

Example 1 Probability

1. What is the probability of throwing 1 dice and getting
 - a. 3 **ANS. $1/6 = 0.167$**
 - b. Odd number **ANS. $3/6 = 0.5$**
2. What is the probability of throwing 2 dice and getting
 - a. A double **ANS. $1/6 * 1/6 \Rightarrow 0.167 * 0.167 = 0.0279$**
3. What is most likely total number from two dice?

Dice Number	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

ANS. 7

4. What is the probability of getting the most likely number from question 3. above?
ANS. $6 / 36 = 0.167$
(note. 6 different throws generate 7 with 36 possible combinations of 2 dice so $6/36$)
5. Using Excel and the RANDBETWEEN function simulate the throwing of 2 dice, adding up the values and displaying the most frequent number that occurs for
 - a. 10 throws
 - b. 100 throws
 - c. 1,000 throws
 - d. 10,000 throws
 - e. 100,000 throws

What can you say about this simulation?

ANS. As the sample size increases the occurrence of 7 as the mode increases. At 10,000 it is always 7 so increasing to 100,000 makes little difference to the result

6. From your sample throws create a chart that shows the distribution of the values
What can you say about the “shape” of this distribution?
ANS. Normal distribution pattern or bell curve

Example 2 Averages

1. *You are organising a children's party and all you know is the average age of the children is 8. What entertainment do you organise?*

Bouncy Castle/Children's Entertainer

On the day of the party 7 children turn up and their ages are in ascending order

2, 3, 4, 9, 13, 13 and 13

Have you made a mistake with the entertainment you've organised?

Yes 13 year olds stare at Bouncy Castle with arms folded.

2, 3, 4 year olds too dangerous to be catapulted into air

What additional information would have been useful and if you had this information what entertainment would you have organised?

ANS Range of ages, the most frequent age

Disco may have been more suitable for MOST of the children plus who was the party for?

Something for the toddlers to do as well. 9 year probably wishes they were 13 but act like they're 4

2. The following is a sample of student's pulse rates

Pulse-rate (beats per minute) of Students				
89	68	92	74	76
85	64	79	77	96
82	81	86	71	90
77	90	83	81	73
82	88	79	79	94
65	77	83	75	87
80	70	85	80	80
87	71	72	62	78
80	78	81	81	75
82	66	78	74	72

- a. If your pulse rate is 74 beats per minute would that seem slower or faster than most of the learner's pulse-rates?

ANS Very difficult to work out need to know where 74 sits in data set

- b. Now with the same sample sorted what would be your answer?

Pulse-rate (beats per minute) of Students				
62	64	65	66	68
70	71	71	72	72
73	74	74	75	75
76	77	77	77	78
78	78	79	79	79
80	80	80	80	81
81	81	81	82	82
82	83	83	85	85
86	87	87	88	89
90	90	92	94	96

ANS Slow

Example 3

What would be the most useful average for the following data?

Method of Transport	Number of students
Cycle	15
Foot	12
Bus	9
Motor-cycle	6
Car	5
Train	3
TOTAL	50

ANS Mode

What would be the best average for the following two sets of salaries?

X	£30,000.00	£38,000.00	£42,000.00	£57,000.00	£73,000.00
Y	£30,000.00	£38,000.00	£42,000.00	£55,000.00	£244,000.00

ANS

X Either Median or Mean

Y Median as Mean distorted by large salary

Example 4 Data Types

1. Using the Example.csv file identify at least 1 of the following

- Qualitative Value
 - a. Your chosen value is it Nominal or Ordinal?
ANS Date (Month, Quarter etc.)
Ordinal as it has an order Q1, Q2, Jan, Feb etc.
- Quantitative Value
 - a. Discrete
ANS donut_boxes, donuts, coffee etc. (Integer or whole numbers)
 - b. Continuous
ANS coffee_ounces (Decimal)

Example 5 Visualisations

1. *Choose a chart that best shows the heights of the class.*

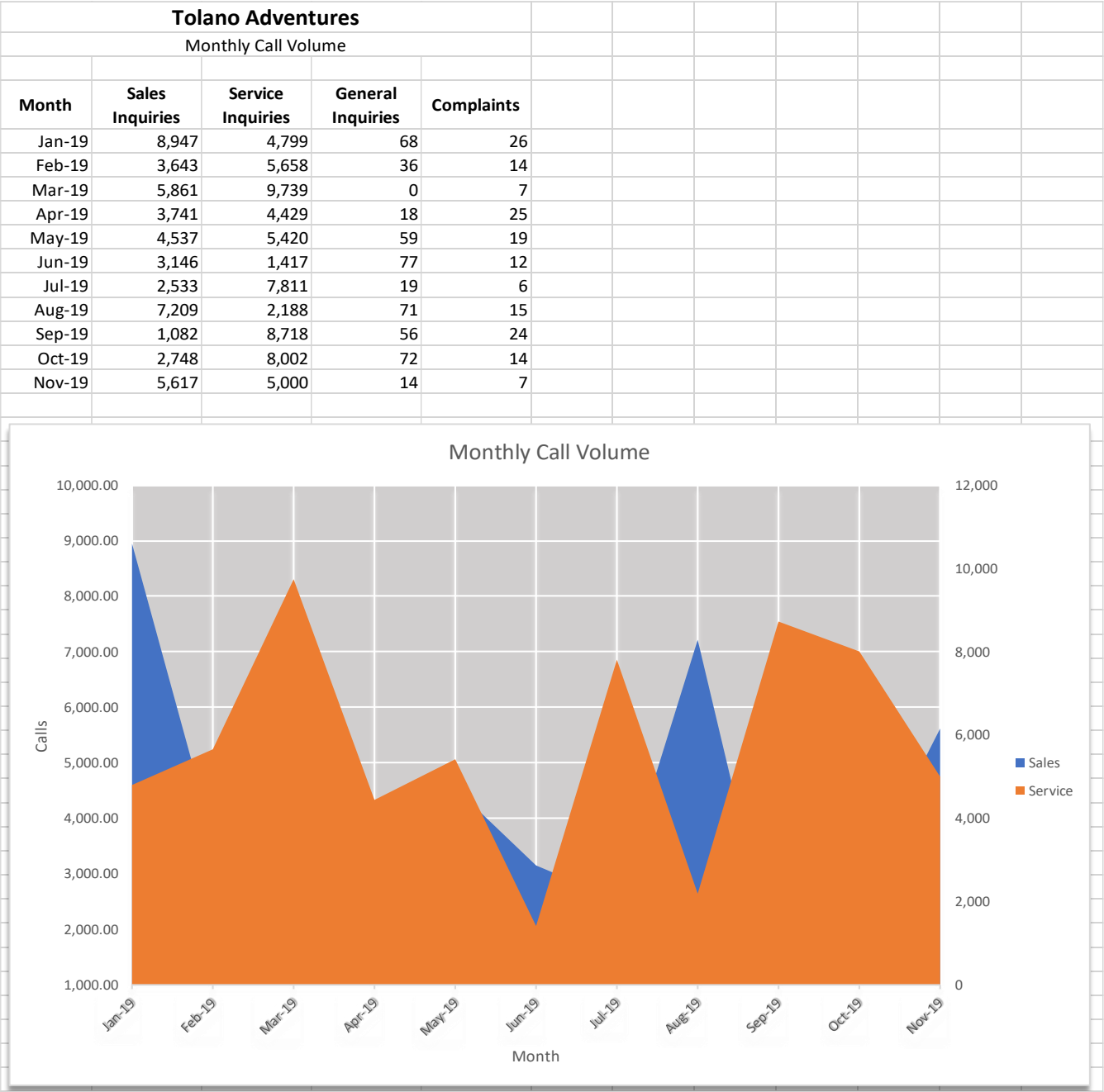
ANS Histogram with Heights categorised into ranges plus by Gender

2. *Using the data from the csv file SamplePulseRates.csv choose a chart that best shows the information.*

ANS Histogram or Box Plot (to show outliers average and quartiles)

Example 6 Visualisations

Using the following example Visualisation list as many things you think are wrong?



ANS

*Using the Workbook **ExerciseBadVisualisation.xlsx** change as many of the things you listed to improve its appearance.*

Example 7 Decision Making & Drawing Conclusions