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-- Model solution for Lab08
--
-- Copyright [2001..2004] Manuel M. T. Chakravarty

module Lab08
where

import Prelude hiding (lookup)
import List           (nub)

import BookVideoCD
import ProductDB

-- obtain a list of book authors without duplicates
--
bookAuthors      :: [Product] -> [Author]
bookAuthors products = nub (bookAuthors' products)
  where
    bookAuthors' [] = []
    bookAuthors' (Book _ author : products) = author : bookAuthors products
    bookAuthors' (_ : products) = bookAuthors products

-- pretty print a product
--
showProduct :: Product -> String
showProduct (Book title author _) =
  "Book : \" ++ title ++ "\", \" ++ author
showProduct (Video title _) =
  "Video: \" ++ title ++ "\""
showProduct (CD title artist tracks) =
  "CD : \" ++ title ++ "\", \" ++ artist ++ "; \" ++ show tracks ++ " tracks"

-- pretty print a complete product list (one product per line)
--
showProducts      :: [Product] -> String
showProducts products = unlines (map showProduct products)

-- lookup a product by title
--
lookupTitle      :: Title -> [Product] -> Maybe Product
lookupTitle title [] = Nothing
lookupTitle title (product:products)
  | title == getTitle product = Just product
  | otherwise = lookupTitle title products

-- extract a list of products matching a list of titles
--
lookupTitles     :: [Title] -> [Product] -> [Product]
lookupTitles titles products = joinProducts (map lookupInProducts titles)
  where
    lookupInProducts title = lookupTitle title products

-- extract all products in a maybe list of products into a simple product list
--
joinProducts     :: [Maybe Product] -> [Product]
joinProducts [] = []
joinProducts (Nothing : products) = joinProducts products
joinProducts (Just product : products) = product : joinProducts products

-- lookup a value in an association list returning 'Nothing' if the key
-- cannot be found
--
lookup           :: Eq a => a -> [(a, b)] -> Maybe b
lookup key [] = Nothing
lookup key ((key', value) : kvs)
  | key == key' = Just value
  | otherwise = lookup key kvs

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