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Mathematics Short E-Course
Session Four: Statistics
Exercise Sheet – Solutions

Solution 1

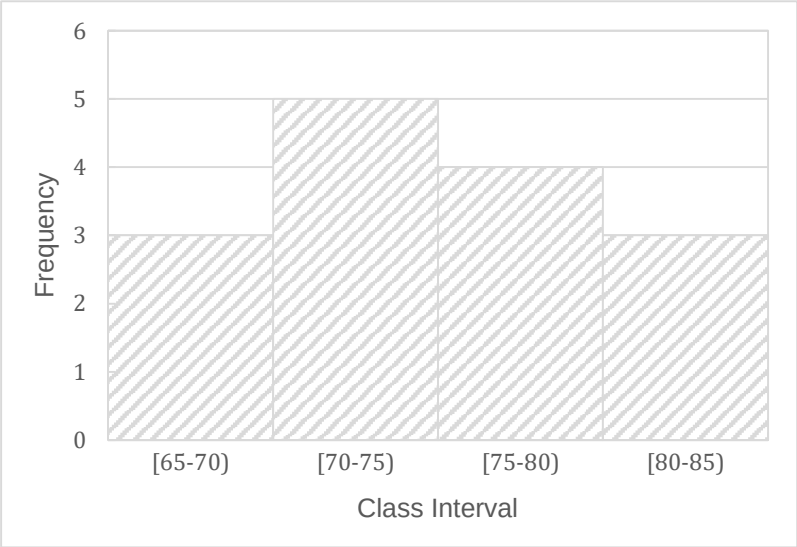
The number of items processed on a new machine was recorded on 15 occasions:

67, 75, 72, 71, 80, 79, 69, 72, 82, 70, 65, 76, 70, 83, 75

(a,b)

Class Interval	Frequency	Relative frequency (%)
[65-70)	3	3/15 x 100=20
[70-75)	5	5/15 x 100=33.3
[75-80)	4	26.7
[80-85)	3	20

(c)



Solution 2

A group of 7 pupils were given a test in mathematics. Their marks out of 20 are as shown:

9, 17, 11, 15, 15, 10, 13

Place the discrete ungrouped data in arithmetic order:

9, 10, 11, 13, 15, 15, 17

(a) Mean = 90/7 = 12.86 (correct to two decimal places)
(b) Median is the middle value = 13
(c) Mode = 15 (appears twice in the list)

Solution 3

The lengths of a batch of 100 rods were measured to the nearest centimetre.

Length	Midpoint (x_i)	Number of rods (f_i)	Cumulative Frequency	$f_i x_i$
[50-55)	52.5	10	10	525
[55-60)	57.5	20	30	1150
[60-65)	62.5	55	85	3437.5
[65-70)	67.5	15	100	1012.5

(a) $Mean = \bar{x} = \frac{6125}{100} = 61.25$

(b) The middle term must lie at N/2=100/2=50th observation, which falls in the class [60-65). This is the median class range. Hence

$$Median = 60 + 5\left[\frac{100/2 - 30}{55}\right] = 61.82$$

(c) The modal class is clearly [60-65), L=55, Δ_1=55-20=35, Δ_2=55-15=40, c=5

$$Mode = 60 + 5\left[\frac{35}{35+40}\right] = 62.3$$