

Mean of Grouped Data

Mean of a Frequency Distribution

- Approximated by

$$\bar{x} = \frac{\sum(x_m \cdot f)}{n} \quad n = \sum f$$

Use when the data is grouped in intervals rather than individual values

where x and f are the midpoints and frequencies of a class, respectively

Note: x_m refers to the midpoints of each class

Finding the Mean of a Frequency Distribution

In Words

1. Find the midpoint of each class.
2. Find the sum of the products of the midpoints and the frequencies.
3. Find the sum of the frequencies.
4. Find the mean of the frequency distribution.

In Symbols

$$x = \frac{(\text{lower limit}) + (\text{upper limit})}{2}$$

$$\Sigma(x_m f)$$

$$n = \Sigma f$$

$$\bar{x} = \frac{\Sigma(x_m f)}{n}$$

Example: Find the Mean of a Frequency Distribution Grouped Data

Use the frequency distribution to approximate the mean number of minutes that a sample of Internet subscribers spent online during their most recent session.

Class	Midpoint	Frequency, f
7 – 18	12.5	6
19 – 30	24.5	10
31 – 42	36.5	13
43 – 54	48.5	8
55 – 66	60.5	5
67 – 78	72.5	6
79 – 90	84.5	2

$$f \cdot x_m$$

$$6(12.5) = 75$$

• Approximated by

$$\bar{x} = \frac{\Sigma(x_m \cdot f)}{n}$$

What is n ?

Solution: Find the Mean of a Frequency Distribution

Class	Midpoint, x	Frequency, f	$f \cdot x_m$
7 – 18	12.5	6	$12.5 \cdot 6 = 75.0$
19 – 30	24.5	10	$24.5 \cdot 10 = 245.0$
31 – 42	36.5	13	$36.5 \cdot 13 = 474.5$
43 – 54	48.5	8	$48.5 \cdot 8 = 388.0$
55 – 66	60.5	5	$60.5 \cdot 5 = 302.5$
67 – 78	72.5	6	$72.5 \cdot 6 = 435.0$
79 – 90	84.5	2	$84.5 \cdot 2 = 169.0$
		$n = 50$	$\Sigma(x \cdot f) = 2089.0$

$$\bar{x} = \frac{\Sigma(x \cdot f)}{n} = \frac{2089}{50} \approx 41.8 \text{ minutes}$$

approx.

modal class: 31-42

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modal class: 31-42

(class that has the highest frequency)

18. These data represent the net worth (in millions of dollars) of 45 national corporations.

Class limits	Frequency	x_m	$f \cdot x_m$
10–20	2	15	30
21–31	8		
32–42	15		
43–53	7		
54–64	10		
65–75	3		
$n=45$			

modal class: 32-42

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1, 3, 7, 13, 15, 17, 20



find:
mean
median
mode
midrange



find:
mean
modal class