BECA / IB Math 02-Descriptive Statistics Name:
22 November 2021

**2.2 PreQuiz: Box and whisker plots**

1. Do Now: Determine whether each set of data is quantitative or categorical, and discrete or continuous by circling the appropriate labels.

   (a) The birth weights of 50 puppies quantitative categorical; discrete continuous

   (b) The number of students in 11.1, 11.2, 11.3
   . quantitative categorical; discrete continuous

   (c) Movie run times in minutes quantitative categorical; discrete continuous

   (d) The number of green M&Ms in each bag
   . quantitative categorical; discrete continuous

   (e) The number of patients in an ER each day for a week
   . quantitative categorical; discrete continuous

2. The forty rooms in a college dormitory are different sizes. Fifteen are singles, 15 are doubles, and 10 are triples, as shown in the table.

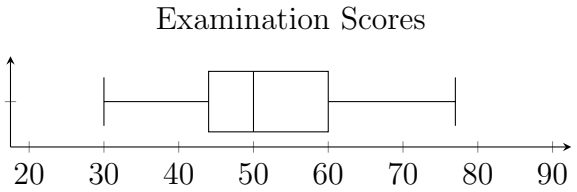
| $x$ | Frequency |
|---|---|
| 1 | 15 |
| 2 | 15 |
| 3 | 10 |

   (a) What is the capacity of the entire dormitory in terms of total students?

   (b) What is the average room size (the mean)?

   (c) Three four-person rooms (quads) are added to the dorm. What is the new mean room size?

3. The box-and-whisker plot represents the examination scores of a group of students.




(a) Write down each value: [1 mark]

i. median = ii. $Q_3$ = iii. minimum =

The range of the scores is 47 marks, and the interquartile range is 16 marks.

(b) Find the value of

i. the maximum score; [2 marks]

ii. the first quartile. [2 marks]

4. Given the following set of 15 data:

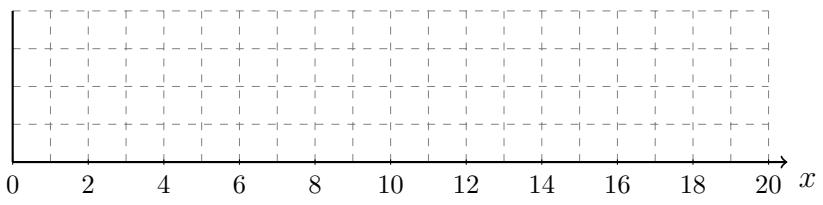
2, 4, 4, 5, 6, 8, 9, 11, 11, 11, 15, 15, 16, 17, 20

(a) Write down the mode [1 marks]

(b) Find the median. [1 marks]

(c) Find the interquartile range. [2 marks]

(d) Draw a box and whiskers plot of the data on the axis below. [2 marks]




(e) Find the mean. [2 marks]

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5. Consider the following frequency table.

| $x$ | Frequency |
|---|---|
| 10 | 2 |
| 11 | 6 |
| 12 | 11 |
| 13 | 12 |
| 14 | 8 |
| 15 | 3 |

(a) Write down the mode [1 marks]

(b) Find the value of the range. [2 marks]

(c) Find the value of the mean. [2 marks]

(d) Find the value of the standard deviation. [2 marks]

6. A box contains 100 cards. Each card has a number between one and six written on it. The following table shows the frequencies for each number.

| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Frequency | 26 | 10 | 20 | $k$ | 29 | 11 |

(a) Calculate the value of $k$. [3 marks]

(b) Find

i. the median; [2 marks]

ii. the interquartile range. [3 marks]

7. There are 250 high school students at BECA ranging in age from 13 to 18 years old. The following table shows the frequencies of each age.

| Age (years) | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|
| Frequency | 27 | 53 | 60 | 55 | 43 | 12 |

(a) Write down the mode. [1 mark]

(b) Find the value of the range. [1 marks]

(c) Find the median. [1 marks]

(d) Find the mean. [2 marks]

(e) Find the standard deviation. [2 marks]

(f) Four years later the same 250 people have moved on to college and career. Find the new values of the

i. mean; [1 marks]

ii. standard deviation. [1 marks]

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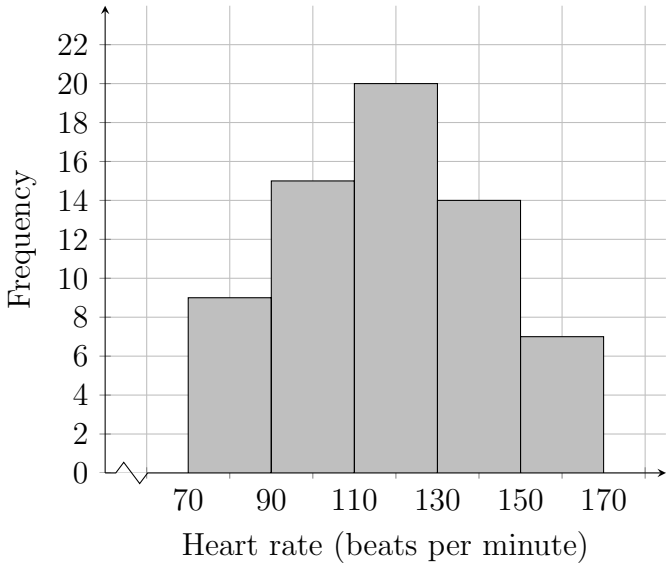
8. The histogram below shows the heart rate $x$ in beats per minute for 65 athletes after a fitness exercise.




The following is the frequency table for the distribution of $x$.

| HR ($x$) | $70 \leq x < 90$ | $90 \leq x < 110$ | $110 \leq x < 130$ | $130 \leq x < 150$ | $150 \leq x < 170$ |
|---|---|---|---|---|---|
| Freq | 9 | $p$ | 20 | 14 | 7 |

(a) Write down the value of $p$. [1 mark]

(b) Write down the modal class. [2 marks]

(c) What percentage of the athletes have a heart rate of 130 beats per minute or greater? [2 marks]

(d) Consider the class interval $70 \leq x < 90$.

i. Write down the interval width. [1 mark]

ii. Write down the mid-interval value. [1 mark]

(e) Hence find an estimate for the

i. mean; [2 marks]

ii. standard deviation. [2 marks]

9. The scores of 30 students taking an IB Paper 2 are shown in the frequency table below.

| Mark ($x$) | $10 \leq x < 30$ | $30 \leq x < 50$ | $50 \leq x < 70$ | $70 \leq x < 90$ |
|---|---|---|---|---|
| Frequency | 8 | 12 | 7 | 3 |

(a) Write down the modal class. [1 mark]

(b) Estimate the mean score $\overline{x}$. [3 marks]

(c) Estimate the standard deviation of the scores, $\sigma$. [3 marks]