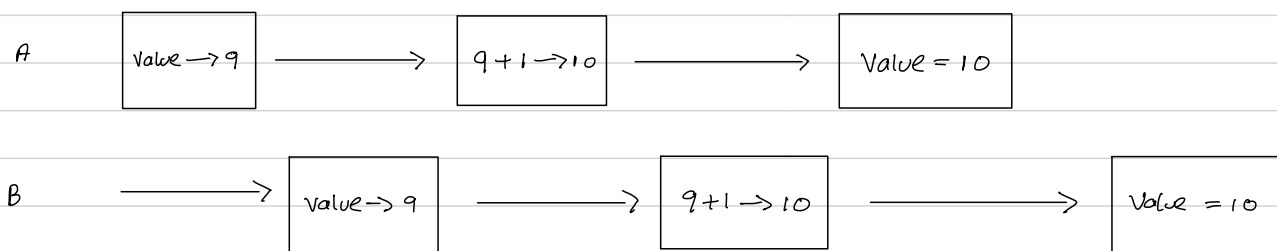



Unlucky Execution of UnsafeSequence.nextValue



1.

$$S_n = T_1 / T_n \quad \text{and} \quad T_n = T_3 + (CT_p / N)$$

$$(a) \quad S_4 = T_1 / T_4,$$

$$T_4 = (0.10 \times T_1 + (0.9/4) \times T_1)$$

$$\therefore E_n = S_n / n \Rightarrow E_4 = S_4 / 4$$

$$= 3.077 / 4$$

$$\approx 0.768$$

$$\begin{aligned} \text{Hence } S_4 &= \frac{T_1}{0.10T_1 + \frac{0.9}{4}T_1} \\ &= \frac{1}{0.10 + \frac{0.9}{4}} \end{aligned}$$

$$\approx 3.077$$

$$(b) \quad S_8 = T_1 / T_8,$$

$$T_8 = (0.10 \times T_1 + (0.9/8) \times T_1)$$

$$\therefore E_n = S_n / n \Rightarrow E_8 = S_8 / 8$$

$$=$$

$$\approx 0.768$$

$$\begin{aligned} \text{Hence } S_8 &= \frac{T_1}{0.10T_1 + \frac{0.9}{8}T_1} \\ &= \frac{1}{0.10 + \frac{0.9}{8}} \end{aligned}$$

$$\approx 4.706$$

$$(c) \quad S_{16} = T_1 / T_{16},$$

$$T_{16} = (0.10 \times T_1 + (0.9/16) \times T_1)$$

$$\therefore E_n = S_n / n \Rightarrow E_4 = S_4 / 4$$

$$= 3.077 / 4$$

$$\approx 0.768$$

$$\begin{aligned} \text{Hence } S_{16} &= \frac{T_1}{0.10T_1 + \frac{0.9}{16}T_1} \\ &= \frac{1}{0.10 + \frac{0.9}{16}} \end{aligned}$$

$$\approx 6.4$$

2.

$$\begin{aligned} \text{ca)} \quad S_8 &= T_1 / T_4, \\ &= T_1 / (C(1-0.2)T_1 + \left[\frac{0.2}{8}\right]T_1) \\ &= 1 / (0.8) + \frac{0.2}{8} \\ &\approx 1.212 \end{aligned}$$

$$\begin{aligned} \text{cb)} \quad S_4 &= T_1 / T_4 \\ &= T_1 / (T_1(1-0.5) + (0.5/4)T_1) \\ &= 1 / 0.5 + (0.5/4) \\ &\approx 1.6 \end{aligned}$$

3.

$$\text{Hence } \lim_{n \rightarrow \infty} S_n = \lim_{n \rightarrow \infty} \frac{1}{[0.9 + \frac{0.1}{n}]} \Rightarrow \frac{1}{0.9 + 0} \Rightarrow \frac{1}{0.9}$$

$$\therefore \lim_{n \rightarrow \infty} S_n \approx 1.11$$

Exercise 1

$$1. \quad T_s = 30\% \\ T_p = 100\% - 30\% = 70\%$$

$$T_n = T_s + (T_p / n) \\ = T_1 \cdot 0.3 + \left[\frac{0.7}{2} \right] \cdot T_1$$

$$S_n = \frac{T_1}{T_n}$$

$$= \frac{T_1}{0.3T_1 + \frac{0.7}{2} \cdot T_1}$$

$$= \frac{1}{0.3 + \frac{0.7}{2}}$$

$$= \frac{1}{0.3 + 0.35}$$

$$= \frac{1}{0.65}$$

$$\approx 1.54$$

$$2. \quad S_{16} = \frac{T_2}{T_{16}} \\ = \frac{0.3T_1 + \frac{0.7}{2} \cdot T_1}{0.3T_1 + \frac{0.7}{16} \cdot T_1} \\ = \frac{0.3 + \frac{0.7}{2}}{0.3 + \frac{0.7}{16}} \\ = 1.91$$