**Problem Overview:**

We are given an array A containing 100 integers, each generated using r.nextInt(10). The numbers are uniformly random from the set {0, 1, 2, ..., 9}, and we are asked to determine the **probable product x** of all these integers in A and a **formula for the probability** that x will equal this number with a probability at least **0.99**.

**Step 1: Understanding the Random Values**

Each number in the array is a random integer from 0 to 9, inclusive, generated by r.nextInt(10). Hence, each integer is uniformly selected from this range.

The product x of all integers in the array A is:

x=A[0]×A[1]×A[2]×⋯×A[99]x = A[0] \times A[1] \times A[2] \times \cdots \times A[99]x=A[0]×A[1]×A[2]×⋯×A[99]

Since one of the integers could be 0, this will affect the value of the product. Specifically:

* If **any element in A is 0**, then **the product x will be 0**.
* If **none of the elements are 0**, then x will be the product of the non-zero elements in A.

**Step 2: Probability of the Product Being Zero**

For x to be **0**, at least one element in the array must be 0. The probability that any given element is **not 0** is:

P(element≠0)=910P(\text{element} \neq 0) = \frac{9}{10}P(element=0)=109​

Therefore, the probability that all 100 elements are **non-zero** (i.e., none of the elements are 0) is:

P(none are 0)=(910)100P(\text{none are 0}) = \left( \frac{9}{10} \right)^{100}P(none are 0)=(109​)100

The probability that at least one element is 0 (and thus the product x is 0) is:

P(product is 0)=1−(910)100P(\text{product is 0}) = 1 - \left( \frac{9}{10} \right)^{100}P(product is 0)=1−(109​)100

**Step 3: Estimating the Value of x**

For a product x to **not be zero**, all elements must be non-zero. The values in A can only be integers from 1 to 9 (since we excluded 0). Hence, if all elements are non-zero, the product is the product of values between 1 and 9.

However, since we are interested in a scenario where x equals a specific number **with at least 0.99 probability**, we focus on the case where **the product is zero**.

**Step 4: Formula for the Probability**

The probability that the product x is zero is:

P(product is 0)=1−(910)100P(\text{product is 0}) = 1 - \left( \frac{9}{10} \right)^{100}P(product is 0)=1−(109​)100

Given that (910)100\left( \frac{9}{10} \right)^{100}(109​)100 is very small (approximately 2.65614e-05), the probability that the product is **zero** is very close to 1:

P(product is 0)≈1−2.65614e−05=0.999974P(\text{product is 0}) \approx 1 - 2.65614e-05 = 0.999974P(product is 0)≈1−2.65614e−05=0.999974

**Step 5: Conclusion**

The product x will equal **0** with probability at least **0.99**, and this probability is very close to 1. Therefore, the number that x will equal with probability at least 0.99 is:

0\boxed{0}0​

And the formula for the probability that x equals this number is:

P(product is 0)=1−(910)100P(\text{product is 0}) = 1 - \left( \frac{9}{10} \right)^{100}P(product is 0)=1−(109​)100