Building Data Structures in Swift

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Swift swift.org

A comparison to python python.org

Reconstructing data structures found in traditional languages

Swift is a modern, object-orientated language for programming iPhone and Apple products.

1. Type safe & object orientated
2. Supports advanced documentation & version control strategies
3. Supports modern international character sets
4. Java-like language with closures.
   The code is treated like an object, similar to `lambda` in Python

Swift is a variable type-safe language.
This prevents passing an `Int` where the code expects a `String`.

```
// Swift has single
// line comments
/* as well as
   multi-line comments.
*/
```

examples of variables and constants:

```
let π = 3.14159
let 你好 = "你好世界"
let 🐶🐮 = "dogcow"
```

inferred

```
var face =  "a string variable in Swift"
```

specified

```
   // a variable of type string
var welcomeMessage: String = "hello"
let bigNumber: Int = 127
```

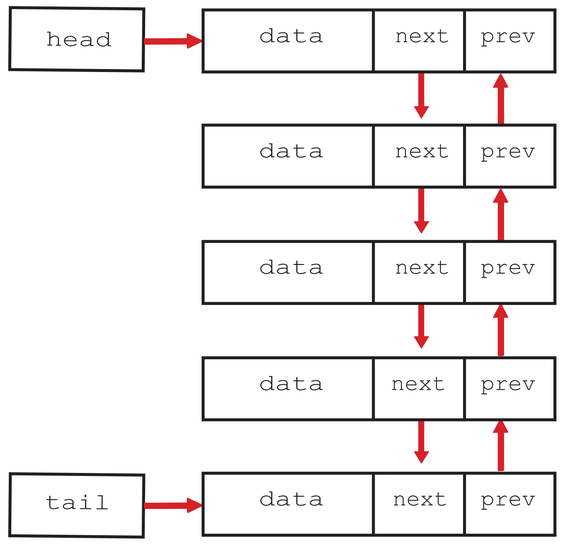
generic

```
func swapTwoValues<T>(_ a: T, _b: T)
   // _ allows for an unspecified function parameter
```

Swift uses closures to specify new control mechanisms.
This prints each character on a line by itself.

```
welcomeMessage.forEach(){
   print($0)
}
```

```
/*
Example:
DoubleLinkedList
   next: refers to tail, or following (self + 1) node. Is a pointer
   prev: refers to head, or previous (self - 1) node. Is a pointer.
   data: contains value. Is the data stored in the node.
   head: points to the first node in the list.
   tail: points to the last node in the list.
*/
```




```
Class DoubleLinkedList<T>: Sequence {
   // Head and tail are non-optional variables.

   var head = DoubleNode<T>()
   var tail = DoubleNode<T>()
   var count: Int {
      ... // some properties can be computed
   }
   func popLast() -> T? {
      if count == 0 {
         return nil
      }
      else {
         let result = tail.prev!.data!
         removeNode(tail.prev!)
         return result
      }
   }
```

```
# Python has single line comments
""" as well as
    multi-line comments
"""
```

Pythonis a data-based type-safe language.
4 cannot be added to the string "three"

Python types are inferred.

```
name = "you" # string variable, mutable
name = 42 # integer variable
d = 42.0 # float variable
```

Python uses
indentation
to determine
operation order.

Results

Converted a dozen data structures into Swift, including:

```
linked lists
double linked lists
circular lists
```

Gained experience in the Xcode IDE, which has advanced version control options and git repository integration.

Developing an application for use with a scrolling marquee sign. This entails using Swift to build an application that organizes and presents information on the board for lab use. Development requires collecting data from RSS feeds and websites with Python scripts, and communicating with a serial device through a primative interface.