

An example

TABLE 1.8 Fuel economy (miles per gallon) for model year 2001 cars

Minicompact cars			Two-seater cars		
Model	City	Highway	Model	City	Highway
Audi TT Coupe	22	31	Acura NSX	17	24
BMW 325CI Convertible	19	27	Audi TT Roadster	22	30
BMW 330CI Convertible	20	28	BMW Z3 Coupe	21	28
BMW M3 Convertible	16	23	BMW Z3 Roadster	20	27
Jaguar XK8 Convertible	17	24	BMW Z8	13	21
Jaguar XKR Convertible	16	22	Chevrolet Corvette	18	26
Mercedes-Benz CLK320	20	28	Dodge Viper	11	21
Mercedes-Benz CLK430	18	24	Ferrari Modena	11	16
Mitsubishi Eclipse	22	30	Ferrari Maranello	8	13
Porsche 911 Carrera	17	25	Honda Insight	61	68
Porsche 911 Turbo	15	22	Honda S2000	20	26
			Lamborghini Diablo	10	13
			Mazda Miata	22	28
			Mercedes-Benz SL500	16	23
			Mercedes-Benz SL600	13	19
			Mercedes-Benz SLK320	21	27
			Plymouth Prowler	17	23
			Porsche Boxster	19	27
			Toyota MR2	25	30

For two-seaters on the highway

$$\bar{x} = \frac{24 + 30 + \dots + 30}{19} = 25.8$$

1. Mean as a non-resistant measure of the distribution center. It can be severely compromised by just one outlier; long tails also make it unrepresentative. A good example is the Honda Insight.

2. The reason is that each observation is assigned the same weight.

Median

1. The median is the midpoint of the distribution.
Half the observations should be below it and the other half above it.
2. Median is a resistant and robust measure of the center.

An example:

13	13	16	19	21	21	23	23	24	26
26	27	27	27	28	28	30	30	68	

3. If the number of observations n is odd there exist an observation $\frac{n+1}{2}$ that is the center – it is the median. In our case it is 10.

The five-number summary and boxplots

Minimum Q_1 M Q_3 Maximum

It characterizes the center, spread and tails of the distribution. Its graphic illustration is a boxplot.

An example of the boxplot for highway gas mileages for
two-seaters

13 21 25 27 30

And minicompacts

22 23 25 28 31

