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تقریب ۲ مباحث برنامه نویسی استاد هاشمی

① $\text{int } a = 20;$
 $\text{int } b = --a * 2 + a + 1/3; \rightarrow a = 20 - 1 = 19 \rightarrow a = 19 + 1 = 20$
 $a \% 3 \rightarrow a = a \% 3 \quad \frac{20}{3} \Rightarrow \boxed{a = 2}$

$b = (19 \times 2) + (19/3) = 38 + 6 = 44 \Rightarrow \boxed{b = 44}$

② $\text{int } p = 6, q = 4$
 $p = p \wedge q$
 $\text{int } r = p \wedge q$
 $q = q \& r$

$p = 6_D = 110_B$
 $q = 4_D = 100_B$
OR $\frac{110}{100} \Rightarrow \boxed{p = 6}$

XOR $\frac{110}{100} \Rightarrow \boxed{r = 2}$

AND $\frac{100}{010} \Rightarrow \boxed{q = 0}$

③ $z = \text{int}(12/3.5) = 3 \Rightarrow x = \text{int}(12/3 + 3 \times 3.5) = 4 + 10 = 14 \Rightarrow \boxed{x = 14}$
 $z = \text{int}(y)/x = 3/14 \Rightarrow \boxed{z = 0}$
 $p = \text{int}(x/y) = \text{int}(14/3) = 4 \Rightarrow \boxed{p = 4}$
 $y = 3.5$

④ $a = 3_D = 11.00_B$ $\text{int } b = a \ll 1$ \rightarrow a را یک بیت به سمت چپ شیفت کرد
 $\rightarrow 110.0 \Rightarrow 4 + \frac{1}{2} = 4.5 \Rightarrow \boxed{b = 6}$
 $!b = !6 = 0 \Rightarrow c = 0 + 3 = 3 \Rightarrow \boxed{c = 3}$
 $a = 3$

$c = 3_D = 11.00_B$ \rightarrow $1100.00_B = 4 + 8 = 12_D$ $!! = 0$
OR $\frac{1100.00}{0000.00} \Rightarrow \boxed{d = 12}$

(A) $\text{int } a = 5 \mid ((12 \& 3) + (8 * 2) - 7)$

$12_D \equiv 1100_B$

$3_D \equiv 0011_B$

And $\frac{1100}{0011} = 0000_B \equiv 0_D$

$\Rightarrow a = 5 \mid 9$

OR $\frac{0101}{1001} = 1101$

$1101_B \equiv 13_D \Rightarrow \boxed{a = 13}$

(B) $\text{int } b = 10 \mid (5 + (3 * 2) - 8) \ll 1$

$5 + 6 - 8 = 3$

یک شیفت به چپ

$3_D \equiv 1100_B \rightarrow 11000$

$3 \ll 1$

$10_D \equiv 1010_B$

XOR $\frac{1010}{0110} = 1100$

$\rightarrow \boxed{b = 12}$

(C) $\text{int } c = (12 \gg 3) \& (5 + 7) \mid (3 * 2) - 1 \mid 8$

$12_D \equiv 1100_B \xrightarrow{\text{سه شیفت به راست}} 001.100_B \equiv 15_D$

$c = (((001.100_B) \& (12)) \mid 5) \mid 8$

AND $\frac{0001.100}{1100.000} = 0000.000$

XOR $\frac{0000}{0001} = 0101$

OR $\frac{0101}{1000} = 1101$

$\rightarrow 1101_B \equiv 13_D \Rightarrow \boxed{c = 13}$

(A) $\text{int } a = 10, b = 20, c = 17;$

$\text{int result} = (a > b) ? ((a > c) ? a : c) : ((b > c) ? b : c);$

$20 > 10$ نادرست

درست

$\boxed{\text{result} = b = 20}$

(B) $\text{int } a = 17, b = 3, s = -6;$

$\text{int result} = s ? ((a > b) ? a - b : b - a) : 0;$

درست مقدار غیر صفر ← درست

$\boxed{\text{result} = a - b = 14}$

① start

② $a=0, b=0, \text{counter}=1, \text{max-counter}=1$

③ get a, b from user

④ if $a==0$ or $b==0$ then

$\text{max-counter}=0$

$\text{print}(\text{max-counter})$

else if $a==b$ then

$\text{max-counter}=a$

$\text{print}(\text{max-counter})$

else

if $b > a$ then

while $\text{counter} \leq a$

if $a \% \text{counter} == 0$ then

if $b \% \text{counter} == 0$ then

if $\text{counter} \geq \text{max-counter}$ then

$\text{max-counter} = \text{counter}$

Endif

Endif

Endif

$\text{counter} = \text{counter} + 1$

Endwhile

$\text{print}(\text{max-counter})$

else if $a > b$ then

while $\text{counter} \leq b$

if $b \% \text{counter} == 0$ then

if $a \% \text{counter} == 0$ then

if $\text{counter} \geq \text{max-counter}$ then

$\text{max-counter} = \text{counter}$

Endif

Endif

Endif

$\text{counter} = \text{counter} + 1$

Endwhile

$\text{print}(\text{max-counter})$

⑤ end

④ فرض می‌کنیم a, b
هر دو نامقدّم هستند.

① start

② $\text{count}_i = 1$, $\text{count}_j = 1$, $i = 0$, $j = 0$, $\text{Brokens} = 0$, $\text{Brokens_percent} = 0$

③ get i, j from user

④ while $\text{count}_i \leq i$

while $\text{count}_j \leq j$

input = 1

get input from user

if $\text{input} == 0$ then

$\text{Brokens} = \text{Brokens} + 1$

Endif

$\text{count}_j = \text{count}_j + 1$

Endwhile

$\text{count}_i = \text{count}_i + 1$

Endwhile

⑤ $\text{Brokens_percent} = (\text{Brokens} / (i \times j)) \times 100$

⑥ print(Brokens), print(Brokens_percent)

⑦ end

① start

② $n = 0$, $a = 0$, $\text{digits} = 1$, $\text{check} = 0$

③ get n from user (ن عدد اصلی وارد شده است)

④ $a = n$

⑤ while $a // 10 \neq 0$

$\text{digits} = \text{digits} + 1$

$a = a // 10$

Endwhile

⑥ $\therefore a = n$

⑦ while $a // 10 \neq 0$

$b = a \% 10$

$\text{check} = \text{check} + b^{\text{digits}}$

$a = a // 10$

Endwhile

⑧ $\text{check} = \text{check} + a^{\text{digits}}$

⑨ فرض می‌کنیم حالت // به معنای خارج قسمت تقسیم و حالت % به معنای باقی مانده تقسیم است.

⑨ if $\text{check} == n$ then
print("The number
you entered is Armstrong")

else

print("The number
you entered is not
Armstrong")

⑩ end

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