

529 (repetition) Write a program to read an infinite sequence, and after every even number of inputs, to output a binary value saying whether the second half of the input so far is a repetition of the first half.

After trying the question, scroll down to the solution.

§ Let the reading channel be c , and let the writing channel be d . The specification is S , defined as

$$S = \forall n: \text{nat}. \mathcal{M}d_{wd+n} = (\mathcal{M}c_{rc;..rc+n} = \mathcal{M}c_{rc+n;..rc+2 \times n})$$

Let f (first) and s (second) be string variables, and define specification P as

$$P = \forall n: \text{nat}. \mathcal{M}d_{wd+n} = (f; \mathcal{M}c_{rc;..rc+n} = s; \mathcal{M}c_{rc+n;..rc+2 \times n})$$

The refinements are

$$S \Leftarrow f:= \text{nil}. s:= \text{nil}. P$$

$$P \Leftarrow d! f=s. c?. s:= s;c. c?. f:= f;s_0. s:= s_1;..\leftrightarrow s;c. P$$