

Relation Haskell Exercises

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- 1 Based on
- 2 Relations R
 - Using REL.hs

"The Haskell Road to Logic, Maths, and Programming", K. Doets and J. V. Eijck

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Using REL.hs

```
module REL

where

import List
import SetOrd

                                :load REL
```

Relation Composition

```
Prelude> :load REL
[1 of 2] Compiling SetOrd      ( SetOrd.hs, interpreted )
[2 of 2] Compiling REL        ( REL.hs, interpreted )
Ok, modules loaded: REL, SetOrd.
*REL> r
{(0,2),(0,3),(1,0),(1,3),(2,0),(2,3)}
*REL> r2
{(0,0),(0,3),(1,2),(1,3),(2,2),(2,3)}
*REL> r3
{(0,2),(0,3),(1,0),(1,3),(2,0),(2,3)}
*REL> r4
{(0,0),(0,3),(1,2),(1,3),(2,2),(2,3)}
*REL>
```

divisor pairs of n

```
divisors :: Integer -> [(Integer, Integer)]
divisors n = [ (d, quot n d) | d <- [1..k], rem n d == 0]
  where k = floor (sqrt (fromInteger n))
```

prime

```
prime'' = Integer -> Bool  
prime'' = \n -> divisors n == [(1,n)]
```

proper divisor

```
divs :: Integer -> [Integer]
divs n = (fst list) ++ reverse (snd list)
  where list = unzip (divisors n)

properDivs :: Integer -> [Integer]
properDivs n = init (divs n)

perfect :: Integer -> Bool
perfect n = sum (properDivs n) == n
```