The theory of Streams

true

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Ceremonial imports :

Let us define streams (they are the final coalgebra of a certain functor).

Let us define the function that extracts even indexed elements.

Similary, we construct the function that extracts odd indexed elements.

We now define bisimulation relations for streams

Okay, now we have a proof of coinductive extensionality!

Now we must show our equation.

Now let us define the merge operation for streams. The merge operation takes the first element from the left stream and the second element from the second stream.

The Even Odd Merger Theorem

The time has come for us to make our biggest theorem yet.

For the proof, we need a simple lemma :

We will start with the bisimulation lemma and the actual proof would be a simple application of extensionality.

Predicates and Temporal Logic

We define a predicate as a family of types indexed by the state space.