A transportation company wants to analyze the fuel efficiency of its vehicle fleet toidentify any variations across different vehicle models.

Data: Let's consider the fuel efficiency (in miles per gallon, mpg) for a sampleof50 vehicles:

Model A:

30, 32, 33, 28, 31, 30, 29, 30, 32, 31,

Model B:

25, 27, 26, 23, 28, 24, 26, 25, 27, 28,

Model C:

22, 23, 20, 25, 21, 24, 23, 22, 25, 24,

Model D:

18, 17, 19, 20, 21, 18, 19, 17, 20, 19,

Model E:

35, 36, 34, 35, 33, 34, 32, 33, 36, 34

Questions:

1. Measure of Central Tendency: What is the average fuel efficiency for each vehicle model?
2. Measure of Dispersion: What is the range of fuel efficiency for each vehicle model?
3. Measure of Dispersion: What is the variance of the fuel efficiency for each vehicle model?

**Fuel‑efficiency data (mpg)**

**Model A :** 30, 32, 33, 28, 31, 30, 29, 30, 32, 31

**Mean:** 30.6

**Range:** 33 – 28 = 5

**Variance:** 2.04

**Model B : 25, 27, 26, 23, 28, 24, 26, 25, 27, 28**

**Mean: 25.9**

**Range: 28 – 23 = 5**

**Variance: 2.49**

**Model C : 22, 23, 20, 25, 21, 24, 23, 22, 25, 24**

**Mean: 22.9**

**Range: 25 – 20 = 5**

**Variance: 2.49**

**Model D : 18, 17, 19, 20, 21, 18, 19, 17, 20, 19**

**Mean: 18.8**

**Range: 21 – 17 = 4**

**Variance: 1.56**

**Model E : 35, 36, 34, 35, 33, 34, 32, 33, 36, 34**

**Mean: 34.2**

**Range: 36 – 32 = 4**

**Variance: 1.56**

|  |  |
| --- | --- |
| **Mean** | **The typical fuel‑efficiency (on average) that each model delivers.** |
| **Range** | **The spread between the best‑ and worst‑efficiency vehicles of that model.** |
| **Variance** | **The squared‑unit spread around the mean; a lower variance means the vehicles of that model are more consistent in fuel economy.** |

**Implications for fleet management**

* **Model A** (≈ 30.6 mpg) is the most fuel‑efficient and has a small variance (≈ 2 mpg²), so the fleet can rely on it for predictable consumption.
* **Models B & C** have slightly lower averages (≈ 25.9 mpg and 22.9 mpg) and similar variances (≈ 2.5 mpg²). They are less efficient and show more variability than Model A.
* **Model D** (≈ 18.8 mpg) is the least efficient and has the smallest range (4 mpg) but still a modest variance (≈ 1.6 mpg²).
* **Model E** (≈ 34.2 mpg) delivers the highest fuel‑efficiency with the smallest variance (≈ 1.6 mpg²), making it the most reliable for fuel‑consumption planning.