2019 AIME I #1

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Consider the integer

$$N = 9 + 99 + 999 + 9999 + \cdots + \underbrace{99\ldots99}_{321 \text{ digits}}.$$

Find the sum of the digits of N.

The sum is

$$\sum_{n=1}^{321} 10^n - 1 = \underbrace{111\ldots11}_{321\ 1\text{s}}0 - 321 = \underbrace{111\ldots11}_{318\ 1\text{s}}0789$$

so the sum of the digits of N is $318 + 7 + 8 + 9 = \boxed{342}$ as desired. ■