Further Modula-3

The thread system in Modula-3 uses mutexes and condition variables to control concurrency. An alternative scheme would be to use message passing.

Each message-passing channel would be an object with two methods:

send (message: REFANY)

and

receive (): REFANY

plus an initialisation method.

Calling send would append the argument to a (fixed-length) FIFO queue of data which would be collected by the thread calling receive. The thread would block if receive were called when the queue was empty or if send were called when the buffer was full.

Write an interface, Message, defining a suitable opaque object type with init and send methods, and write a further interface MessageInternal revealing the receive method. [8 marks]

Write an implementation exporting to both of these interfaces supplying the concrete revelations of the types and providing appropriate default methods. [12 marks]