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

\[
\text{GrowSlow} \leftarrow \text{if } t = 2^{x} \text{ then alloc } \parallel x := t \text{ else } t := t + 1 \text{ fi}
\]

If the time is equal to \( 2^{x} \), then one space is allocated, and in parallel \( x \) 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.