product

(Haskell library functions) Sunday 30th October, 2016

length

(Haskell library functions) Sunday 30th October, 2016

reverse

(Haskell library functions) Sunday 30th October, 2016

insert

(Haskell library functions) Sunday 30th October, 2016

zip

(Haskell library functions) Sunday 30th October, 2016

drop

(Haskell library functions) Sunday 30th October, 2016

map (basic)

(Haskell library functions) Sunday 30th October, 2016

map (recursive)

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filter

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filter (recursive)

(Haskell library functions) Sunday 30th October, 2016

$$\begin{array}{lcl} \mathit{length} & :: & [a] \to \mathit{Int} \\ \mathit{length}\ [] & = & 0 \\ \mathit{length}\ [\_ : \mathit{xs}] & = & 1 + \mathit{length}\ \mathit{xs} \end{array}$$

$$\begin{array}{lcl} \mathit{product} & :: & \mathit{Num}\ a \Rightarrow [a] \to a \\ \mathit{product}\ [] & = & 1 \\ \mathit{product}\ (n : \mathit{ns}) & = & n * \mathit{product}\ \mathit{ns} \end{array}$$

$$\begin{array}{lcl} \mathit{insert} & :: & \mathit{Ord}\ a \Rightarrow a \to [a] \to [a] \\ \mathit{insert}\ x\ [] & = & [x] \\ \mathit{insert}\ x\ (y : \mathit{ys}) \mid x \leq y & = & x : y : \mathit{ys} \\ \qquad\qquad \mid \mathit{otherwise} & = & y : \mathit{insert}\ x\ \mathit{ys} \end{array}$$

$$\begin{array}{lcl} \mathit{reverse} & :: & [a] \to [a] \\ \mathit{reverse}\ [] & = & [] \\ \mathit{reverse}\ (x : \mathit{xs}) & = & \mathit{reverse}\ \mathit{xs} +\!\!+ [x] \end{array}$$

$$\begin{array}{lcl} \mathit{drop} & :: & \mathit{Int} \to [a] \to [a] \\ \mathit{drop}\ 0\ \mathit{xs} & == & \mathit{xs} \\ \mathit{drop}\ (n+1)\ [] & == & [] \\ \mathit{drop}\ (n+1)\ (\_ : \mathit{xs}) & == & \mathit{drop}\ n\ \mathit{xs} \end{array}$$

$$\begin{array}{lcl} \mathit{zip} & :: & [a] \to [b] \to [(a,b)] \\ \mathit{zip}\ []\ \_ & == & [] \\ \mathit{zip}\ \_\ [] & == & [] \\ \mathit{zip}\ (x : \mathit{xs})\ (y : \mathit{ys}) & == & (x,y) : \mathit{zip}\ \mathit{xs}\ \mathit{ys} \end{array}$$

$$\begin{array}{lcl} \mathit{map} & :: & (a \to b) \to [a] \to [b] \\ \mathit{map}\ f\ [] & == & [] \\ \mathit{map}\ f\ \mathit{xs} & == & f\ x : \mathit{map}\ f\ \mathit{xs} \end{array}$$

$$\begin{array}{lcl} \mathit{map} & :: & (a \to b) \to [a] \to [b] \\ \mathit{map}\ f\ \mathit{xs} & == & [f\ x \mid x \leftarrow \mathit{xs}] \end{array}$$

$$\begin{array}{lcl} \mathit{filter} & :: & (a \to \mathit{Bool}) \to [a] \to [a] \\ \mathit{filter}\ p\ [] & = & [] \\ \mathit{filter}\ p\ (x : \mathit{xs}) \mid p\ x & == & x : \mathit{filter}\ p\ \mathit{xs} \\ \qquad\qquad \mid \mathit{otherwise} & == & \mathit{filter}\ p\ \mathit{xs} \end{array}$$

$$\begin{array}{lcl} \mathit{filter} & :: & (a \to \mathit{Bool}) \to [a] \to [a] \\ \mathit{filter}\ p\ \mathit{xs} & == & [x \mid x \leftarrow \mathit{xs}, p\ x] \end{array}$$