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

GrowSlow $\Longleftarrow$ **if** $t{=}2{\times}x$ **then** *alloc* $\|$ $x{:=}\,t$ **else** $t{:=}\,t{+}1$ **fi**. *GrowSlow*

If the time is equal to $2{\times}x$, 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