Answers to Quiz on Sequences

See Icon Analyst 54 for the questions.

In the answers to 1 though 7, we’ve put some 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. \( (k := \&\text{null}, m := 0, i := \text{seq}(), \text{if } k \text{ then } k := i \text{ else } 1, \text{if } k ~=} i \text{ then} \)
   \( (m += 1, \text{if } m \% 2 = 1 \text{ then } i \text{ else } 1(.k, k := i)) \)

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. \( (a) \ 1, 1, 2, 1, 2, 3, 1, 2, 3, 1, 2, 3, 4, 5, 1, 2, 3, 4, 5, 6, 1, 2, 3, 4, 5, 6, 7, 1, 2, 3, 4, 5, 6 \ldots \)
   \( (b) \ 1, 1, 4, 1, 4, 9, 1, 4, 9, 16, 1, 4, 9, 16, 25, 1, 4, 9, 16, 25, 36, 1, 4, 9, 16, 25, 36, 49, 1, 4, \ldots \)
   \( (c) \ 1, 1, 2, 3, 4, 1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, \ldots \)
   \( (d) \ 1, 1, 4, 9, 16, 1, 4, 9, 16, 25, 36, 49, 64, 81, 1, 4, 9, 16, 25, 36, 49, 64, 81, 1, 4, 9, \ldots \)
   \( (e) \ 1, 1, 1, 1, 2, 1, 1, 2, 1, 1, 2, 1, 1, 2, 1, 2, 1, 2, 1, 2, 3, 1, 1, 2, 1, 2, 1, 2, 3, \ldots \)
   \( (f) \ 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 1, 1, 1, 1, 1, 2, 1, 1, 1, 1, 1, 2, \ldots \)
   \( 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, \ldots \)
   \( (g) \ 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, \ldots \)
   \( (h) \ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 \ldots \)
   \( (i) \ -1, 1, -1, 1, -1, 1, -1, 1, -1, 1, -1, 1, -1, 1, \ldots \)
   \( (j) \ 5, 10, 15, 20, 25, 30, 35, 40, 0, 5, 10, 15, 20, 25, 30, 35, 40, 0, 5, 10, 15, 20, 25, 30, 35, 40, \ldots \)

8. \( (a) \ !\text{seq}() \)
   \( (b) \ !\text{seq}() \% 7 \)
   \( (c) \ \text{seq}() \ \text{\textbackslash} \ \text{seq}(1,2) \)
   \( (d) \ (i := \text{seq}(), i ^ i) \)
   \( (e) \ \text{We accidentally deleted a digit in the fifth term for the sequence given. The sequence should have been} \)
   \( 3, 81, 19683, 43046721, 847288609443, 150094635296999121, \ldots \)
   \( \text{for which a solution is } 3 ^ \text{(seq() ^ 2)}. \)