Step-1

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We have to find the average $\hat{x}_{10}$ of the numbers $b_1, b_2, ..., b_{10}$, also we have to find the coefficient of $\hat{x}_9$ such that $\hat{x}_{10} = \frac{1}{10} b_{10} + \_\_ \hat{x}_9 = \frac{1}{10}(b_1 + b_2 + ... + b_{10})$

Step-2

Let required value is *t*.

Now given equation is

$$\hat{x}_{10} = \frac{1}{10} b_{10} + t\hat{x}_9 = \frac{1}{10}(b_1 + b_2 + ... + b_{10})$$

$$\Rightarrow \frac{1}{10} b_{10} + t\,\hat{x}_9 = \frac{1}{10} b_{10} + \frac{1}{10}(b_1 + b_2 + ... + b_9)$$

$$\Rightarrow t\,\hat{x}_9 = \frac{1}{10}(b_1 + b_2 + ... + b_9)$$

Step-3

We know that for b_1, b_2,

$$\hat{x}_W = \frac{w_1^{\,2} b_1 + w_2^{\,2} b_2}{w_1^{\,2} + w_2^{\,2}}$$

Therefore

$$t\left(\frac{w_1^2 b_1 + w_2^2 b_2 + ... + w_9^2 b_9}{w_1^2 + w_2^2 + ... + w_9^2}\right) = \frac{1}{10}(b_1 + b_2 + ... + b_9)$$ â€¦â€¦ (1)

Step-4

For $w_1 = 1, w_2 = 1, ..., w_9 = 1$

Equation (1) is changed to

$$t\left(\frac{b_1 + b_2 + ... + b_9}{1 + 1 + ... + 1(9\text{ times})}\right) = \frac{1}{10}(b_1 + b_2 + ... + b_9)$$

$$\Rightarrow t\left(b_1+b_2+...+b_9\right)=\frac{9}{10}\left(b_1+b_2+...+b_9\right)$$

Hence $\boxed{t=\frac{9}{10}}$

Therefore $\hat{x}_{10}=\frac{1}{10}b_{10}+\frac{9}{10}\hat{x}_9=\frac{1}{10}\left(b_1+b_2+...+b_{10}\right)$