Linear Interpolation

Video 52 on www.corbettmaths.com

Examples

Workout

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Question 1: Calculate an estimate of the median for each of the following

(a)

Length (x cm)	Frequency
$10 < x \leq 20$	17
$20 < x \leq 30$	26
$30 < x \leq 40$	11
$40 < x \leq 50$	6

(b)

Time (t seconds)	Frequency
$0 < t \leq 20$	4
$20 < t \leq 40$	12
$40 < t \leq 60$	19
$60 < t \leq 80$	60
$80 < t \leq 100$	5

(c)

Mass (m kg)	Frequency
$40 < m \leq 45$	64
$45 < m \leq 50$	74
$50 < m \leq 55$	155
$55 < m \leq 60$	80
$60 < m \leq 65$	26
$65 < m \leq 70$	1

(d)

Height (h cm)	Frequency
$0 < h \leq 40$	6
$40 < h \leq 80$	14
$80 < h \leq 120$	20
$120 < h \leq 160$	30
$160 < h \leq 200$	15
$200 < h \leq 240$	15

(e)

Cost (p pounds)	Frequency
$0 < p \leq 2$	40
$2 < p \leq 4$	90
$4 < p \leq 5$	80
$5 < p \leq 8$	100
$10 < p \leq 20$	120

(f)

Length (l cm)	Frequency
$0 < l \leq 50$	87
$50 < l \leq 75$	91
$75 < l \leq 100$	43
$100 < l \leq 150$	25

Question 2: For each data set above, calculate:

(a) the lower quartile
(b) the upper quartile
(c) the interquartile range

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Question 1: The table below shows information about the salaries of 120 workers from a small company.

Salary (£1000s)	Frequency
$0 < s \leq 10$	8
$10 < s \leq 20$	48
$20 < s \leq 30$	50
$30 < s \leq 50$	11
$50 < s \leq 200$	3

(a) Calculate an estimate of the mean salary

(b) Calculate an estimate of the median salary

(c) State whether the mean or the median is a better representation of the average salary a worker in the company receives.

Question 2: A shop sells two different types of lightbulb, Xtra Brite and Bright Bulbs. The lifetimes of 200 Xtra Brite bulbs, to the nearest month is shown below.

Lifetime (months)	Frequency
$0 < t \leq 12$	19
$12 < t \leq 24$	53
$24 < t \leq 36$	74
$36 < t \leq 48$	42
$48 < t \leq 120$	12

(a) Calculate an estimate of the median

(b) Calculate an estimate of the percentage of lightbulbs that last longer than 5 years

The median lifetimes of the Bright Bulbs is 30 months.
20% of the Bright Bulbs last longer than 5 years.
10% of the Bright Bulbs last less than 1 year.

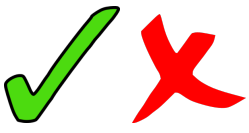
(c) By comparing their lifetimes, decide which bulb is best.

Question 3: A professor believed that second year university students spent longer revising than first year university students.

Compare the time spent revising by the 1st year and 2nd year university students.
Use an estimate of the means, an estimate of the medians and an estimate of the interquartile ranges.

Time (hours)	1st Year Frequency	2nd Year Frequency
$0 < h \leq 5$	18	0
$5 < h \leq 10$	20	7
$10 < h \leq 20$	41	63
$20 < h \leq 40$	30	54
$40 < h \leq 60$	16	9
$60 < h \leq 100$	9	1

Answers



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