**Calculation of Arithmetic Mean in an Individual Series (Short-Cut Method)**

The **short-cut method** (also known as the **step deviation method**) is a quicker way to calculate the arithmetic mean, especially when dealing with large datasets. This method reduces the complexity of calculations by using a **deviation from a chosen average** (usually the mean or a number close to the central value).

**Steps to Calculate the Arithmetic Mean in an Individual Series (Short-Cut Method)**

The **short-cut method** (also called the **step deviation method**) simplifies the calculation of the arithmetic mean by reducing the need for large additions and subtractions. Here are the steps:

**Step-by-Step Procedure:**

1. **Arrange the Data in Ascending Order**
	* Organize the data from the smallest to the largest value.
2. **Choose an Assumed Mean (A)**
	* Select a value close to the center of the data set. This helps minimize the deviations and makes calculations easier.
	* The assumed mean can be the median, a number near the middle of the data, or any value that seems reasonable.
3. **Calculate the Deviations (di)**
	* For each data point xi, subtract the assumed mean A:

di=xi−A

* + This step gives you a set of deviations, both positive and negative.
1. **Calculate the Sum of Deviations (∑di)**
	* Add up all the deviations you calculated in Step 3.
2. **Find the Arithmetic Mean Using the Formula**
	* Apply the formula:

Mean=A+∑di/n

* + Where:
		- A = Assumed mean
		- ∑di = Sum of deviations
		- n = Total number of observations

**Example 1:**

Data: **45, 50, 55, 60, 65, 70**

**Step 1: Choose an Assumed Mean (A)**
Let’s choose A=55 = 55 (since it's close to the middle of the data).

**Step 2: Calculate the Deviations (di=xi−A)**

45−55=−10

50−55=−5

55−55=0

60−55=5

65−55=10

70−55=15

**Step 3: Sum of Deviations**

**∑di=−10+(−5)+0+5+10+15=15**

**Step 4: Apply the Formula**

**Mean=55+15/6=55+2.5=57.5**

So, the **arithmetic mean** is **57.5**.

**Why Use the Short-Cut Method?**

* It’s faster, especially for large datasets.
* Reduces the chances of calculation errors by simplifying the math.
* Helpful when data is already close to a central value.

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