

# STATISTICAL INFORMATION - MEAN, MEDIAN, MODE AND RANGE

When faced with *numerical* information that is difficult to understand, it is possible to *analyse* it statistically. The following are all ways of analysing data:

**MEAN** This is what is normally used as the 'average'. It is found by adding together all the values of *a set of data*, and then dividing by the number of values.

**MEDIAN** This is the middle value of a set of data that has been *sorted* into numerical order, so that half the data has a greater value and half has a lower value.

**MODE** This is the most commonly occurring value in a set of data.

**RANGE** This is the difference between the largest and smallest values in a set of data.

**EXAMPLE:** A survey of what people spent on their main annual holiday came up with the following results.

## Family spending on their main annual holiday to the nearest hundred pounds.

£1,200	£800	£600	£1,600	£700	£1,400	£2,000	£1,500	£1,200	£1,000
£1,500	£3,200	£1,600	£2,000	£900	£1,200	£800	£400	£1,000	£1,500
£2,300	£1,200	£1,500	£1,100	£1,200	£1,600	£1,500	£600	£800	£2,100
£1,000	£1,800	£1,200	£500	£600	£2,200	£1,600	£1,300	£1,400	£1,200
£1,600	£2,200	£2,000	£1,300	£1,500	£1,300	£1,200	£1,000	£1,200	£600

The information needed to be sorted into ascending or descending order before it could be analysed.

## Family spending on their main annual holiday to the nearest hundred pounds.

£400	£600	£900	£1,100	£1,200	£1,300	£1,500	£1,500	£1,600	£2,100
£500	£700	£1,000	£1,200	£1,200	£1,300	£1,500	£1,600	£1,800	£2,200
£600	£800	£1,000	£1,200	£1,200	£1,300	£1,500	£1,600	£2,000	£2,200
£600	£800	£1,000	£1,200	£1,200	£1,400	£1,500	£1,600	£2,000	£2,300
£600	£800	£1,000	£1,200	£1,200	£1,400	£1,500	£1,600	£2,000	£3,200

The **mode** or most common value is £1,200

Since there are 50 items in total, the **median** or middle value comes between the 25<sup>th</sup> and 26<sup>th</sup> items of data. The 25<sup>th</sup> and 26<sup>th</sup> items have different values, and the median is half way between them. Its value is  $\frac{£1,200 + £1,300}{2} = \frac{£2,500}{2} = £1,250$

The **mean** is the total costs of the holidays, divided by the number holidays. The holidays cost £66,700 in total, and there were 50 families surveyed; so the mean cost was  $£66,700 / 50 = £1,340$ .

The **range** is the difference between £3,200 and £400, which is £2,800.

### EXERCISE1

**Find the mean, median, mode and range for the following examples.**

1. The wages of the employees of a small firm were.

£11,200	£11,200	£11,200	£11,800
£12,400	£12,400	£13,000	£15,400
£18,000	£18,000	£20,700	

2. The weekly numbers of visitors to a theme park over the Summer were

Week	Visitors	Week	Visitors	Week	Visitors
1	<b>9,000</b>	6	<b>17,000</b>	11	<b>16,000</b>
2	<b>11,000</b>	7	<b>16,000</b>	12	<b>14,000</b>
3	<b>10,000</b>	8	<b>18,000</b>	13	<b>14,000</b>
4	<b>13,000</b>	9	<b>20,000</b>		
5	<b>15,000</b>	10	<b>16,000</b>		

3. The average delay in minutes for aircraft taking off from an airport during a day were

15	27	10	16	15	15
32	33	28	15	22	44
45	18	17	33	10	28
16	20	10	47	40	10
10	35	65	52	75	15

### Glossary

*Numerical* This means in the form of numbers

*Analyse*. This means to break down to find information and patterns from the data.

*A set of data*. This is the information collected from an investigation. All the information should be in the same format and based on similar methods of collection.

*Sorted*. This means arranged in ascending or descending order of value.