

HC2 2012 Gift

(3) Tomorrow is Mystery

Use your creativity, there are so many strategies to solve this subtask!
Here is one that discards at least a third of the candidate years by asking 4 questions.

Choose $X < Y$ to roughly divide the interval in three. Then ask X, Y, Y, X .

This technique is called "Ternary Search". The approx. number of queries is

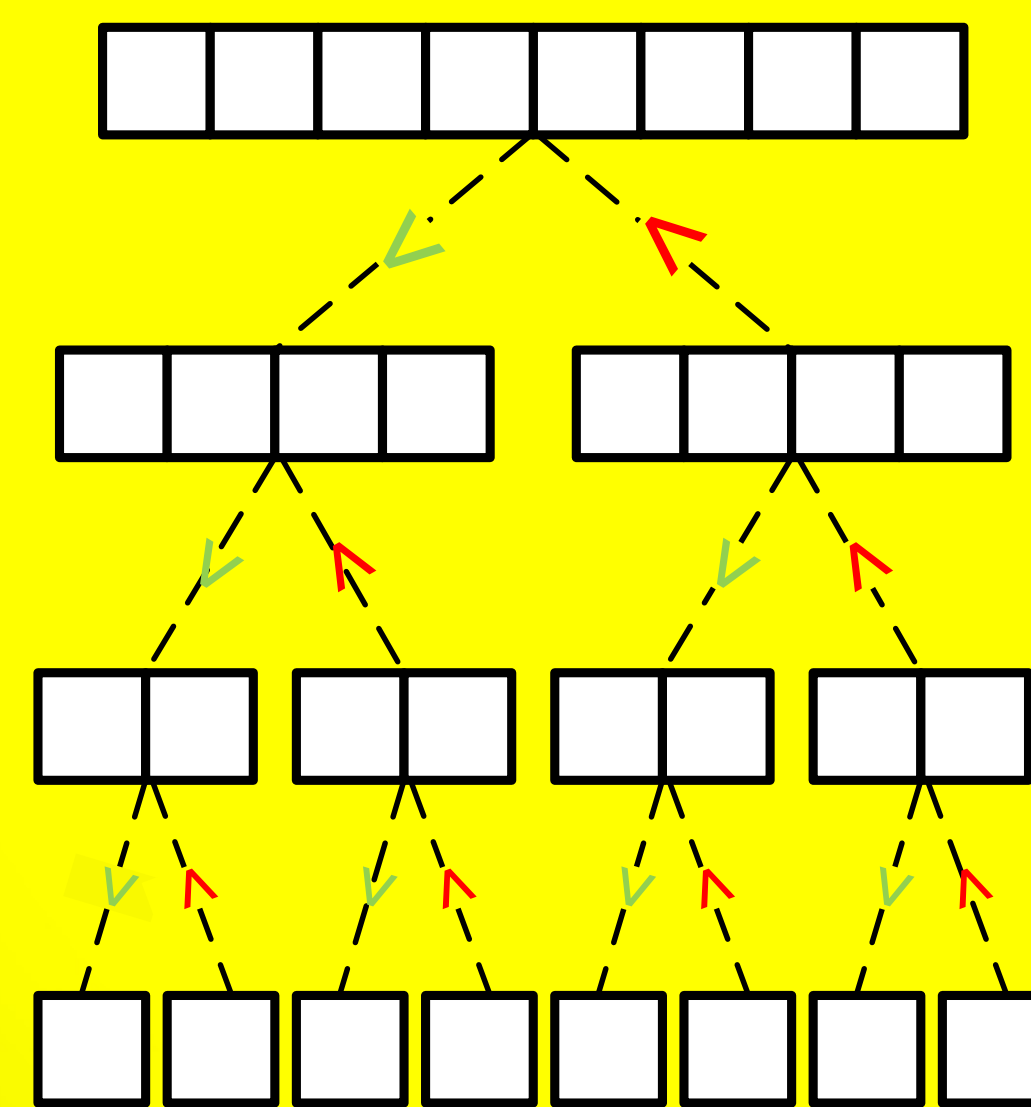
$$4 \log_3 (10^6) = 136$$

Answers Implication

X	Y	Y	X	X	Y
<	<	<	<	■	■
<	<	<	>	■	■
<	<	>	<	■	■
<	<	>	>	■	■
<	>	<	<	■	■
<	>	<	>	■	■
<	>	>	<	■	■
<	>	>	>	■	■
>	<	<	<	■	■
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>	>	>	<	■	■
>	>	>	>	■	■

(2) Yesterday is History

Each answer will allow you to discard the years before or after your query. To eliminate as many years as possible, cut the interval in the middle!



This is called "Binary Search" and the number of queries is at most

$$\lceil \log_2 (10^6) \rceil = 20$$

(1) Today is a Gift

"But today is a gift -- that's why they call it the present!"

return 2012;