Suppose \( alloc \) allocates 1 unit of memory space and takes time 1 to do so. Then the following computation slowly allocates memory:

\[
\text{GrowSlow} \Leftarrow \text{if } t = 2x \text{ then } alloc \| x := t \text{ else } t := t+1 \text{ fi.
}
\]

GrowSlow

If the time is equal to \( 2x \), then one space is allocated, and concurrently \( x \) becomes the time stamp of the allocation; otherwise the clock ticks. The process is repeated forever. Prove that if the space is initially less than the logarithm of the time, and \( x \) is suitably initialized, then at all times the space is less than the logarithm of the time.

§ see book Subsection 9.0.1