Assignment Answer

Question 3:

If μ = 55, σ$_a$ = 4, σ$_β$ = 10, σ$_c$ = 15, which is better?

Solution:

Given Data:

Parameter	Value
Mean (μ)	55
Standard Deviation of A (σ$_a$)	4
Standard Deviation of B (σ$_β$)	10
Standard Deviation of C (σ$_c$)	15

Concept Used:

When comparing different datasets or processes that have the **same mean**, the **standard deviation (σ)** is used to measure variability or dispersion.

> "The higher the value for the standard deviation, the more spread out the values are in a sample." [[12]]

A **lower standard deviation** indicates:

- ✅ Less variability in the data
- ✅ Greater consistency and precision
- ✅ More reliable/predictable outcomes

Comparison:

Since all three options share the same mean (μ = 55), we directly compare their standard deviations:

Option	Standard Deviation (σ)	Interpretation
A	**4**	Least spread, most consistent ✅
B	10	Moderate spread

Option	Standard Deviation (σ)	Interpretation
C	15	Greatest spread, least consistent

Coefficient of Variation (Optional Verification):

To further confirm, we calculate the Coefficient of Variation (CV = $\sigma/\mu \times 100\%$):

- CV_a = (4/55) × 100 = **7.27%**

- CV_β = (10/55) × 100 = **18.18%**

- CV_c = (15/55) × 100 = **27.27%**

> "The coefficient of variation is a relative measure of variability that indicates the size of a standard deviation in relation to its mean." [[13]]

Lower CV = Better relative consistency.

Conclusion:

✅ **Option A (σ_a = 4) is the best choice** because it has the **lowest standard deviation** and **lowest coefficient of variation**, indicating the least variability and highest consistency around the mean of 55.

Answer: A is better.