

Q1: Understanding Central Tendency (Easy)

A bakery tracks the daily sales of muffins (in dozens) over a week: [10, 12, 11, 15, 14, 13, 12]. What is the most representative value of their weekly sales, and why?

Data (sorted): 10, 11, 12, 12, 13, 14, 15

- Mean : $87 \div 7 = 12.43$
- Median : 12
- Mode : 12

Best representative value: 12 , The median and mode are both 12, which reflects a typical day's sales. The mean is slightly higher because of the larger values (14 and 15), so 12 best represents the bakery's usual weekly muffin sales.

Q2: Mean in Real Life (Easy)

A teacher records the marks of her students in a short quiz: [12, 15, 14, 16, 18, 20, 19]. What is the mean score, and what does it tell us about the class's performance?

Marks: [12, 15, 14, 16, 18, 20, 19]

Mean

$$\frac{12 + 15 + 14 + 16 + 18 + 20 + 19}{7} = \frac{114}{7} = 16.29$$

The average score is about 16.3 marks, showing the class performed fairly well overall, with most students scoring in the mid-to-high range.

Q3: Mode in Real Life (Easy)

A store records the shoe sizes sold in one day: [7, 8, 9, 8, 8, 10, 7, 9]What is the mode, and why is this information useful for the store manager?

Shoe sizes: [7, 8, 9, 8, 8, 10, 7, 9]

Mode: 8

Size 8 is the most popular. The store manager can stock more of this size to meet customer demand and avoid shortages.

Q4: Median in Real Life (Medium)

A car dealer notes the prices of used cars: [\$8,000, \$9,500, \$10,200, \$11,000, \$50,000]. Why is the median a better measure than the mean in this case? Calculate the median.

Car prices: [\$8,000, \$9,500, \$10,200, \$11,000, \$50,000]

Median: \$10,200

The \$50,000 car is an outlier and would distort the mean. The median represents a typical used car price more accurately.

Q5: Dispersion Introduction (Medium)

A student times how long it takes to finish a puzzle each day: [25, 30, 27, 35, 40]. What does the range tell us about the variation in the student's puzzle-solving time?

Times (minutes): [25, 30, 27, 35, 40]

Range ($40 - 25 = 15$ minutes)

The student's puzzle-solving time varies by 15 minutes, showing noticeable inconsistency.

Q6: Range in Action (Medium)

A farmer records the weekly weight of harvested apples (kg): [100, 105, 98, 110, 120]. Find the range. How can this help the farmer in planning his packaging?

Apple weights (kg): [100, 105, 98, 110, 120]

Range ($120 - 98 = 22$)

Knowing the variation helps plan flexible packaging and storage to handle lighter and heavier harvests.

Q7: Variance for Decision-Making (Medium)

**Two delivery companies track delivery delays (in minutes). Company A: variance = 6
Company B: variance = 15 , Which company is more consistent, and why?**

- Company A: variance = 6
- Company B: variance = 15

More consistent: Company A because Lower variance means less fluctuation in delivery delays.

Q8: Standard Deviation in Context (Hard)

A finance student compares the daily price fluctuations of two cryptocurrencies. Coin A: standard deviation = \$30 Coin B: standard deviation = \$120, Which coin is riskier to invest in, and why?

- Coin A: SD = \$30
- Coin B: SD = \$120

Riskier investment: Coin B because Higher standard deviation means larger price swings, so higher risk.

Q9: Combining Measures (Hard)

A family records their monthly electricity usage (in kWh): [400, 420, 390, 450, 410]. Assignment Questions Pwskills Find the mean and standard deviation. What do these values together tell you about the family's energy use pattern?

Electricity usage (kWh): [400, 420, 390, 450, 410]

$$\text{Mean} = \frac{400+420+390+450+410}{5} = 414$$

Standard Deviation (population)

- Deviations: -14, 6, -24, 36, -4
- Squared deviations: 196, 36, 576, 1296, 16
- Variance: $\frac{2120}{5} = 424$
- SD: $\sqrt{424} \approx 20.6$

The family uses about 414 kWh per month, with moderate variation, showing fairly stable energy usage.

Q10: Practical Application (Hard)

A basketball player's points in 8 games are recorded: [15, 18, 20, 22, 25, 17, 19, 21], Find the mean, median, mode, range, and standard deviation. What insights can these measures provide about the player's scoring performance?

Points scored: [15, 18, 20, 22, 25, 17, 19, 21]

$$\text{Mean} = \frac{157}{8} = 19.63$$

Median

Sorted data: 15, 17, 18, 19, 20, 21, 22, 25

$$= \frac{19+20}{2} = 19.5$$

Mode = No mode

$$\text{Range} = 25 - 15 = 10$$

Standard Deviation (population)

- $\text{SD} \approx 3.1$

Insights:

- The player averages about 20 points per game
- Scores are consistent (low SD)
- No extreme highs or lows
- Reliable scoring performance