stackoverflow

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How to split a string in Haskell?

How do I split a string on a custom separator? I want the follo[illegible]ehavior:

```
split ‘,’ “my,comma,separated,list”  → [[illegible]ed”, “list”]
```

wanted: automatic programmer's assistant

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You can implem[illegible]

```
split :: Char -> String -> [String]
split c s = case dropWhile (== c) s of
                  "" -> []
                  s' -> w : split c s’’
  where (w, s'') = break (== c) s'
```

api search with hoogle

Hoogλe

`(a -> b) -> [a] -> [b]`

Search

```
map :: (a -> b) -> [a] -> [b]
```

Data.List

`map f xs` is the list obtained by applying `f` to each element of `xs`, i.e.,

```
map f [x1, x2, ..., xn] == [f x1, f x2, ..., f xn]
```

hoogle needs synthesis!

Hoogλe

```
(a -> Maybe b) -> [a] -> Int
```

Search

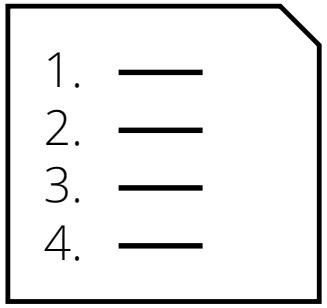
No results found!

hoogle+

specification

```
(a -> Maybe b)
  -> [a] -> Int
```

programs



Haskell libraries

future work

1. scaling up the search
2. eliminating irrelevant results
3. result comprehension
4. user interaction

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three kinds of irrelevant results

type query: `xs:[Maybe a] → d:a → a`

1. discard arguments

```
\xs d → d
```

polymorphism
makes this worse

2. always crash

```
\xs d → foldr (head []) d xs
```

3. duplicates

```
\xs d → fromMaybe d (head xs)
```

```
\xs d → maybe d id (head xs)
```

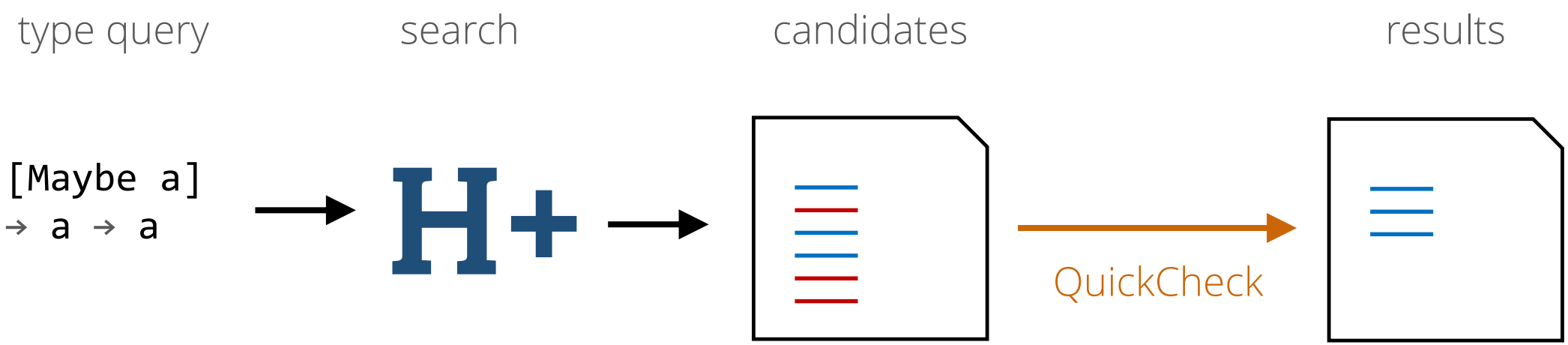
substructural types

program	variable use	structural unrestricted	relevant *at least* once	linear *exactly* once
`\xs d → d`		✅	❌	❌
`\xs d → bool d d (null xs)`		✅	✅	❌
`\xs d → fromMaybe d (listToMaybe (catMaybes xs))`		✅	✅	✅

definitely useless

likely useless

test-based filtering



1. find an input where c returns a value vs crashes/diverges (tricky with infinite data structures!)
2. find an input where c1 and c2 are different

future work

1. scaling up the search
2. eliminating irrelevant results
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future work: comprehension

Hoogλe+

```
xs:[Maybe a] -> x:a -> a
```

Search

```
fromMaybe x (head xs)
```

```
fromMaybe x (last xs)
```

```
fromMaybe x (listToMaybe (catMaybes xs))
```

how do I know what these programs do?

future work: comprehension

Hoogλe+

```
xs:[Maybe a] -> x:a -> a
```

Search

```
fromMaybe x (head xs)
```

```
[]                0 -> error
[Just 5, Nothing] 0 -> 5
```

```
fromMaybe x (last xs)
```

```
[]                0 -> error
[Just 5, Nothing] 0 -> 0
```

```
fromMaybe x (listToMaybe (catMaybes xs))
```

```
[]                0 -> 0
[Just 5, Nothing] 0 -> 5
```

future work

1. scaling up the search
2. eliminating irrelevant results
3. result comprehension
4. user interaction

Hoogle+

Welcome to the Hoogle+ Demo

Hoogle+ is a type-driven synthesis engine for Haskell - like Hoogle but able to find compositions of functions. Given a Haskell type, Hoogle+ generates terms that inhabit this type by composing library components. It supports polymorphism, type classes, and higher-order functions. Available library components are listed in the side bar.

n:Int -> xs:[a] -> [a]

Example Specifications:

New	arg0	arg1	result

No data

Arguments

- +

Search

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\n xs -> GHC.List.drop n xs

drop n xs returns the suffix of xs after the first n elements, or [] if n > length xs: drop 6 "Hello World!" == "World!" drop 3 [1,2,3,4,5] == [4,5] drop 3 [1,2] == [] drop 3 [] == [] drop (-1) [1,2] == [1,2] drop 0 [1,2] == [1,2] It is an instance of the more general genericDrop, in which n may be of any integral type.

		arg0	arg1	result
Edit	Keep usage	4	[1,2,3]	[]
Edit	Keep usage	2	[1,1,1]	[1]
Edit	Keep usage	2	[Just 5, Nothing, Just 1]	[Just 1]

drop :: Int -> [a]

n :: Int

xs :: [a]