

# Lengthening $m$ -sequences with shift sequences

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$m$ -sequences are maximal length sequences with nice properties in their balance, runs, and auto-correlation. Shift sequences allow us to combine multiple copies of a sequence into a longer sequence. First we'll look at equivalence classes of shift sequences. Then we will investigate the special cases where the longer sequence created from an  $m$ -sequence is also an  $m$ -sequence.