



## Answers to Quiz on Sequences

See *Iron Analyst* 54 for the questions.

In the answers to 1 through 7, we've put some of complicated expressions on separate lines to improve readability. Note that they all are mutual evaluation expressions.

1.  $(i := \text{seq}(), \text{if } i == \text{reverse}(i) \text{ then } i)$

2.  $($   
 $k := \&\text{null}, m := 0, i := \text{seq}(),$   
 $\text{if } /k \text{ then } k := i \text{ else } 1,$   
 $\text{if } k \sim i \text{ then}$   
 $($   
 $m += 1,$   
 $\text{if } m \% 2 = 1 \text{ then } i \text{ else } 1(k, k := i)$   
 $)$   
 $)$

3.  $(i := \text{seq}(), 1 \text{ to } i)$

4.  $(i := \text{seq}(), (1 \text{ to } i) \mid (i - 1 \text{ to } 1 \text{ by } -1))$

5.  $(i := \text{seq}(), j := 0, (\text{every } j += !i) \mid j)$

6.  $($   
 $i := \text{seq}(),$   
 $\text{repeat } \{$   
 $j := 0$   
 $\text{every } j += !i$   
 $\text{if } *j = 1 \text{ then break } j$   
 $i := j$   
 $\}$   
 $)$

7.

(a) 1, 1, 2, 1, 2, 3, 1, 2, 3, 4, 1, 2, 3, 4, 5, 1, 2, 3, 4, 5, 6, 1, 2, 3, 4, 5, 6, 7, 1, 2, 3, 4, 5, 6 ...

(b) 1, 1, 4, 1, 4, 9, 1, 4, 9, 16, 1, 4, 9, 16, 25, 1, 4, 9, 16, 25, 36, 1, 4, 9, 16, 25, 36, 49, 1, 4, ...

(c) 1, 1, 2, 3, 4, 1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, ...

(d) 1, 1, 4, 9, 16, 1, 4, 9, 16, 25, 36, 49, 64, 81, 1, 4, 9,

16, 25, 36, 49, 64, 81, 100, 121, 144, 169, ...

(e) 1, 1, 1, 1, 1, 2, 1, 1, 2, 1, 1, 1, 2, 1, 2, 1, 1, 2, 1, 2, 3, 1, 1, 2, 1, 2, 3, ...

(f) 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 1, 1, 1, 1, 1, 2, ...

1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, ...

(g) 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, ...

(h) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 2...

(i) -1, 1, -1, 1, -1, 1, -1, 1, -1, 1, -1, 1, -1, 1, ...

(j) 5, 10, 15, 20, 25, 30, 35, 40, 0, 5, 10, 15, 20, 25, 30, 35, 40, 0, 5, 10, 15, 20, 25, 30, 35, 40, ...

8.

(a)  $!\text{seq}()$

(b)  $!\text{seq}() \% 7$

(c)  $\text{seq}() \setminus \text{seq}(1, 2)$

(d)  $(i := \text{seq}(), i \wedge i)$

(e) We accidentally deleted a digit in the fifth term for the sequence given. The sequence should have been

3, 81, 19683, 43046721, 847288609443,  
 150094635296999121, ...

for which a solution is  $3 \wedge (\text{seq}() \wedge 2)$ .