Finding Cheryl’s birthday with DEMO

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1 Source Code

Download DEMO_S5.hs and EREL.hs from http://homepages.cwi.nl/~jve/software/demo_s5 and put them in the same directory. Then you can use runhaskell cheryl.lhs.

```haskell
module Main where
import DEMO_S5
import Data.List
import Data.Function

possibilities :: [(Int, String)]
possibilities = [(15,'May'),(16,'May'),(19,'May'),
                 (17,'June'),(18,'June'),(14,'July'),(16,'July'),
                 (14,'August'),(15,'August'),(17,'August')]

init_Cheryl :: EpistM (Int, String)
init_Cheryl = Mo possibilities [a,b] [] rels possibilities where
  rels = [ (a, groupBy ((==) 'on ' snd) possibilities ),
           (b, groupBy ((==) 'on ' fst) (sortBy (compare 'on ' fst) possibilities) ) ]

knWhich :: Agent -> Form (Int, [Char])
knWhich i = Disj [ Kn i (Info s) | s <- possibilities ]

listWorlds :: EpistM (Int, String) -> IO ()
listWorlds (Mo _ _ _ _ actuals) = putStrLn (" --> " ++ (show actuals))

main :: IO ()
main = do
  putStrLn "We start with all possibilities."
  listWorlds init_Cheryl
  putStrLn "Albert: I don’t know when Cheryl’s birthday is and I know that Bernard does not know."
  let model2 = ( upd_pa init_Cheryl ( Conj [Ng $ knWhich a, Kn a $ Ng (knWhich b)]) )
  listWorlds model2
  putStrLn "Bernard: Now I know when Cheryl’s birthday is."
  let model3 = ( upd_pa model2 ( knWhich b))
  listWorlds model3
  putStrLn "Albert: Now I also know when Cheryl’s birthday is."
  let model4 = ( upd_pa model3 ( knWhich a))
  listWorlds model4
  putStrLn "Bye bye."

2 Output

We start with all possibilities.
Albert: I don’t know when Cheryl’s birthday is and I know that Bernard does not know.
Bernard: Now I know when Cheryl’s birthday is.
-->(16,"July"),(15,"August"),(17,"August")
Albert: Now I also know when Cheryl’s birthday is.
-->(16,"July")
Bye bye.
```