

```

-- Model solution for Lab05
--
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module Lab05
where

-- Tests whether a list is a superlist of another one
--
-- Examples: [3,2,1] `superlist` [1..2] = True
--           [3,1]  `superlist` [1..2] = False
--           [3,1]  `superlist` []     = True
--
superlist          :: Eq a => [a] -> [a] -> Bool
superlist _ []     = True
superlist ys (x:xs) = x `elem` ys && superlist ys xs

-- Split a list into two depending on whether the elements are smaller or
-- bigger than a fixed number
--
-- Examples: split 6 [5,3,6,8,9,3,2,1,4,7,8,9,7] =
--           ([5,3,6,3,2,1,4],[8,9,7,8,9,7])
--           split 9 [1..10]                      = ([1,2,3,4,5,6,7,8,9],[10])
--
split              :: Int -> [Int] -> ([Int], [Int])
split median []    = ([], [])
split median (x:xs) | x <= median = let (ss, gs) = split median xs
in
    (x:ss, gs)
    | otherwise      = let (ss, gs) = split median xs
in
    (ss, x:gs)

-- An alternative version
--
-- We didn't discuss this syntax in the lecture, but a 'where' clause is
-- valid in all preceding alternatives that are distinguished by guards (this
-- leads to a shorter and more elegant solution to split); moreover, the
-- definition works, in fact, on all types that have an ordering (not only
-- integers)
--
split'             :: Ord a => a -> [a] -> ([a], [a])
split' median []   = ([], [])
split' median (x:xs) | x <= median = (x:ss, gs)
                    | otherwise    = (ss, x:gs)
where
    (ss, gs) = split' median xs

-- Quicksort
--
qsort             :: Ord a => [a] -> [a]
qsort []          = []
qsort (x:xs)      = qsort ss ++ [x] ++ qsort gs
where
    (ss, gs) = split' x xs

-- Movie database
--
type MovieList = [(String, Bool)] -- title, rented

movies = [("The Matrix"   , False),
          ("Strange Days", True ),
          ("Blade Runner" , False)]

-- Mark a newly rented movie in the database
--
-- Examples: rent movies "Blade Runner" =
--           [("The Matrix",False),("Strange Days",True),
--           ("Blade Runner",True)]

```

