Set-once memory

Set-once memory is a special kind of synchronous memory with the following constraints.

- Multiple fibers can access the memory.
- We initialize the memory at most once, during the first `<code>set</code>` operation.
- We spin until the thunk has evaluated.

Our implementation has the following signature. The `<code>new</code>` operation creates a set-once cell. The `<code>get</code>` operation obtains the value of the cell. This operation spins if the thunk is already evaluating.

type `'a set_once_mem

type `'a thunk = unit -> `'a

val new : `'a thunk -> `'a set_once_mem
val get : `'a set_once_mem -> `'a

We can completely specify the behavior of set-once memory in terms of futures.

type `'a set_once_mem = `'a future

fun set sm = (
  case poll sm
  of NONE => touch sm
  SOME v => v
  (* end case *))