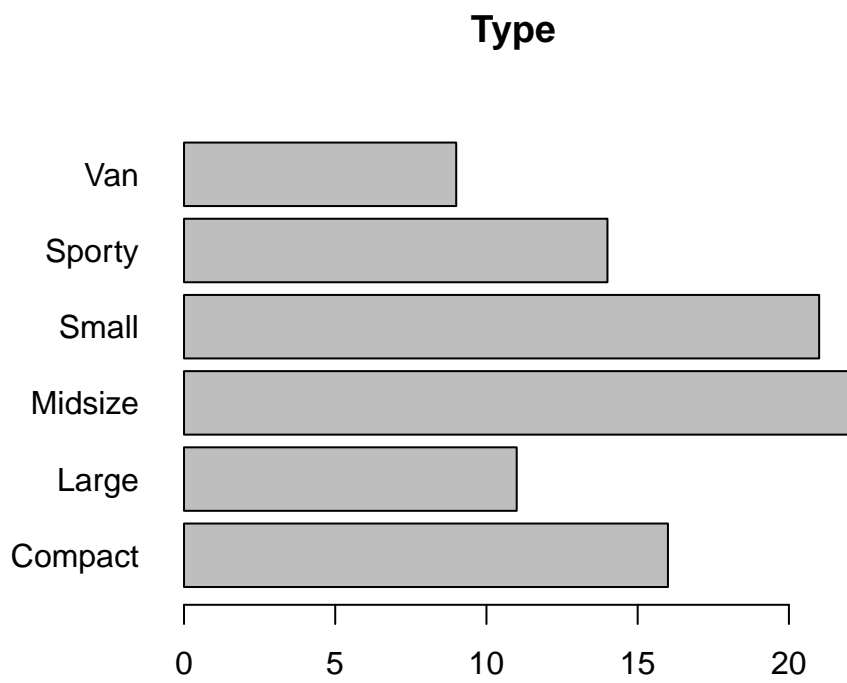
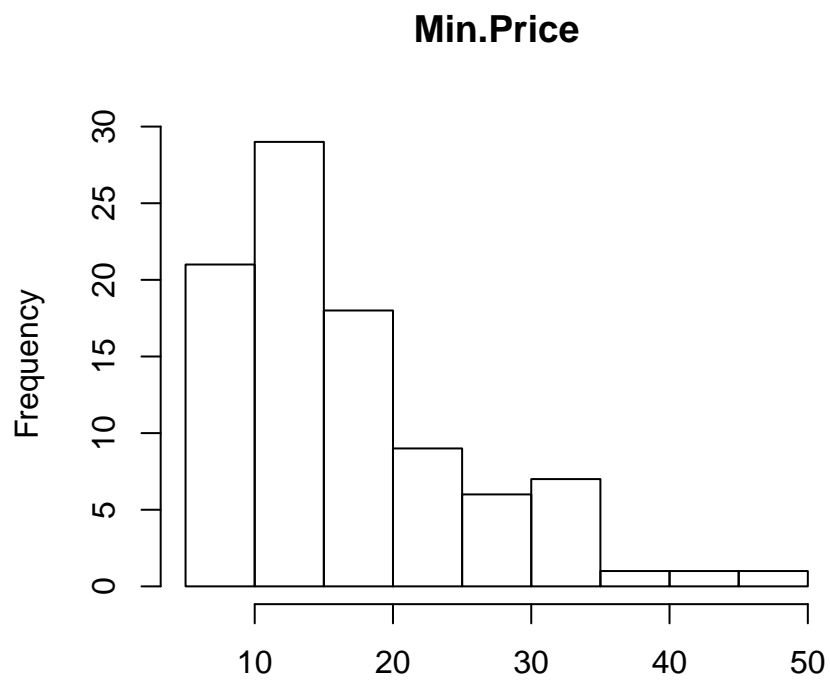


Table: Type

	count	percentage
Compact	16	17.204301
Large	11	11.827957
Midsize	22	23.655914
Small	21	22.580645
Sporty	14	15.053763
Van	9	9.677419

[1]



[1]

Min.Price

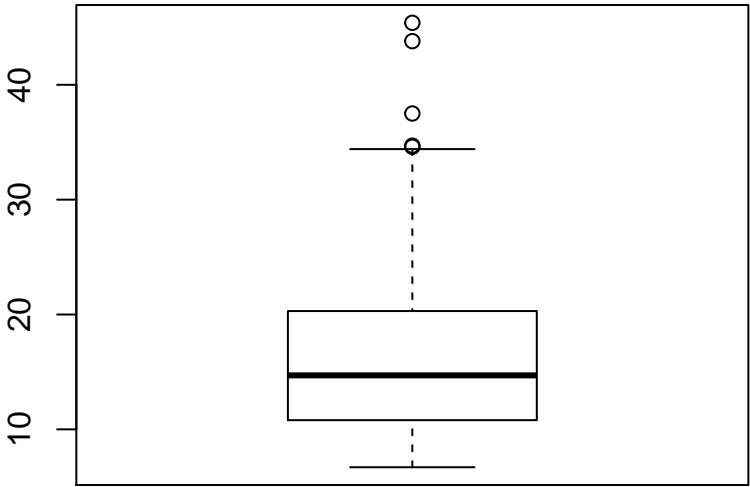
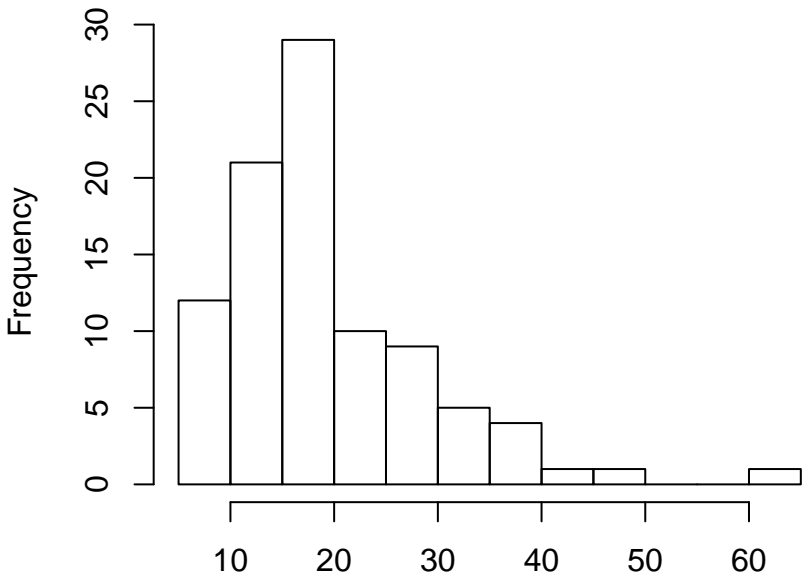


Table: Min.Price

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
6.7	10.8	14.7	17.13	20.3	45.4

[1]

Price



[1]

Price

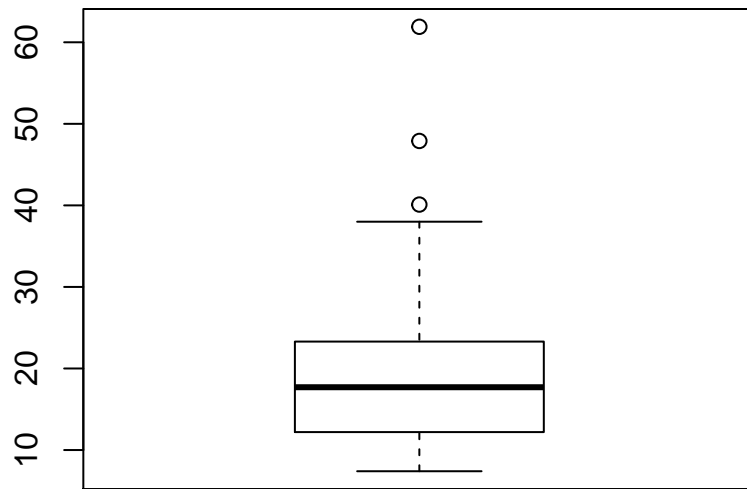
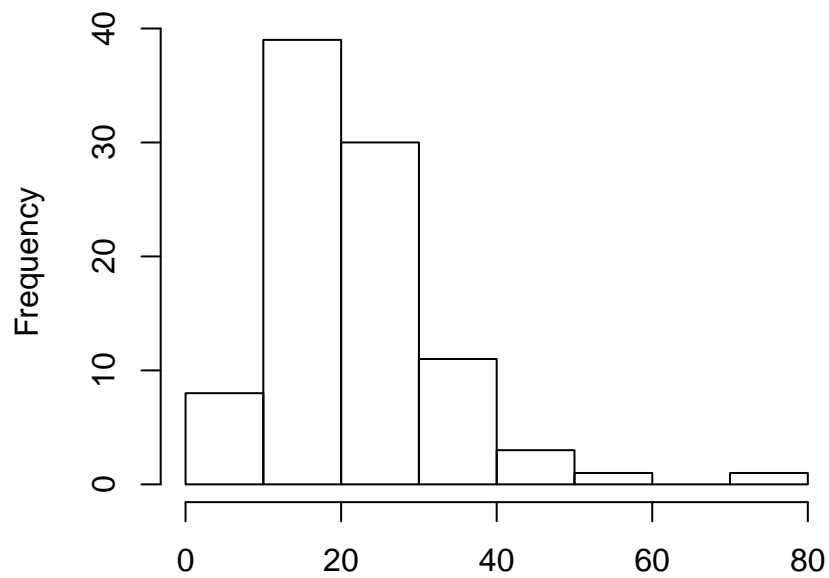


Table: Price

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
7.4	12.2	17.7	19.51	23.3	61.9

[1]

Max.Price



[1]

Max.Price

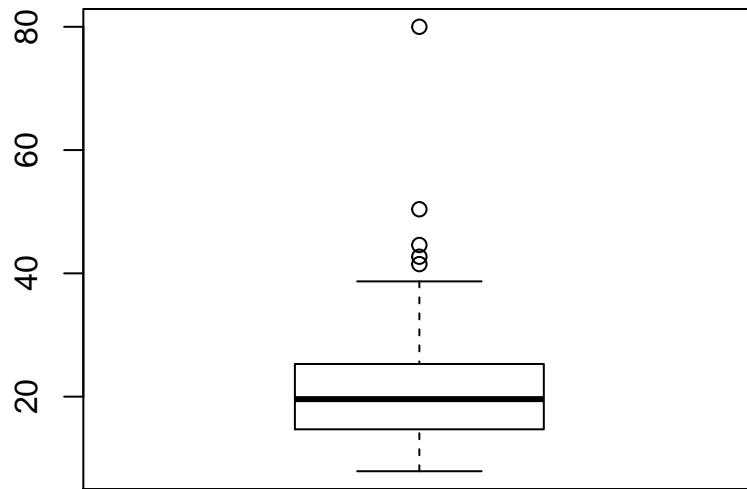
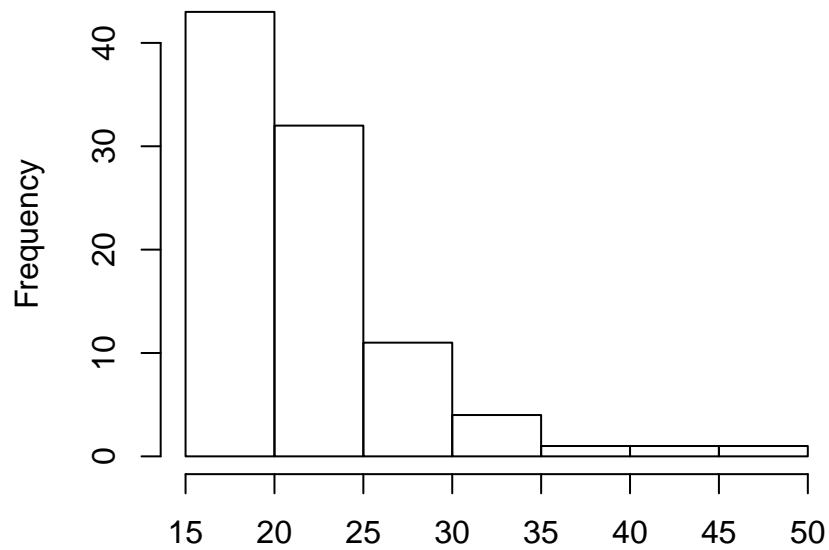


Table: Max.Price

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
7.9	14.7	19.6	21.9	25.3	80

[1]

MPG.city



[1]

MPG.city

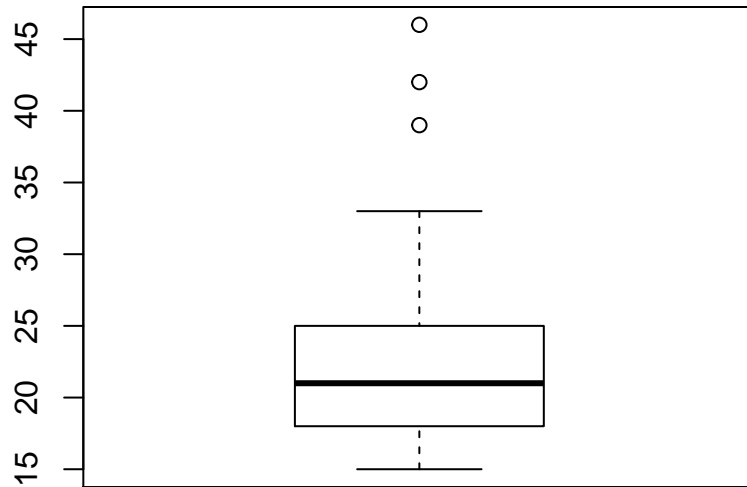
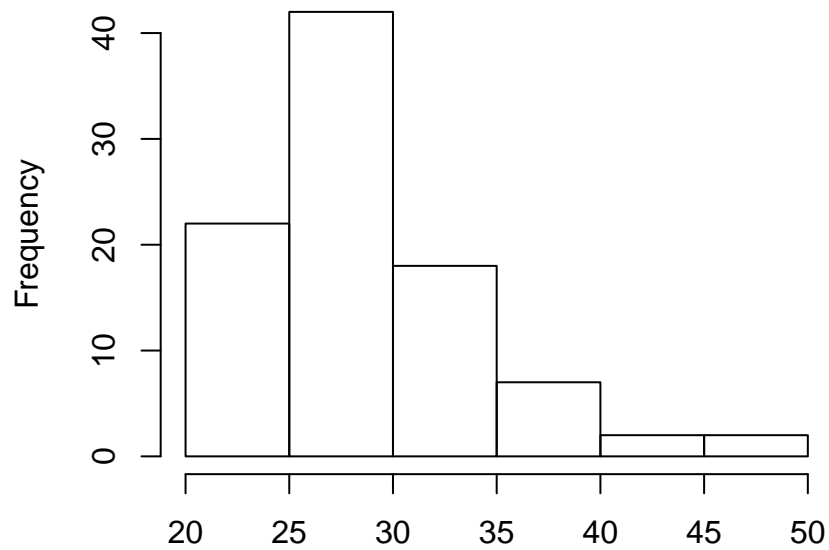


Table: MPG.city

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
15	18	21	22.37	25	46

[1]

MPG.highway



[1]

MPG.highway

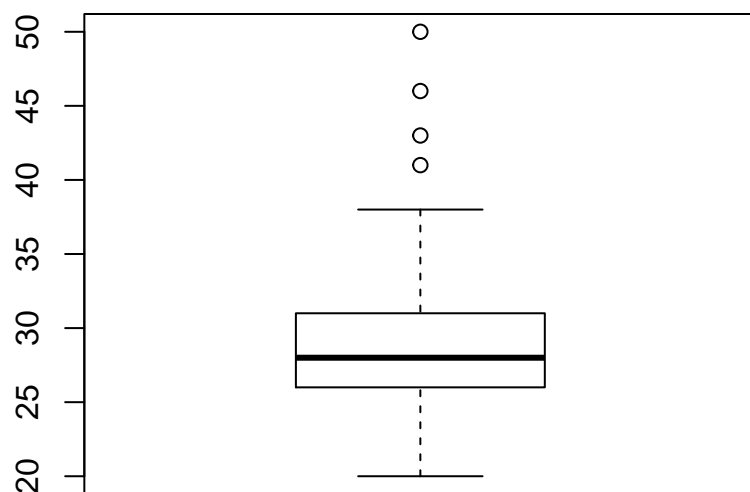
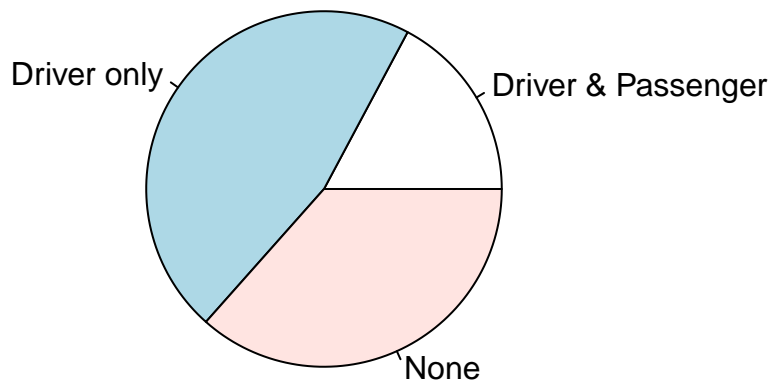


Table: MPG.highway

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
20	26	28	29.09	31	50

[1]

AirBags



[1]

AirBags

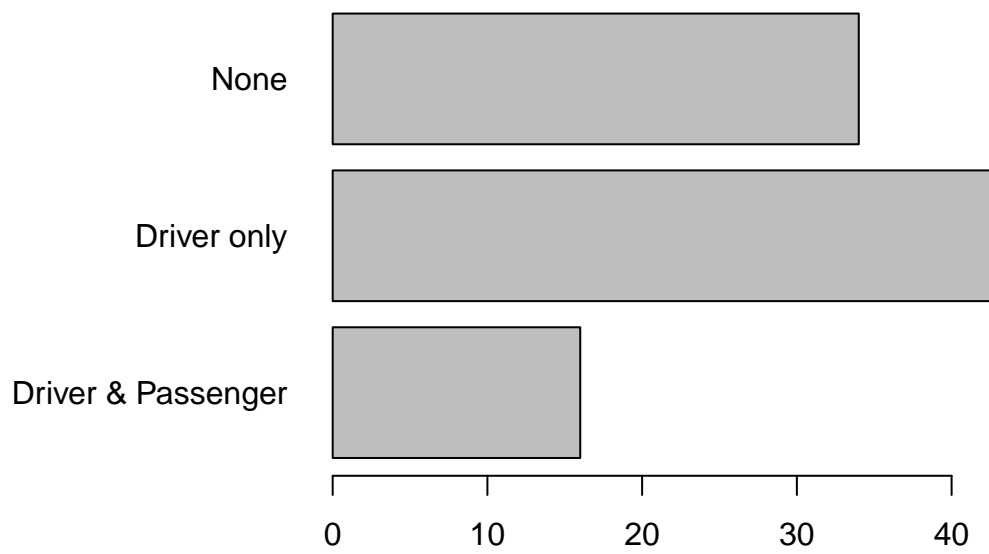
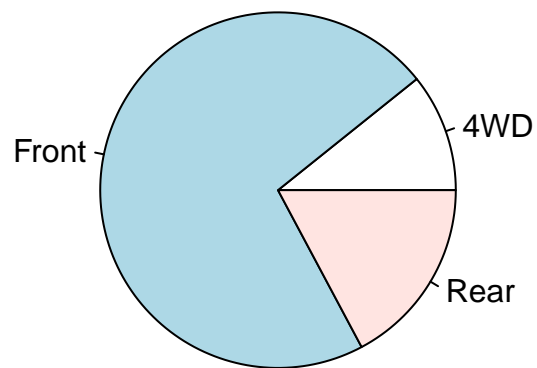


Table: AirBags

	count	percentage
Driver & Passenger	16	17.20430
Driver only	43	46.23656
None	34	36.55914

[1]

DriveTrain



[1]

DriveTrain

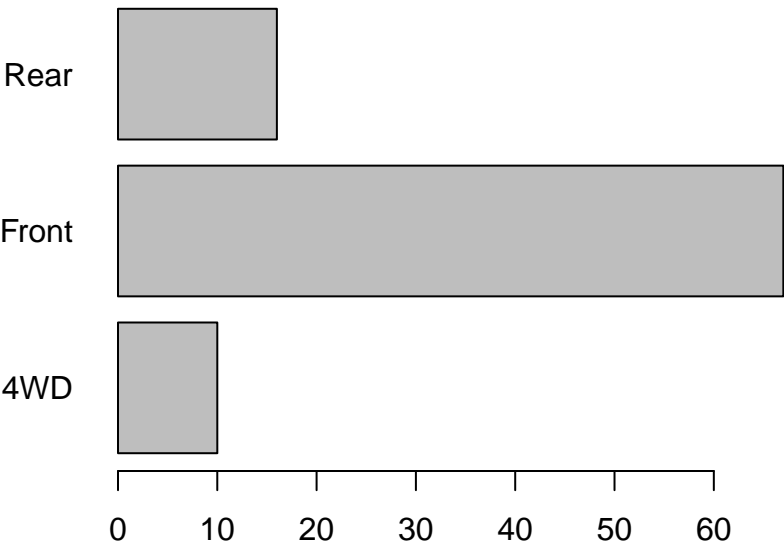
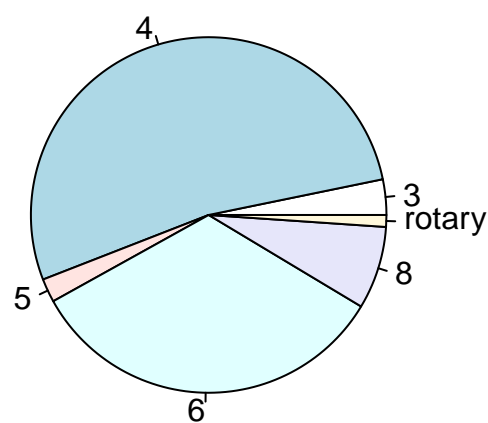


Table: DriveTrain

	count	percentage
4WD	10	10.75269
Front	67	72.04301
Rear	16	17.20430

[1]

Cylinders



[1]

Cylinders

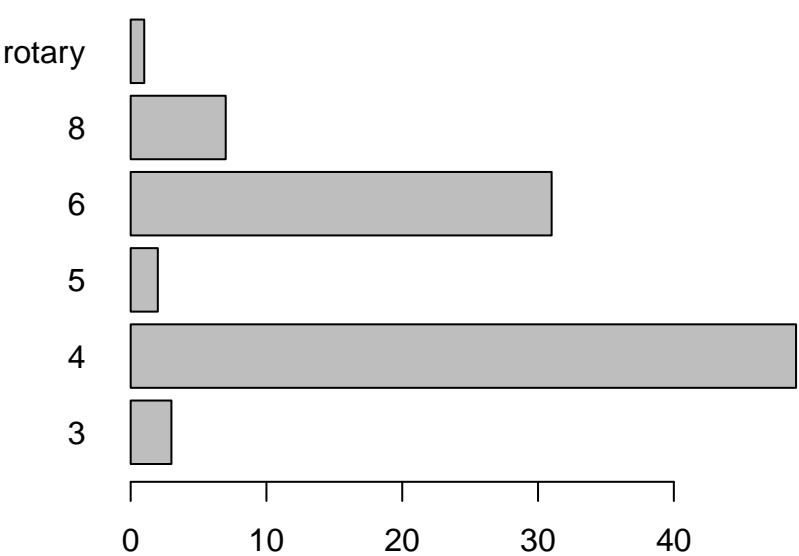
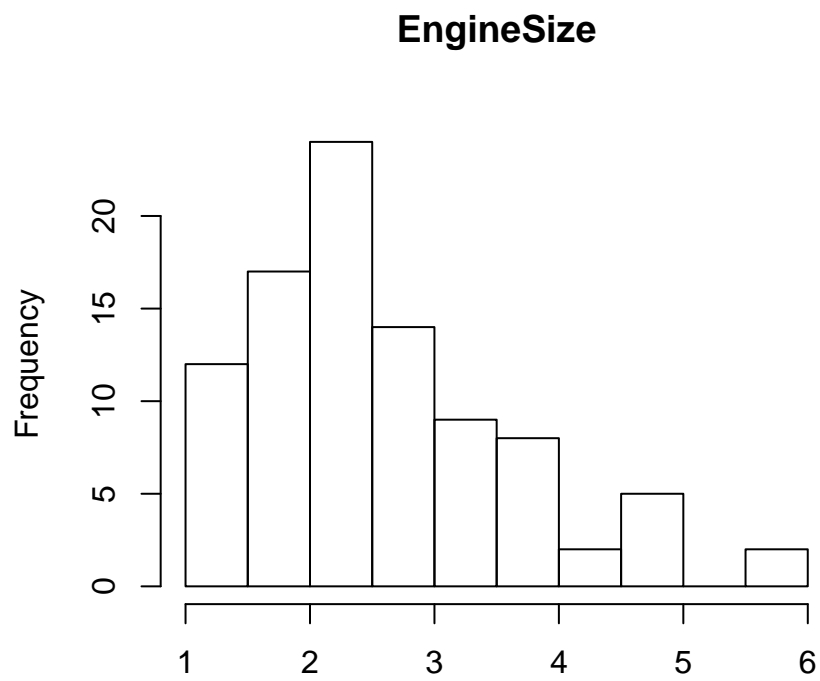


Table: Cylinders

	count	percentage
3	3	3.225807
4	49	52.688172
5	2	2.150538
6	31	33.333333
8	7	7.526882
rotary	1	1.075269

[1]



[1]

EngineSize

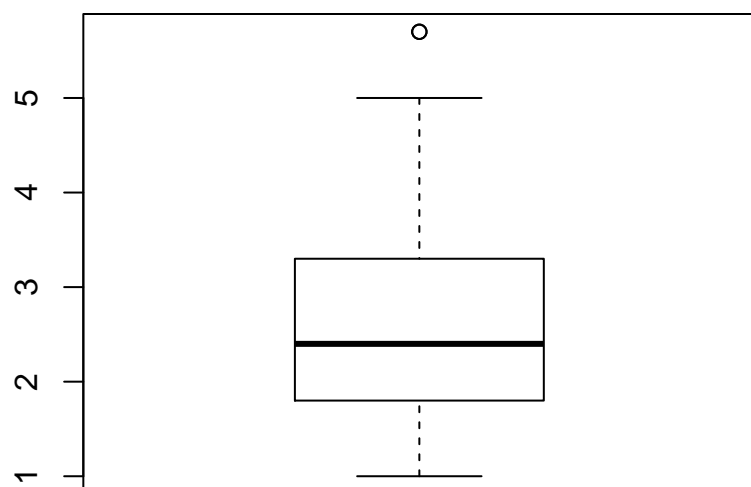
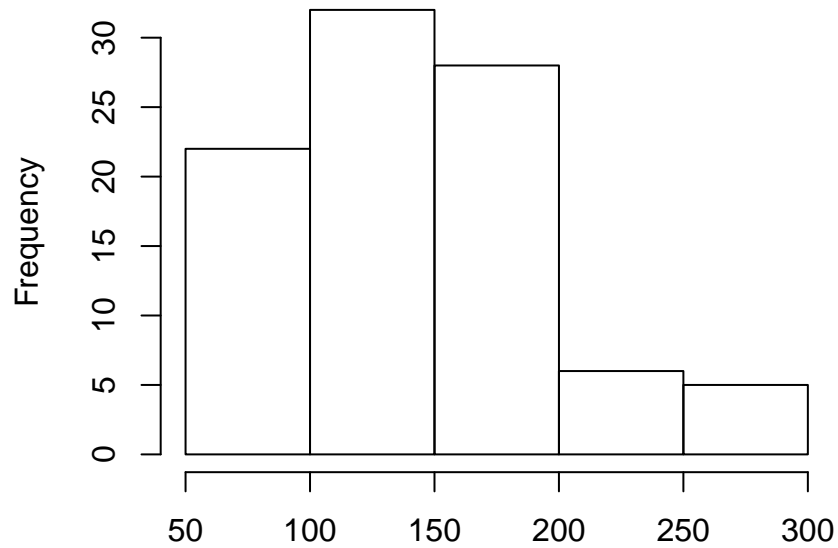


Table: EngineSize

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
1	1.8	2.4	2.668	3.3	5.7

[1]

Horsepower



[1]

Horsepower

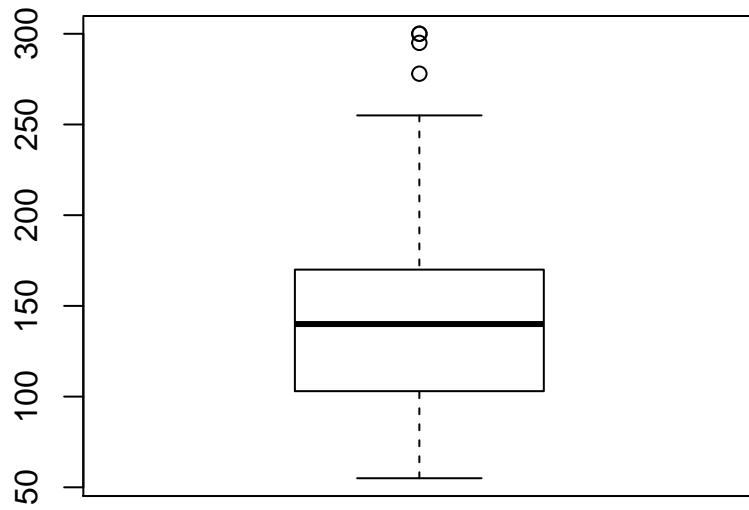
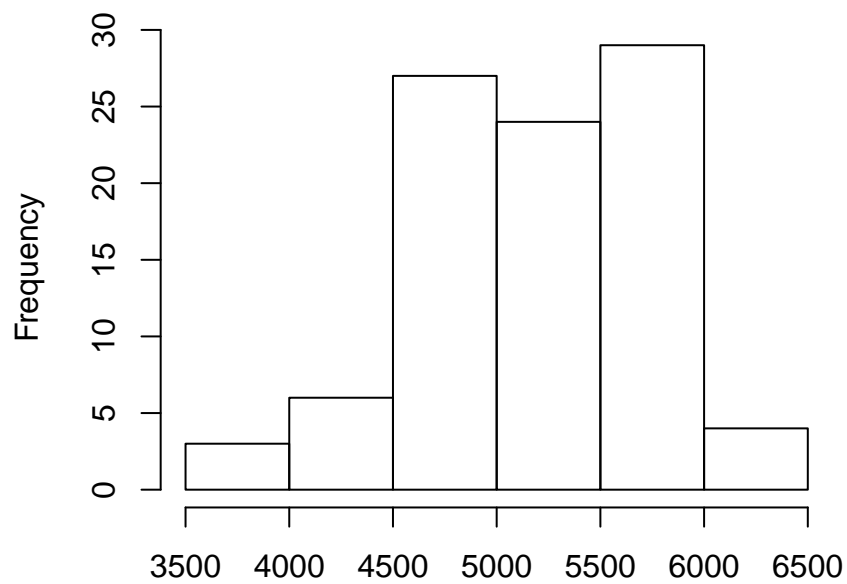


Table: Horsepower

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
55	103	140	143.8	170	300

[1]

RPM



[1]

RPM

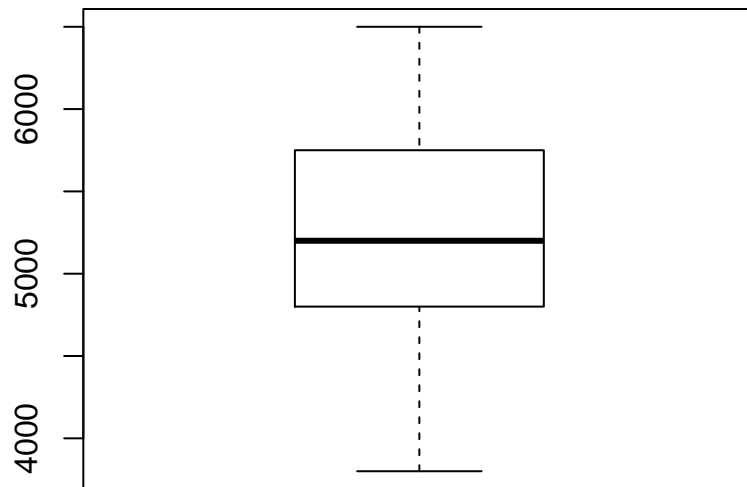
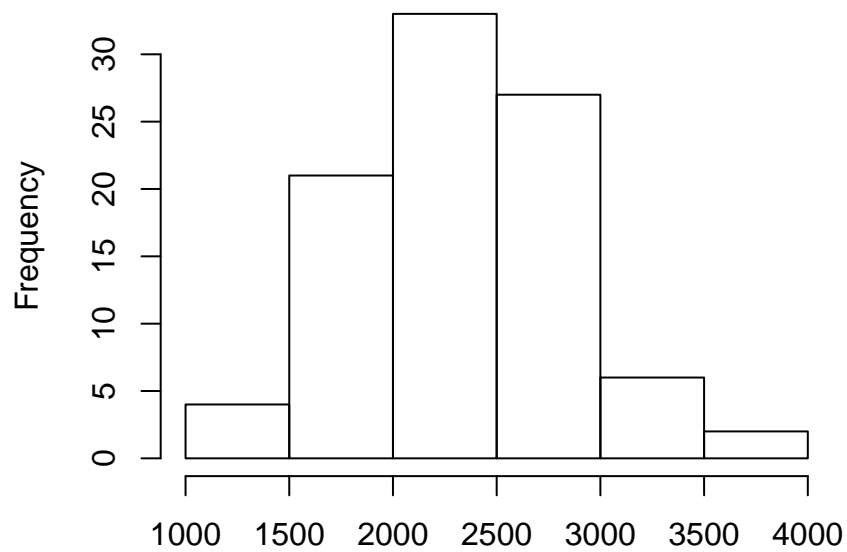


Table: RPM

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
3800	4800	5200	5281	5750	6500

[1]

Rev.per.mile



[1]

Rev.per.mile

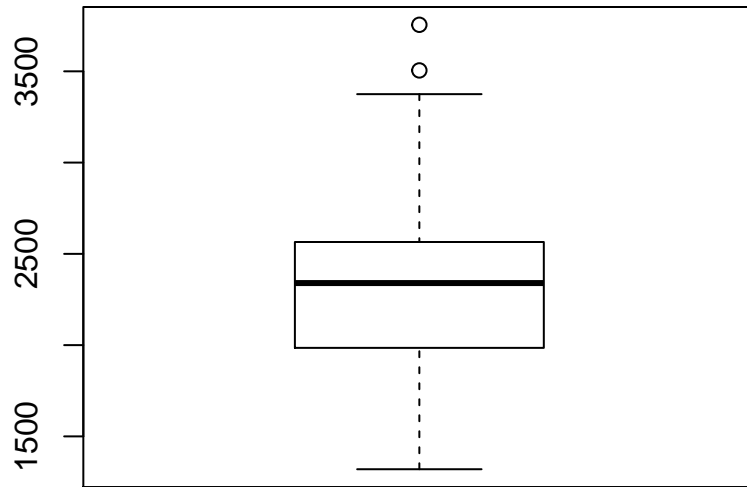
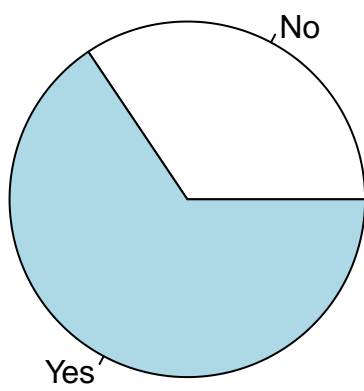


Table: Rev.per.mile

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
1320	1985	2340	2332	2565	3755

[1]

Man.trans.avail



[1]

Man.trans.avail

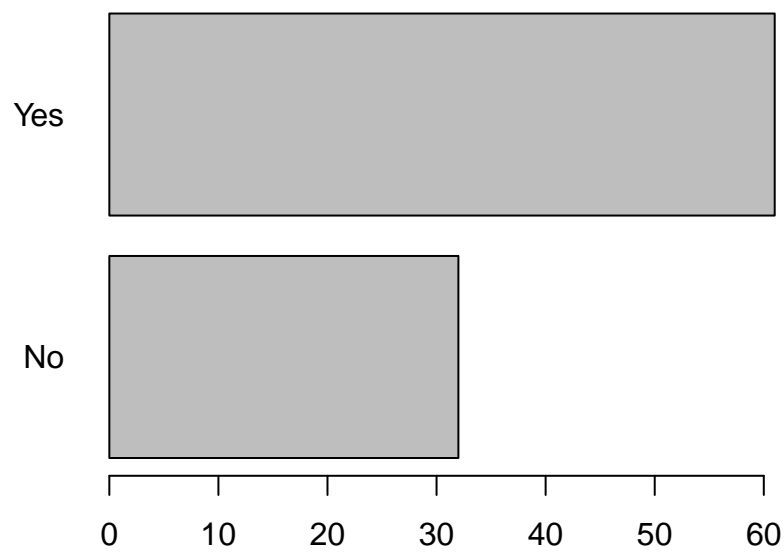
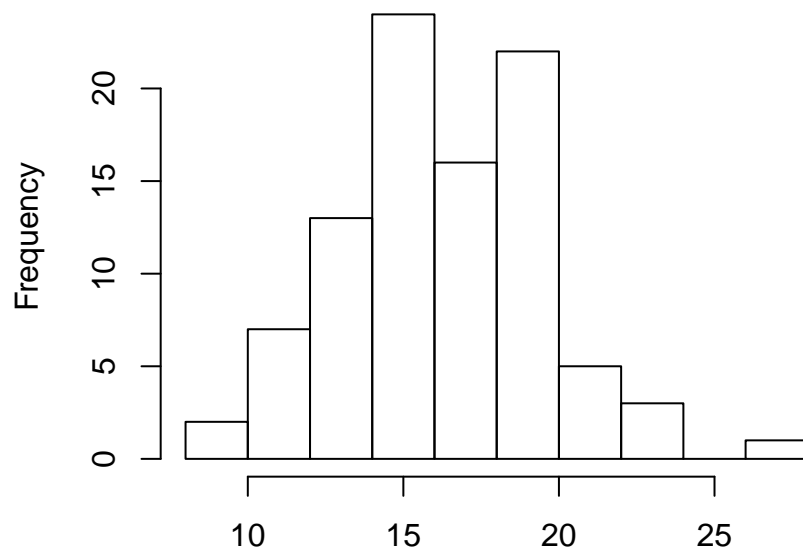


Table: Man.trans.avail

	count	percentage
No	32	34.4086
Yes	61	65.5914

[1]

Fuel.tank.capacity



[1]

Fuel.tank.capacity

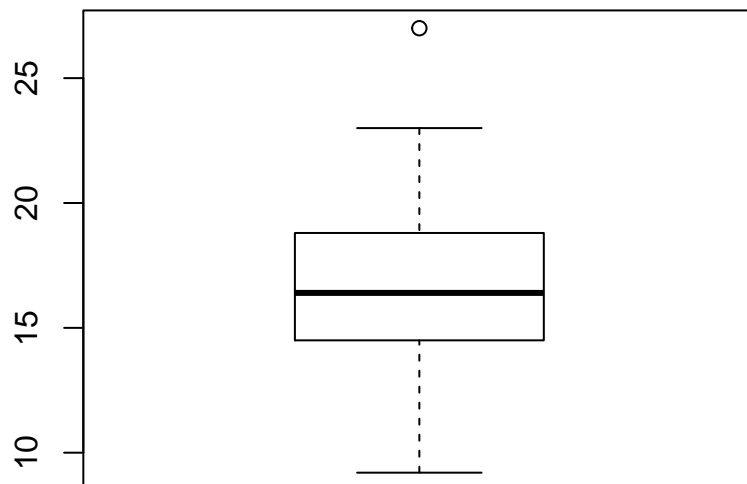
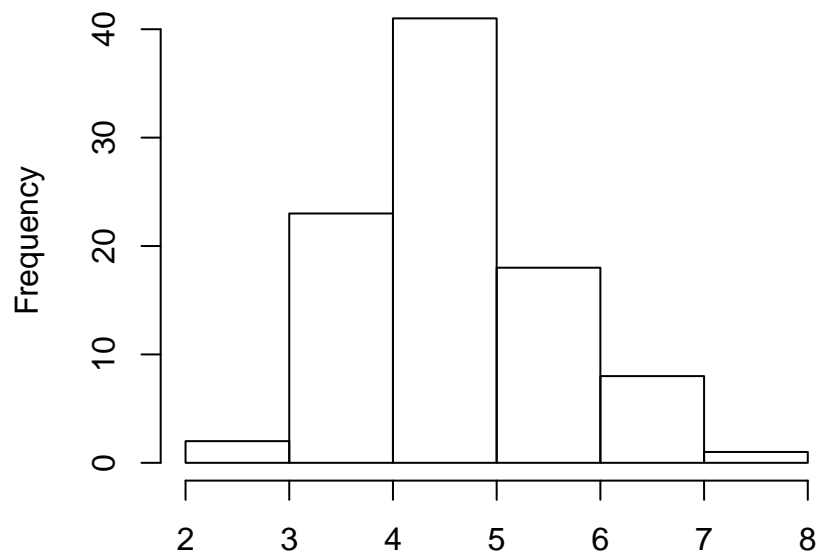


Table: Fuel.tank.capacity

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
9.2	14.5	16.4	16.66	18.8	27

[1]

Passengers



[1]

Passengers

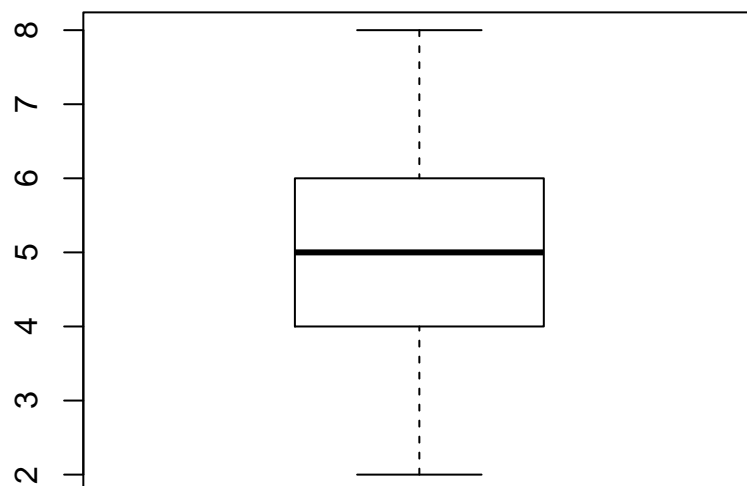
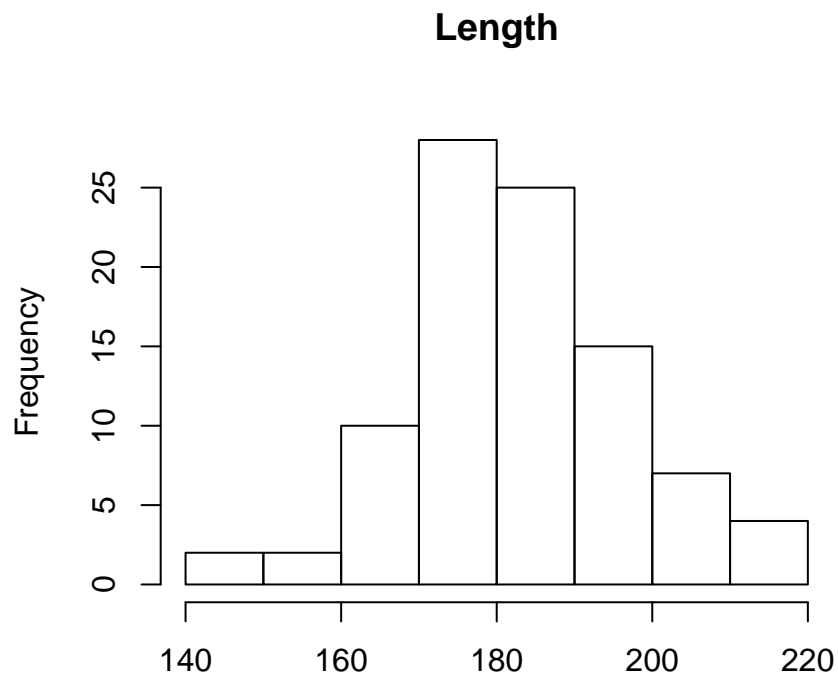


Table: Passengers

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
2	4	5	5.086	6	8

[1]



[1]

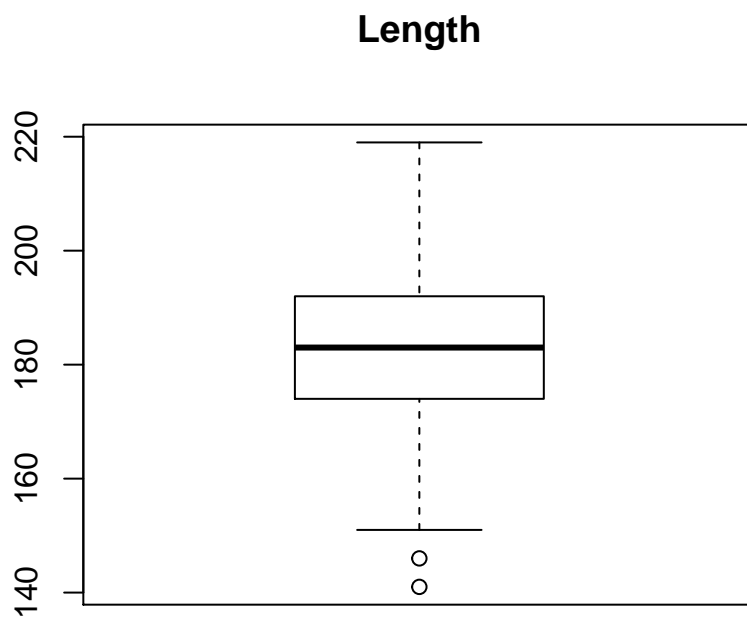
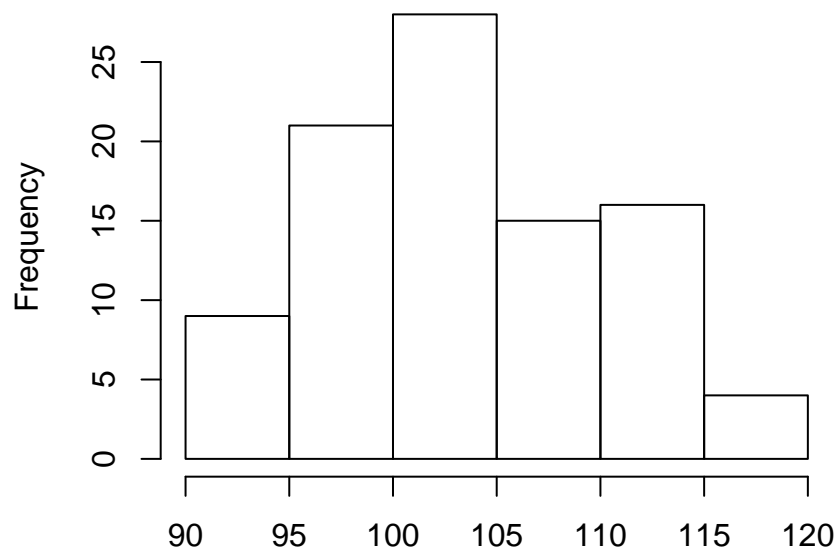


Table: Length

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
141	174	183	183.2	192	219

[1]

Wheelbase



[1]

Wheelbase

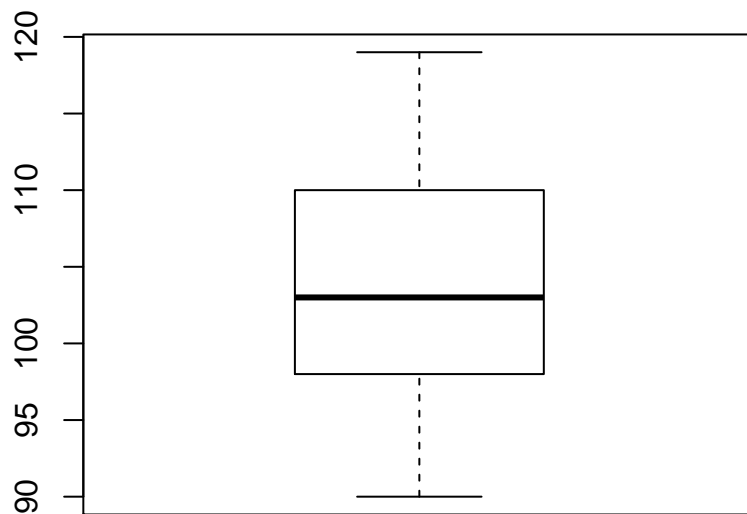
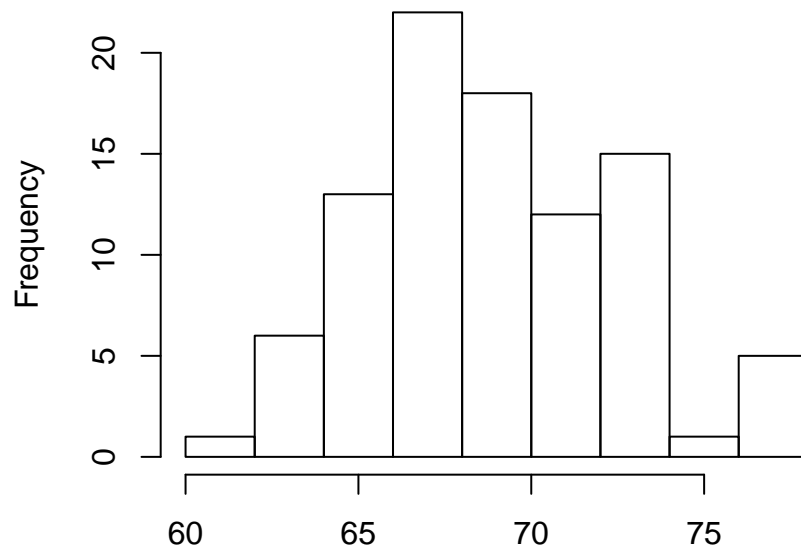


Table: Wheelbase

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
90	98	103	103.9	110	119

[1]

Width



[1]

Width

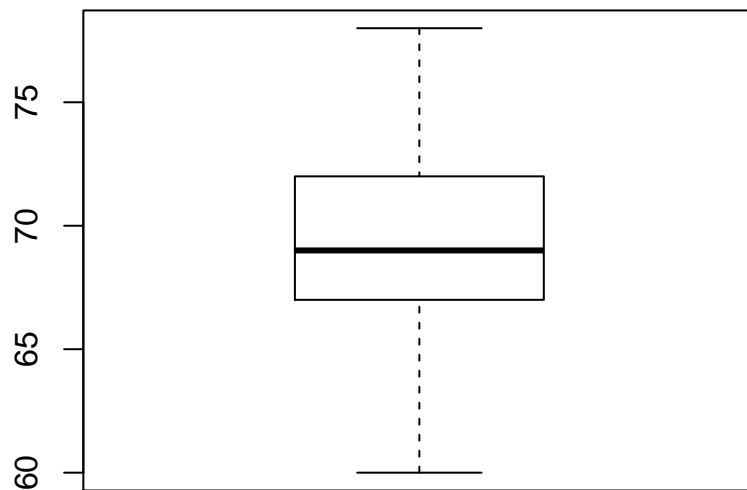
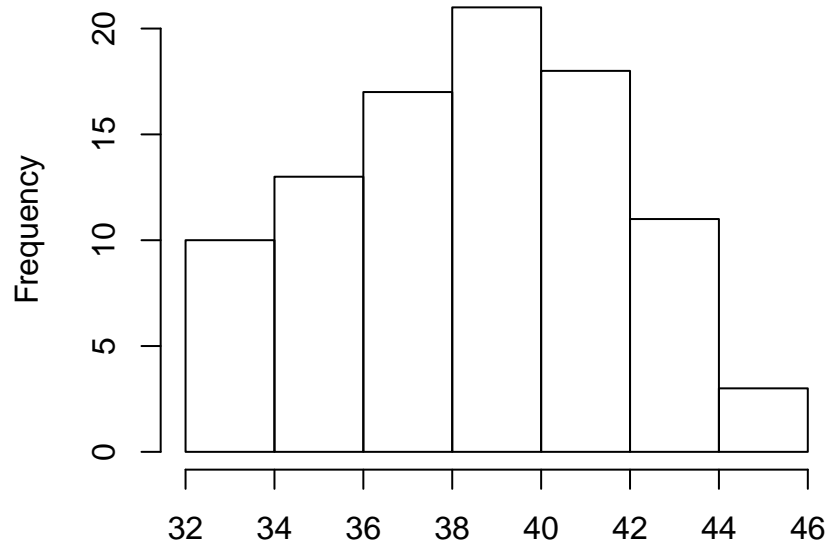


Table: Width

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
60	67	69	69.38	72	78

[1]

Turn.circle



[1]

Turn.circle

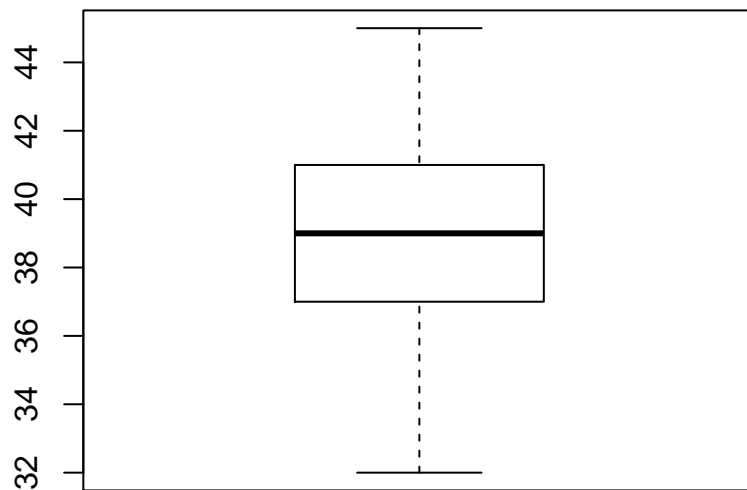
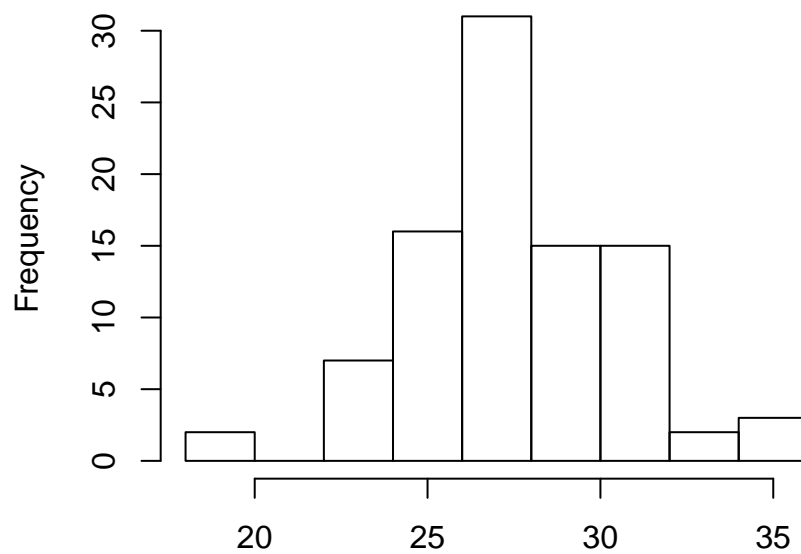


Table: Turn.circle

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
32	37	39	38.96	41	45

[1]

Rear.seat.room



[1]

Rear.seat.room

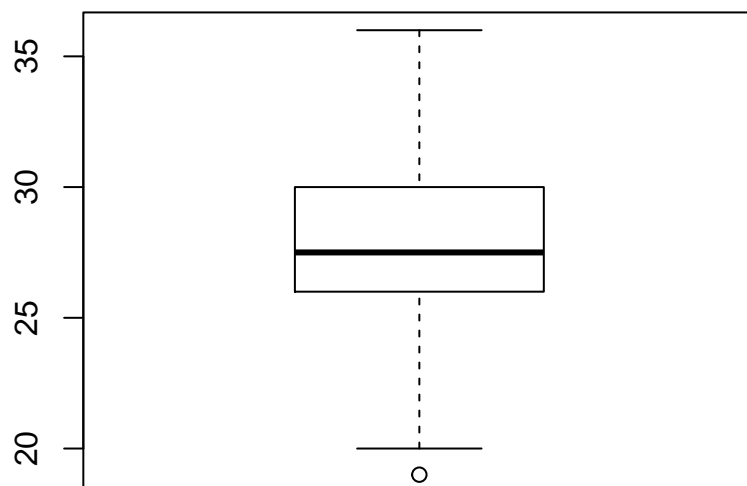
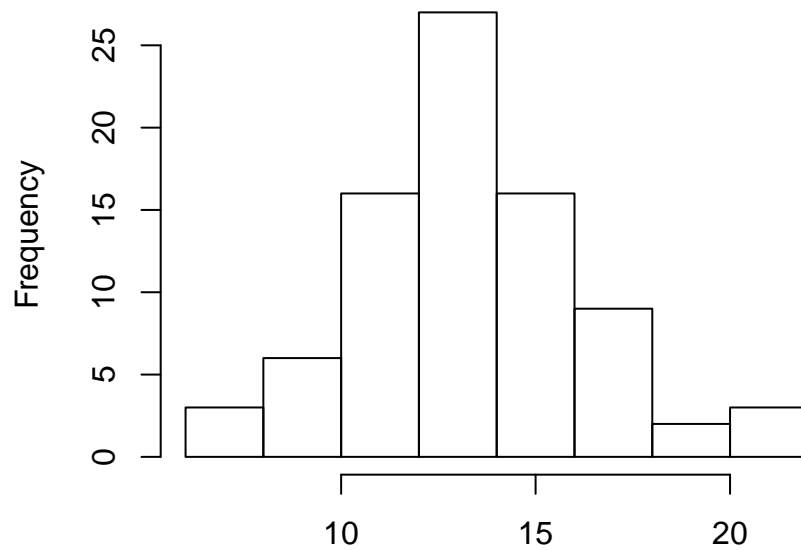


Table: Rear.seat.room

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.	NA.s
19	26	27.5	27.83	30	36	2

[1]

Luggage.room



[1]

Luggage.room

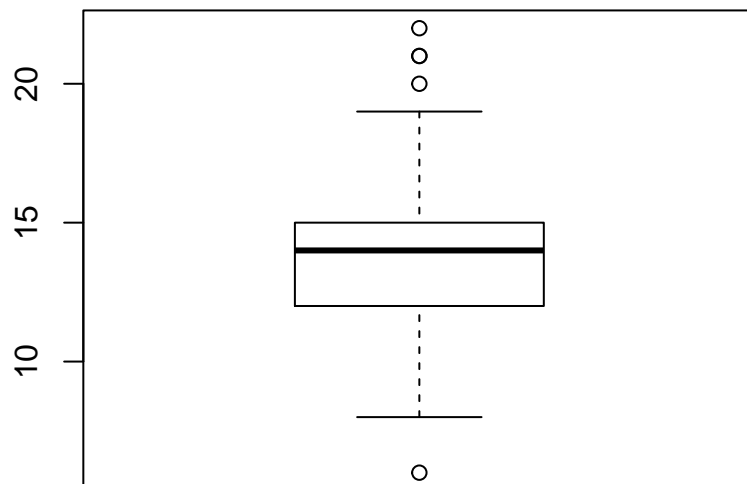
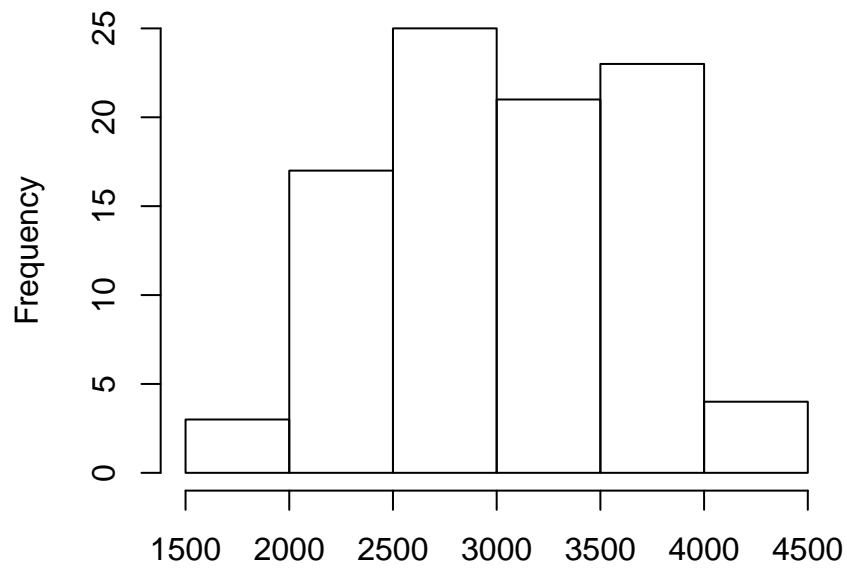


Table: Luggage.room

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.	NA.s
6	12	14	13.89	15	22	11

[1]

Weight



[1]

Weight

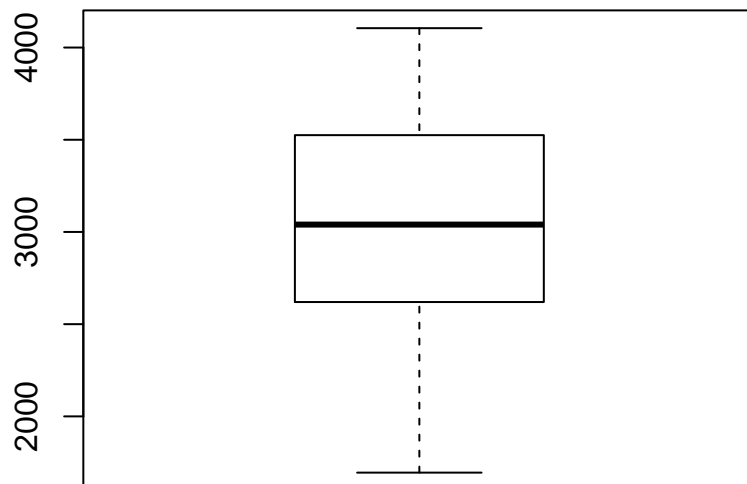
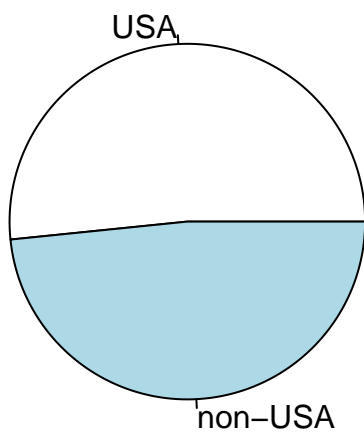


Table: Weight

Min.	X1st.Qu.	Median	Mean	X3rd.Qu.	Max.
1695	2620	3040	3073	3525	4105

[1]

Origin



[1]

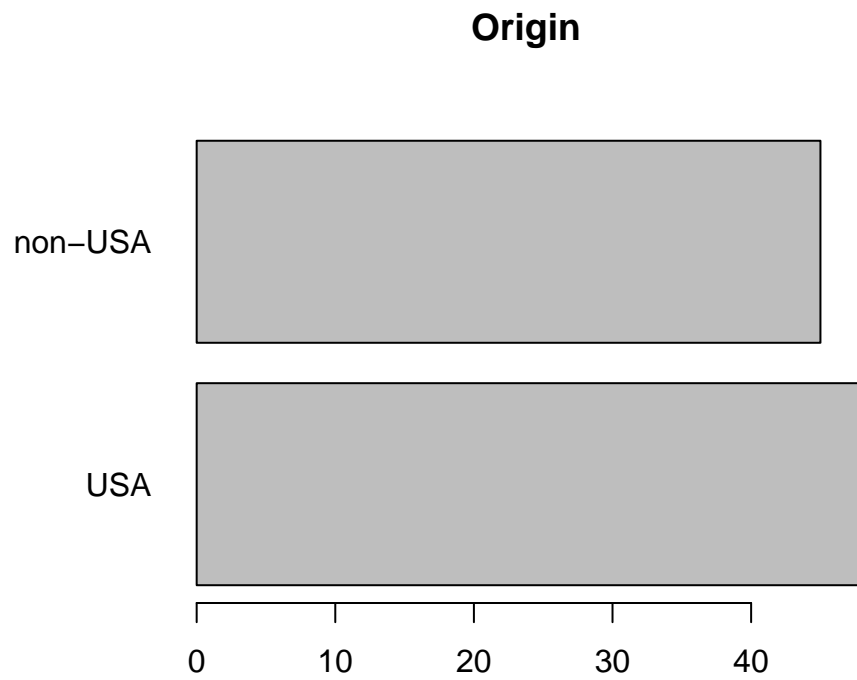
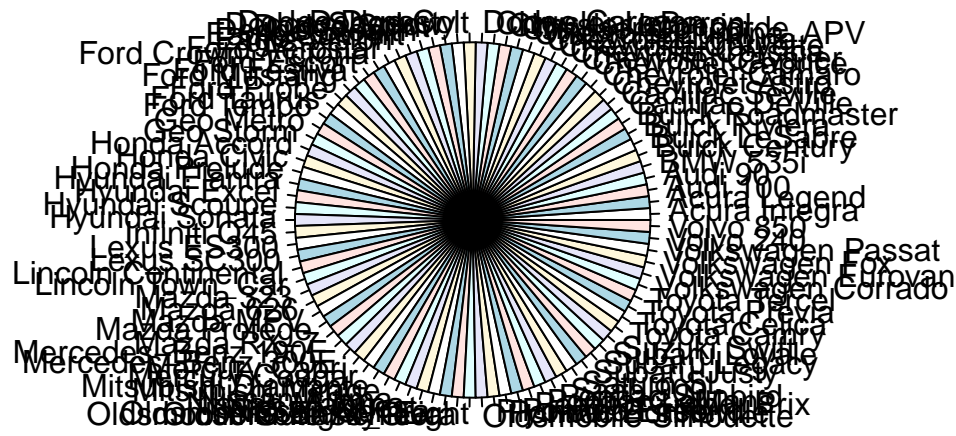


Table: Origin

	count	percentage
-----	-----	-----
USA	48	51.6129
non-USA	45	48.3871

[1]

Make



[1]

Make

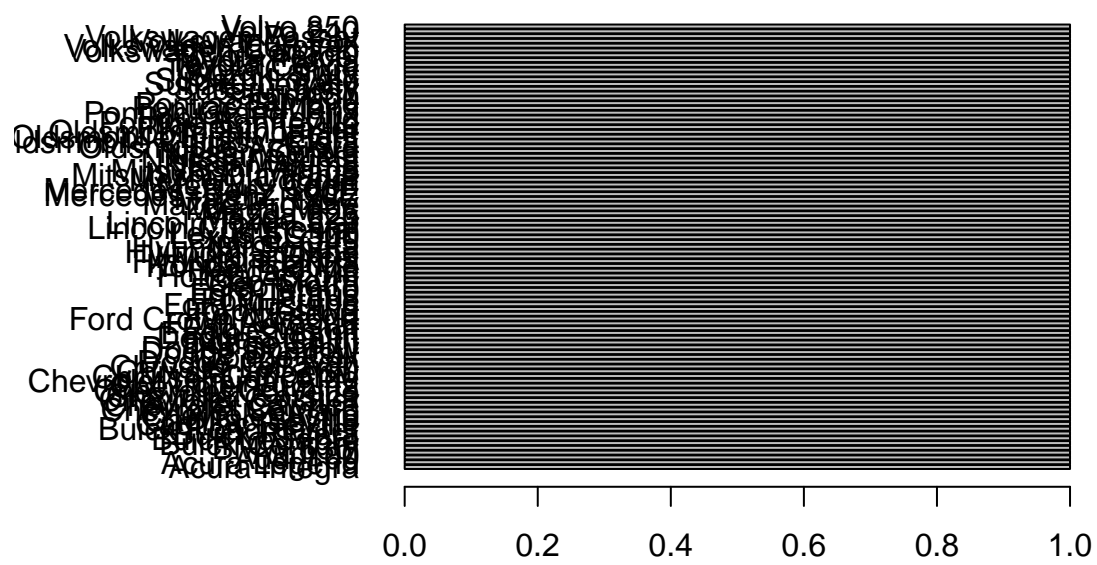


Table: Make

	count	percentage
-----	-----	-----
Acura Integra	1	1.075269
Acura Legend	1	1.075269
Audi 100	1	1.075269
Audi 90	1	1.075269
BMW 535i	1	1.075269
Buick Century	1	1.075269
Buick LeSabre	1	1.075269
Buick Riviera	1	1.075269
Buick Roadmaster	1	1.075269
Cadillac DeVille	1	1.075269
Cadillac Seville	1	1.075269
Chevrolet Astro	1	1.075269
Chevrolet Camaro	1	1.075269
Chevrolet Caprice	1	1.075269
Chevrolet Cavalier	1	1.075269
Chevrolet Corsica	1	1.075269
Chevrolet Corvette	1	1.075269
Chevrolet Lumina	1	1.075269
Chevrolet Lumina_APV	1	1.075269
Chrysler Concorde	1	1.075269
Chrysler Imperial	1	1.075269
Chrysler LeBaron	1	1.075269
Dodge Caravan	1	1.075269
Dodge Colt	1	1.075269
Dodge Dynasty	1	1.075269
Dodge Shadow	1	1.075269
Dodge Spirit	1	1.075269
Dodge Stealth	1	1.075269
Eagle Summit	1	1.075269
Eagle Vision	1	1.075269
Ford Aerostar	1	1.075269
Ford Crown_Victoria	1	1.075269
Ford Escort	1	1.075269
Ford Festiva	1	1.075269
Ford Mustang	1	1.075269
Ford Probe	1	1.075269
Ford Taurus	1	1.075269
Ford Tempo	1	1.075269
Geo Metro	1	1.075269
Geo Storm	1	1.075269
Honda Accord	1	1.075269
Honda Civic	1	1.075269
Honda Prelude	1	1.075269
Hyundai Elantra	1	1.075269
Hyundai Excel	1	1.075269
Hyundai Scoupe	1	1.075269
Hyundai Sonata	1	1.075269
Infiniti Q45	1	1.075269
Lexus ES300	1	1.075269

Lexus SC300	1	1.075269
Lincoln Continental	1	1.075269
Lincoln Town_Car	1	1.075269
Mazda 323	1	1.075269
Mazda 626	1	1.075269
Mazda MPV	1	1.075269
Mazda Protege	1	1.075269
Mazda RX-7	1	1.075269
Mercedes-Benz 190E	1	1.075269
Mercedes-Benz 300E	1	1.075269
Mercury Capri	1	1.075269
Mercury Cougar	1	1.075269
Mitsubishi Diamante	1	1.075269
Mitsubishi Mirage	1	1.075269
Nissan Altima	1	1.075269
Nissan Maxima	1	1.075269
Nissan Quest	1	1.075269
Nissan Sentra	1	1.075269
Oldsmobile Achieva	1	1.075269
Oldsmobile Cutlass_Ciera	1	1.075269
Oldsmobile Eighty-Eight	1	1.075269
Oldsmobile Silhouette	1	1.075269
Plymouth Laser	1	1.075269
Pontiac Bonneville	1	1.075269
Pontiac Firebird	1	1.075269
Pontiac Grand_Prix	1	1.075269
Pontiac LeMans	1	1.075269
Pontiac Sunbird	1	1.075269
Saab 900	1	1.075269
Saturn SL	1	1.075269
Subaru Justy	1	1.075269
Subaru Legacy	1	1.075269
Subaru Loyale	1	1.075269
Suzuki Swift	1	1.075269
Toyota Camry	1	1.075269
Toyota Celica	1	1.075269
Toyota Previa	1	1.075269
Toyota Tercel	1	1.075269
Volkswagen Corrado	1	1.075269
Volkswagen Eurovan	1	1.075269
Volkswagen Fox	1	1.075269
Volkswagen Passat	1	1.075269
Volvo 240	1	1.075269
Volvo 850	1	1.075269