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The Virtual Learning Environment for Computer Programming

99 problems in Haskell - Part 1 (Lists) P65945_en

1. $\mathit{myLast} :: [a] \rightarrow a$

   Find the last element of a list. Assume the list is non empty.

2. $\mathit{myButLast} :: [a] \rightarrow a$

   Find the last but one element of a list. Assume the list has, at least, two elements.

3. $\mathit{elementAt} :: \mathbf{Int} \rightarrow [a] \rightarrow a$

   Find the k-th element of a list. The first element in the list is number 1. Assume the list has, at least, k elements.

4. $\mathit{myLength} :: [a] \rightarrow \mathbf{Int}$

   Find the number of elements of a list.

5. $\mathit{myReverse} :: [a] \rightarrow [a]$

   Reverse a list.

6. $\mathit{isPalindrome} :: (\mathbf{Eq}\ a) \Rightarrow [a] \rightarrow \mathbf{Bool}$

   Find out whether a list is a palindrome.

7. $\mathit{myFlatten} :: [[a]] \rightarrow [a]$

   Flatten a two-level nested list structure.

8. $\mathit{compress} :: (\mathbf{Eq}\ a) \Rightarrow [a] \rightarrow [a]$

   Eliminate consecutive duplicates of list elements.

9. $\mathit{pack} :: (\mathbf{Eq}\ a) \Rightarrow [a] \rightarrow [[a]]$

   Pack consecutive duplicates of list elements into sublists. If a list contains repeated elements they should be placed in separate sublists.

10. $\mathit{encode} :: (\mathbf{Eq}\ a) \Rightarrow [a] \rightarrow [(\mathbf{Int}, a)]$

    Run-length encoding of a list. Consecutive duplicates of elements are encoded as lists (n, e) where n is the number of duplicates of the element e.

Scoring

Each item scores 10 points.

Sample input 1

```
myLast [1..5]
myLast "hello"
myButLast [1..5]
elementAt 3 [1..5]
myLength [1..5]
myReverse [1..5]
isPalindrome "madam"
myFlatten [[1..5],[3..4],[2..4]]
compress "aaacaabb"
pack "aaacaabb"
encode "aaacaabb"
```

Sample output 1

```
5
'o'
4
3
5
[5,4,3,2,1]
True
[1,2,3,4,5,3,4,2,3,4]
"acab"
["aaa","c","aa","bb"]
[(3,'a'),(1,'c'),(2,'a'),(2,'b')]
```

Problem information

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