Exercises: Statistics

1. Give three examples of discrete variables and three examples of continuous variables. Briefly explain why you think that each variable is of that type and suggest the range or possible values for each of these six variables.

2. Consider this data set: 13, 9, 7, 14, 9, 11, 18, 8, 13, 9, 10. Which **one** of these statements is true?

   (a) The mean, median, and the mode all equal 9.

   (b) The mean is 11, the median is 10, and the mode is 9.

   (c) The mean is 12, the median is 10, and the mode is 9.

   (d) The mean is 12, the median is 11, and the mode is 10.

   (e) None of the above is correct.

3. A group of twenty-five students did a test. The mean mark for the fifteen students in tutorial group A was 73%. The mean mark for the ten students in tutorial group B was 58%. What was the mean mark for the whole group of twenty-five students?

   (a) 65.5%

   (b) 66%

   (c) 67%

   (d) 67.5%

   (e) 69%

4. The number of defective components found in 50 samples of the same size is shown in this table.

No. defectives in each sample	0	1	2	3	4	5
No. samples (frequency of defectives)	5	10	10	20	5	0

   Which of the following is the mean number of defectives per sample?

   (a) 2.2

   (b) 2.4

   (c) 2.5

   (d) 8.3

   (e) 18.3

5. In a certain supermarket, customers arriving by car do so at random times. The time between arrivals (inter-arrival times) is of interest because this information can be used to predict how many checkout operators may be needed. The data has been summarised in the following table.

Class	Inter-arrival Time	No. in Group (frequency, f_i)	Class Mid-Point (t_i)	$t_i f_i$
1	$0 \leq t < 2$	8		
2	$2 \leq t < 4$	31		
3	$4 \leq t < 6$	30		
4	$6 \leq t < 8$	16		
5	$8 \leq t < 10$	9		
6	$10 \leq t < 12$	6		
	Total:			

Add a column of class mid-point values and a column to assist in the calculation of (an estimate of) the mean value. Calculate the (estimate of) the mean value.

6. Consider this set of data again: 13, 9, 7, 14, 9, 11, 18, 8, 13, 9, 10. Calculate its variance and standard deviation.

Answers

1. N/A

2. • The mean is 11, the median is 10, and the mode is 9.

3. We treat this as having fifteen marks of 73 and ten marks of 58. Then the average is $\frac{15 \times 73 + 10 \times 58}{25} = 67\%$. Be careful not to just average 73 and 58 and end up with 65.5%.

4. We calculate the mean of the grouped data as follows:

$$\frac{(0 \times 5) + (1 \times 10) + (2 \times 10) + (3 \times 20) + (4 \times 5) + (5 \times 0)}{50} = 2.2.$$

5. In a certain supermarket, customers arriving by car do so at random times. The time between arrivals (inter-arrival times) is of interest because this information can be used to predict how many checkout operators may be needed. The data has been summarised in the following table.

The mean value of the grouped data is 5.1.

6. Variance: 10.4. Standard deviation: 3.23 (2 d.p.).

Class	Inter-arrival Time	No. in Group (frequency, f_i)	Class Mid-Point (t_i)	$t_i f_i$
1	$0 \leq t < 2$	8	1	8
2	$2 \leq t < 4$	31	3	93
3	$4 \leq t < 6$	30	5	150
4	$6 \leq t < 8$	16	7	112
5	$8 \leq t < 10$	9	9	81
6	$10 \leq t < 12$	6	11	66
	Total:	100		