19   The North Pole Museum

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Challenge

Excitement is in the air at the North Pole Museum of Christmas Technology. For the very first time, the museum is opening its doors to the public — and since a huge crowd is expected, it will remain open around the clock for the first three days!

To showcase the ingenious sleigh innovations developed over the centuries, Santa established the first major exhibition space, Hall A: Here shine the greatest triumphs — from the classic wooden sleigh powered by reindeer to the short-lived jet-powered model, and the legendary — but unfortunately completely uncontrollable — AI prototype. Next door, in Hall B, the Candy Cane Engineering Hall, visitors discover how candy canes are manufactured, shaped, and designed for delicious delight.

The museum has three doors: one connecting the outside world to Hall A, one connecting the outside world to Hall B, and one connecting Hall A to Hall B. Visitors arrive at the popular museum at a rate of exactly 1 visitor per minute starting at the opening hour of the museum and continuing throughout the three days. All visitors want to visit both halls, but may take one of two different routes through the museum. Route 1 first visits Hall A, then Hall B, and then leaves, and route 2 first visits Hall B, then Hall A, and then leaves.

Arriving visitors alternate between these two routes: The first visitor starts with Hall A, then after 1 minute the next visitor starts with Hall B, then after 1 minute the next visitor starts with Hall A, and so on. Each visitor stays at Hall A for exactly 15 minutes, and at Hall B for exactly 45 minutes (because of all the delicious candy cane samples).

Elf Alma is the 2025th visitor. Let k be the number of other visitors she sees during her visit to the museum. Here, a visitor is seen if at any time they are in the same hall with her, or meet while transitioning from one hall to the other. What is the units digit of k?

Possible Answers:

1. 1

2. 2

3. 3

4. 4

5. 5

6. 6

7. 7

8. 8

9. 9

10. 0