

## Problem 3 (due Monday, October 12)

An outcome of flipping a coin  $n$  times is called  $k$ -lucky if it contains a pattern which is repeated  $k$  times in a row. For example, the outcome THHTHTHTTH (T stands for "tails" and H for "heads") of flipping a coin 10 times is 3-lucky since HT appears 3 times in a row. Let  $P_n$  be the probability that flipping a coin  $n$  times is  $k$ -lucky. Find  $t$  as small as you can so that  $P_n < t$  for all  $n$ .

Only one solution was received, from Yuqiao Huang. His solution and some additional comments are contained in the following link [Solution](#)

From:

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