Project Euler #109: Darts

This problem is a programming version of [Problem 109](https://projecteuler.net/problem=109) from projecteuler.net

In the game of darts a player throws three darts at a target board which is split into twenty equal sized sections numbered one to twenty.

The score of a dart is determined by the number of the region that the dart lands in. A dart landing outside the red/green outer ring scores zero. The black and cream regions inside this ring represent single scores. However, the red/green outer ring and middle ring score double and treble scores respectively.

At the centre of the board are two concentric circles called the bull region, or bulls-eye. The outer bull is worth 25 points and the inner bull is a double, worth 50 points.

There are many variations of rules but in the most popular game the players will begin with a score 301 or 501 and the first player to reduce their running total to zero is a winner. However, it is normal to play a "doubles out" system, which means that the player must land a double (including the double bulls-eye at the centre of the board) on their final dart to win; any other dart that would reduce their running total to one or lower means the score for that set of three darts is "bust".

When a player is able to finish on their current score it is called a "checkout" and the highest checkout is 170: T20 T20 D25 (two treble 20s and double bull).

There are exactly 14 distinct ways to checkout on a score of 6:

$$\begin{align*} &D3 & ~ && ~ &\\ &D1 & D2 && ~ &\\ &S2 & D2 && ~ &\\ &D2 & D1 && ~ &\\ &S4 & D1 && ~ &\\ &S1 & S1 && D2& \\ &S1 & T1 && D1& \\ &T1 & S1 && D1& \\ &S1 & S3 && D1& \\ &S3 & S1 && D1& \\ &D1 & D1 && D1& \\ &D1 & S2 && D1& \\ &S2 & D1 && D1& \\ &S2 & S2 && D1& \end{align*}$$

Note that D1 D2 is considered **different** to D2 D1 as they finish on different doubles. Moreover, the combination S1 T1 D1 is also considered **different** to T1 S1 D1.

In addition we shall not include misses in considering combinations; for example, D3 is the **same** as 0 D3 and 0 0 D3.

Now imagine you have an infinite number of darts. Now you can stop on every double you get. How many ways you have to checkout with score $\leq N$?

Input Format

A single natural number $N \leq 2^{60}$ - maximum score you need to investigate.

Output Format

The only number $-$ the answer to the problem modulo 10^9+9.

Sample Input

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4
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Sample Output

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6
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Explanation

There are six ways:
1) D1: score=2
2) S1 D1: score=3
3) D2: score=4
4) D1 D1: score=4
5) S2 D1: score=4
6) S1 S1 D1: score=4