

1-1.2-20

EE24BTECH11066 - YERRA AKHILESH

Question:

The centroid of a triangle ABC is at the point $(1, 1, 1)$. If the coordinates of \mathbf{A} and \mathbf{B} are $(3, -5, 7)$ and $(-1, 7, -6)$, respectively find the coordinates of the point \mathbf{C} .

Solution:

point	Description
\mathbf{A}	$(3, -5, 7)$
\mathbf{B}	$(-1, 7, -6)$
\mathbf{C}	(x, y, z)
centroid of \mathbf{A} , \mathbf{B} and \mathbf{C} be \mathbf{G}	$(1, 1, 1)$

TABLE 0: Variables Used

$$\mathbf{G} = \frac{\mathbf{A} + \mathbf{B} + \mathbf{C}}{3} \quad (0.1)$$

(0.2)

$$\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \frac{\begin{pmatrix} 3 \\ -5 \\ 7 \end{pmatrix} + \begin{pmatrix} -1 \\ 7 \\ -6 \end{pmatrix} + \begin{pmatrix} x \\ y \\ z \end{pmatrix}}{3} \quad (0.3)$$

(0.4)

$$\begin{pmatrix} 3 \\ 3 \\ 3 \end{pmatrix} = \begin{pmatrix} 3 \\ -5 \\ 7 \end{pmatrix} + \begin{pmatrix} -1 \\ 7 \\ -6 \end{pmatrix} + \begin{pmatrix} x \\ y \\ z \end{pmatrix} \quad (0.5)$$

(0.6)

$$\begin{pmatrix} 3 \\ 3 \\ 3 \end{pmatrix} = \begin{pmatrix} 2 \\ 2 \\ 1 \end{pmatrix} + \begin{pmatrix} x \\ y \\ z \end{pmatrix} \quad (0.7)$$

(0.8)

$$\begin{pmatrix} 3 \\ 3 \\ 3 \end{pmatrix} - \begin{pmatrix} 2 \\ 2 \\ 1 \end{pmatrix} = \begin{pmatrix} x \\ y \\ z \end{pmatrix} \quad (0.9)$$

(0.10)

$$\begin{pmatrix} 1 \\ 1 \\ 2 \end{pmatrix} = \begin{pmatrix} x \\ y \\ z \end{pmatrix} \quad (0.11)$$

$$(0.12)$$

On comparing both sides,

$$x = 1, y = 1, z = 2 \quad (0.13)$$

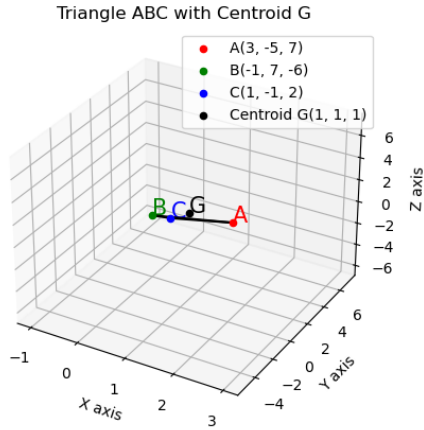


Fig. 0.1: Stem Plot of $y(n)$