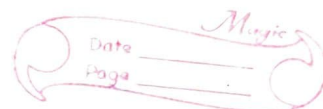


2019CSB1071



written Assignment - IV

Ans-1

$$\Rightarrow b > 5$$

$$\Rightarrow 2*a - 1 > 5$$

$$\Rightarrow a > 3$$

Given that, $a = 3*(2*b + a)$

$$\Rightarrow a > 3$$

$$\Rightarrow 3*(2*b + a) > 3$$

$$\Rightarrow 2*b + a > 1$$

$$\Rightarrow b > \frac{1-a}{2}$$

weakest pre condition is $b > \frac{1-a}{2}$

Ans-2

~~Q~~ P: $\{n > 0 \ \& \ count = n \ \& \ sum = 0\}$

Q: $\{sum = 1 + 2 + \dots + n\}$

i) for 0th iteration : $\{sum = 0\}$
 $\{count = n\}$

ii) for 1st iteration : $\{sum = 0 + n = n\}$
 $\{count = n - 1\}$

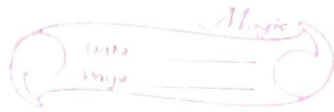
iii) for 2nd iteration : $\{sum = n + n - 1\}$
 $\{count = n - 2\}$

iv) for 3rd iteration : $\{sum = n + n - 1 + n - 2\}$
 $\{count = n - 3\}$

v) for 4th iteration : $\{sum = n + n - 1 + n - 2 + n - 3\}$
 $\{count = n - 4\}$

The relationship between sum & count can be written as

$sum = n + (n-1) + \dots + (count + 2) + (count + 1)$
 after each iteration



when $\text{count} = n$,

$$\Rightarrow \sum_{x=1}^n x - \sum_{x=1}^n x$$

$$\Rightarrow 0$$

Hence $P \Rightarrow I$

$$\textcircled{*} B = \text{count} \neq 0$$

$$\Rightarrow \{I \neq B\} = \{\text{sum} = n + (n-1) + \dots + (\text{count}+1) + (\text{count}+2) \neq \text{count} \neq 0\}$$

$$I: \{\text{sum} = n + (n-1) + \dots + (\text{count}+1) + \text{count} + 2\}$$

Hence, we observe that

$$\{I \neq B\} \subseteq \{I\}$$

Also

$$\{I \neq !B\} = \{ \text{sum} = n + (n-1) + \dots + (\text{count}+1) + (\text{count}+2) \}$$

$$\neq (\text{count} = 0)$$

$$\Rightarrow \{ \text{sum} = n + (n-1) + \dots + 2 + 1 \} = \emptyset$$

Hence, we proved that

$$\{I \neq !B\} \Rightarrow \emptyset$$

In each iteration of while loop count decreases by 1, $\neq n > 0 \neq \text{count} > 0$ before start of loop. So, loop will always terminate \neq become equal to 0 in n steps.

Hence, at the end of loop

$$\text{sum} = n + (n-1) + \dots + (\text{count}+1) + (\text{count}+2)$$

$\neq \text{count} = 0$, so

$$\text{sum} = n + (n-1) + \dots + 2 + 1$$