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TO PASS 75% or higher

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Hash Tables and Hash Functions

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1. What is the size of the array needed to store integer keys with up to 12 digits using direct addressing? **1 / 1 point**

- 12
- 10^{12}
- 2^{12}

Correct
This is the number of all integers with up to 12 digits.

2. What is the maximum possible chain length for a hash function $h(x) = x \bmod 1000$ used with a hash table of size 1000 for a universe of all integers with at most 12 digits? **1 / 1 point**

- 10^{12}
- 1
- 10^{9}

Correct
When the values of the last 3 digits are fixed, there are 10^9 numbers with at most 12 digits.

3. You want to hash integers from 0 up to 1000000. What can be a good choice of p for the universal family? **1 / 1 point**

- 1000002
- 999997
- 1000003

Correct
This is a prime number bigger than 1000000.

4. How can one build a universal family of hash functions for integers between -1000000 (minus one million) and 1000000 (one million)? **1 / 1 point**

- First, add 1000000 to each integer and get the range of integers between 0 and 2000000. Then use the universal family for integers with $p = 2000003$.
- Take the universal family for integers with $p = 1000003$.
- First, add 1000000 to each integer. Then use the universal family for integers with $p = 1000003$.

Correct