



Triples for the new year



décembre 31, 2023



(Dall-e creation)

The hereunder sequence s is both a succession of triples of monotonically increasing numbers and a succession of

triples of monotonically increasing digits.

s is the lexicographically earliest such sequence with distinct number-triples:

S =

0,1,2,0,1,3,0,1,4,0,1,5,0,1,6,0,1,7,0,1,8,0,1,9,0,2,3,0,2,4,0,2,5,0,2,6,0,2,7,0,2,8,0,2,9,
 0,3,4,0,3,5,0,3,6,0,3,7,0,3,8,0,3,9,0,4,5,0,4,6,0,4,7,0,4,8,0,4,9,0,5,6,0,5,7,0,5,8,0,5,9,
 0,6,7,0,6,8,0,6,9,0,7,8,0,7,9,0,8,9,1,2,3,1,2,4,1,2,5,1,2,6,1,2,7,1,2,8,1,2,9,1,3,4,1,3,5,
 1,3,6,1,3,7,1,3,8,1,3,9,1,4,5,1,4,6,1,4,7,1,4,8,1,4,9,1,5,6,1,5,7,1,5,8,1,5,9,1,6,7,1,6,8,
 1,6,9,1,7,8,1,7,9,1,8,9,2,3,4,2,3,5,2,3,6,2,3,7,2,3,8,2,3,9,2,4,5,2,4,6,2,4,7,2,4,8,2,4,9,
 2,5,6,2,5,7,2,5,8,2,5,9,2,6,7,2,6,8,2,6,9,2,7,8,2,7,9,2,8,9,3,4,5,3,4,6,3,4,7,3,4,8,3,4,9,
 3,5,6,3,5,7,3,5,8,3,5,9,3,6,7,3,6,8,3,6,9,3,7,8,3,7,9,3,8,9,4,5,6,4,5,7,4,5,8,4,5,9,4,6,7,
 4,6,8,4,6,9,4,7,8,4,7,9,4,8,9,5,6,7,5,6,8,5,6,9,5,7,8,5,7,9,5,8,9,6,7,8,6,7,9,6,8,9,7,8,9,
 0,1,20,1,2,12,3,12,30,1,2,13,4,12,30,1,2,14,5,12,30,1,2,15,6,12,30,1,2,16,7,12,30,1,2,17,8
 ,12,30,1,2,18,9,12,30,1,2,23,4,12,31,2,3,12,3,12,31,2,3,13,4,12,31,2,3,14,5,12,31,2,3,15,6
 ,12,31,2,3,16,7,12,31,2,3,17,8,12,31,2,3,18,9,12,31,2,3,23,4,12,32,3,4,12,3,12,32,3,4,13,4
 ,12,32,3,4,14,5,12,32,3,4,15,6,12,32,3,4,16,7,12,32,3,4,17,8,12,32,3,4,18,9,12,32,3,4,23,4
 ,12,33,...

Here is how S was constructed.

First (alternating yellow and white colors for readability), we have the 120 triples which are both numbers and digits in monotonically increasing order:

S =

0,1,2,0,1,3,0,1,4,0,1,5,0,1,6,0,1,7,0,1,8,0,1,9,
 0,2,3,0,2,4,0,2,5,0,2,6,0,2,7,0,2,8,0,2,9,
 0,3,4,0,3,5,0,3,6,0,3,7,0,3,8,0,3,9,
 0,4,5,0,4,6,0,4,7,0,4,8,0,4,9,
 0,5,6,0,5,7,0,5,8,0,5,9,
 0,6,7,0,6,8,0,6,9,

0, 7, 8, 0, 7, 9,

0, 8, 9,

|

1, 2, 3, 1, 2, 4, 1, 2, 5, 1, 2, 6, 1, 2, 7, 1, 2, 8, 1, 2, 9,

1, 3, 4, 1, 3, 5, 1, 3, 6, 1, 3, 7, 1, 3, 8, 1, 3, 9,

1, 4, 5, 1, 4, 6, 1, 4, 7, 1, 4, 8, 1, 4, 9,

1, 5, 6, 1, 5, 7, 1, 5, 8, 1, 5, 9,

1, 6, 7, 1, 6, 8, 1, 6, 9,

1, 7, 8, 1, 7, 9,

1, 8, 9,

|

2, 3, 4, 2, 3, 5, 2, 3, 6, 2, 3, 7, 2, 3, 8, 2, 3, 9,

2, 4, 5, 2, 4, 6, 2, 4, 7, 2, 4, 8, 2, 4, 9,

2, 5, 6, 2, 5, 7, 2, 5, 8, 2, 5, 9,

2, 6, 7, 2, 6, 8, 2, 6, 9,

2, 7, 8, 2, 7, 9,

2, 8, 9,

3, 4, 5, 3, 4, 6, 3, 4, 7, 3, 4, 8, 3, 4, 9,

3, 5, 6, 3, 5, 7, 3, 5, 8, 3, 5, 9,

3, 6, 7, 3, 6, 8, 3, 6, 9,

3, 7, 8, 3, 7, 9,

3, 8, 9,

|

4, 5, 6, 4, 5, 7, 4, 5, 8, 4, 5, 9,

4, 6, 7, 4, 6, 8, 4, 6, 9,

4, 7, 8, 4, 7, 9,

4, 8, 9,

|
5, 6, 7, 5, 6, 8, 5, 6, 9,

5, 7, 8, 5, 7, 9,

5, 8, 9,

|
6, 7, 8, 6, 7, 9,

6, 8, 9,

7, 8, 9,

Next are the number-triples having 3 numbers in monotonically increasing order and using altogether more than 3 digits (grey and white colors):

|
0, 1, 20,

1, 2, 12, 3, 12, 30, 1, 2, 13, 4, 12, 30, 1, 2, 14, 5, 12, 30, 1, 2, 15, 6, 12, 30, 1, 2, 16, 7, 12, 30, 1, 2, 17, 8, 12, 30,
1, 2, 18, 9, 12, 30, 1, 2, 23, 4, 12, 31,

2, 3, 12, 3, 12, 31, 2, 3, 13, 4, 12, 31, 2, 3, 14, 5, 12, 31, 2, 3, 15, 6, 12, 31, 2, 3, 16, 7, 12, 31, 2, 3, 17, 8, 12, 31,
2, 3, 18, 9, 12, 31, 2, 3, 23, 4, 12, 32,

3, 4, 12, 3, 12, 32, 3, 4, 13, 4, 12, 32, 3, 4, 14, 5, 12, 32, 3, 4, 15, 6, 12, 32, 3, 4, 16, 7, 12, 32, 3, 4, 17, 8, 12, 32,
3, 4, 18, 9, 12, 32, 3, 4, 23, 4, 12, 33, . . .

The above grey/white succession of number-triples is also a succession of digit-triples (digits in monotonically increasing order, aqua/white color):

0, 1, 20,

1, 2, 12, 3, 12, 30, 1, 2, 13, 4, 12, 30, 1, 2, 14, 5, 12, 30, 1, 2, 16, 7,
, 12, 30, 1, 2, 17, 8, 12, 30, 1, 2, 18, 9, 12, 30, 1, 2, 23, 4, 12, 31,

2, 3, 12, 3, 12, 31, 2, 3, 13, 4, 12, 31, 2, 3, 14, 5, 12, 31, 2, 3, 15, 6, 12, 31, 2, 3, 16, 7, 12, 31, 2, 3, 17, 8, 12, 31, 2, 3, 18, 9, 12, 31, 2, 3, 23, 4, 12, 32,

3, 4, 12, 3, 12, 32, 3, 4, 13, 4, 12, 32, 3, 4, 14, 5, 12, 32, 3, 4, 15, 6, 12, 32, 3, 4, 16, 7, 12, 32, 3, 4, 17, 8, 12, 32, 3, 4, 18, 9, 12, 32, 3, 4, 23, 4, 12, 33, . . .

The successive yellow/white triples and grey/white triples form s:

s =

0, 1, 2, 0, 1, 3, 0, 1, 4, 0, 1, 5, 0, 1, 6, 0, 1, 7, 0, 1, 8, 0, 1, 9, 0, 2, 3, 0, 2, 4, 0, 2, 5, 0, 2, 6, 0, 2, 7, 0, 2, 8, 0, 2, 9, 0, 3, 4, 0, 3, 5, 0, 3, 6, 0, 3, 7, 0, 3, 8, 0, 3, 9, 0, 4, 5, 0, 4, 6, 0, 4, 7, 0, 4, 8, 0, 4, 9, 0, 5, 6, 0, 5, 7, 0, 5, 8, 0, 5, 9, 0, 6, 7, 0, 6, 8, 0, 6, 9, 0, 7, 8, 0, 7, 9, 0, 8, 9, 1, 2, 3, 1, 2, 4, 1, 2, 5, 1, 2, 6, 1, 2, 7, 1, 2, 8, 1, 2, 9, 1, 3, 4, 1, 3, 5, 1, 3, 6, 1, 3, 7, 1, 3, 8, 1, 3, 9, 1, 4, 5, 1, 4, 6, 1, 4, 7, 1, 4, 8, 1, 4, 9, 1, 5, 6, 1, 5, 7, 1, 5, 8, 1, 5, 9, 1, 6, 7, 1, 6, 8, 1, 6, 9, 1, 7, 8, 1, 7, 9, 1, 8, 9, 2, 3, 4, 2, 3, 5, 2, 3, 6, 2, 3, 7, 2, 3, 8, 2, 3, 9, 2, 4, 5, 2, 4, 6, 2, 4, 7, 2, 4, 8, 2, 4, 9, 2, 5, 6, 2, 5, 7, 2, 5, 8, 2, 5, 9, 2, 6, 7, 2, 6, 8, 2, 6, 9, 2, 7, 8, 2, 7, 9, 2, 8, 9, 3, 4, 5, 3, 4, 6, 3, 4, 7, 3, 4, 8, 3, 4, 9, 3, 5, 6, 3, 5, 7, 3, 5, 8, 3, 5, 9, 3, 6, 7, 3, 6, 8, 3, 6, 9, 3, 7, 8, 3, 7, 9, 3, 8, 9, 4, 5, 6, 4, 5, 7, 4, 5, 8, 4, 5, 9, 4, 6, 7, 4, 6, 8, 4, 6, 9, 4, 7, 8, 4, 7, 9, 4, 8, 9, 5, 6, 7, 5, 6, 8, 5, 6, 9, 5, 7, 8, 5, 7, 9, 5, 8, 9, 6, 7, 8, 6, 7, 9, 6, 8, 9, 7, 8, 9, 0, 1, 20, 1, 2, 12, 3, 12, 30, 1, 2, 13, 4, 12, 30, 1, 2, 14, 5, 12, 30, 1, 2, 15, 6, 12, 30, 1, 2, 16, 7, 12, 30, 1, 2, 17, 8, 12, 30, 1, 2, 18, 9, 12, 30, 1, 2, 23, 4, 12, 31, 2, 3, 12, 3, 12, 31, 2, 3, 13, 4, 12, 31, 2, 3, 14, 5, 12, 31, 2, 3, 15, 6, 12, 31, 2, 3, 16, 7, 12, 31, 2, 3, 17, 8, 12, 31, 2, 3, 18, 9, 12, 31, 2, 3, 23, 4, 12, 32, 3, 4, 12, 3, 12, 32, 3, 4, 13, 4, 12, 32, 3, 4, 14, 5, 12, 32, 3, 4, 15, 6, 12, 32, 3, 4, 16, 7, 12, 32, 3, 4, 17, 8, 12, 32, 3, 4, 18, 9, 12, 32, 3, 4, 23, 4, 12, 33, . . .

Question

When will 2024 appear in s?

Happy New Year to all – and thanks again to the 2023 contributors!

(this seq will [enter the OEIS](#) soon, I hope)



(Dall-e creation)