

# Problem

Let  $S_0, S_1, S_2, \dots$  be a sequence of positive integers such that  $(S_{i-1} + S_{i+1})/S_i$  is an integer for every  $i \geq 1$ . Show that one of the following conditions must hold:

- (i)  $(S_i)$  contains a term equal to  $\gcd(S_0, S_1)$ .
- (ii)  $\lim_{i \rightarrow \infty} S_i = \infty$ .

*(“Power question” for the Duke Math Meet, 1998)*  
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