

```

-- Model solution for Lab06
--
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module Lab06
where

-- Sieve of Eratosthenes - compute the prime numbers up to a given maximum
--
-- Example: sieve 20 = [2,3,5,7,11,13,17,19]
--
sieve :: Int -> [Int]
sieve n = sieve' [2..n]
  where
    sieve' :: [Int] -> [Int]
    sieve' [] = []
    sieve' (x:xs) = x : sieve' (removeMultiples x xs)
    --
    removeMultiples :: Int -> [Int] -> [Int]
    removeMultiples x [] = []
    removeMultiples x (y:ys) | x * x > n = y:ys
                              | y `mod` x == 0 = removeMultiples x ys
                              | otherwise = y : removeMultiples x ys

-- 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) ]
--           rent movies "Strange Days"
--           => error message
--           rent movies "Final Fantasy"
--           => [ ("The Matrix",False), ("Strange Days",True),
--               ("Blade Runner",False) ]
--
rent :: MovieList -> String -> MovieList
rent movies movie = map update movies
  where
    update (movie', rented)
      | movie' == movie && rented =
          error "rent: movie already rented"
      | movie' == movie && not rented = (movie', True)
      | otherwise = (movie', rented)

```