Haskell — Infinite lists P98957_en

The goal of this problem is to work the definition of infinite lists. In particular, you are required to define functions that generate infinite lists to:

1. Generate the sequence of ones $[1, 1, 1, 1, 1, 1, 1, 1, \ldots]$.
2. Generate the sequence of the natural numbers $[0, 1, 2, 3, 4, 5, 6, 7 \ldots]$.
3. Generate the sequence of the integer numbers $[0, 1, -1, 2, -2, 3, -3, 4 \ldots]$.
4. Generate the sequence of the triangular numbers: $0, 1, 3, 6, 10, 15, 21, 28, \ldots]$.
5. Generate the sequence of the factorial numbers: $[1, 1, 2, 6, 24, 120, 720, 5040, \ldots]$.
6. Generate the sequence of the Fibonacci numbers: $[0, 1, 1, 2, 3, 5, 8, 13, \ldots]$.
7. Generate the sequence of prime numbers: $[2, 3, 5, 7, 11, 13, 17, 19, \ldots]$.
8. Generate the ordered sequence of the Hamming numbers: $[1, 2, 3, 4, 5, 6, 8, 9, \ldots]$. The Hamming numbers are those that only have 2, 3 and 5 as prime divisors.
9. Generate the *look-and-say* sequence: $[1, 11, 21, 1211, 111221, 312211, 13112221, 1113213211, \ldots]$.
10. Generate the sequences of rows of the Tartaglia triangle (also known as Pascal's triangle): $[[1], [1, 1], [1, 2, 1], [1, 3, 3, 1], \ldots]$.

Specification

Define the following functions:

ones :: [**Integer**]
nats :: [**Integer**]
ints :: [**Integer**]
triangulars :: [**Integer**]
factorials :: [**Integer**]
fibs :: [**Integer**]
primes :: [**Integer**]
hammings :: [**Integer**]
lookNsay :: [**Integer**]
tartaglia :: [[**Integer**]]

Observation

In this problem you cannot use infinite enumerations such as [1..], but you are advised to use higer-order functions such as *map*, *scanl*, *iterate*, *filter*, ...

Scoring

Each function score 10 points.

Sample input 1

```
take 8 ones
take 8 nats
take 8 ints
take 8 triangulars
take 8 factorials
take 8 fibs
take 8 primes
take 8 hammings
take 8 lookNsay
take 6 tartaglia
```

Sample output 1

```
[1,1,1,1,1,1,1,1]
[0,1,2,3,4,5,6,7]
[0,1,-1,2,-2,3,-3,4]
[0,1,3,6,10,15,21,28]
[1,1,2,6,24,120,720,5040]
[0,1,1,2,3,5,8,13]
[2,3,5,7,11,13,17,19]
[1,2,3,4,5,6,8,9]
[1,11,21,1211,111221,312211,13112221,1113213211]
[[1],[1,1],[1,2,1],[1,3,3,1],[1,4,6,4,1],[1,5,10,10,5,1
```

Problem information

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