PEP Scala (3)

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Slides & Code: KEATS

```
def collatz(n: Long) : Long =
  {
    val toReturn = collatzHelper(n, 0)
    toReturn
  }
```

```
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```

```
def collatz(n: Long) : Long =
  collatzHelper(n, 0)
```

Default Arguments

```
def collatzHelper(n: Int, a: Int = 0) : Int = ...


collatzHelper(n, 3)
collatzHelper(n, 0)

collatzHelper(n)   // a = 0
```

Last Week: Options & HO Funs.

```
List(7,2,3,4,5,6).find(_ < 4)
res: Option[Int] = Some(2)
```

```
List(5,6,7,8,9).find(_ < 4)
res: Option[Int] = None
```

```
List(1,2,3,4,5).map(x => x * x)
res: List[Int] = List(1, 4, 9, 16, 25)
```

Web-Crawler (1)

```
def get_page(url: String) : String = {
Try(fromURL(url)(”ISO-8859-1”).take(10000).mkString)
   .getOrElse { println(s” Problem with: $url”); ””}
}
```

Web-Crawler (2)

```
val http_pattern = """https?://[\^"]*""".r
val email_pattern =
 """([a-z\d\.-]+)@([\da-z\.-]+)\.([a-z\.]{2,6})""".r


def unquote(s: String) = s.drop(1).dropRight(1)


def get_all_URLs(page: String): Set[String] =
  http_pattern.findAllIn(page).map(unquote).toSet

  // returns all URLs in a page
```

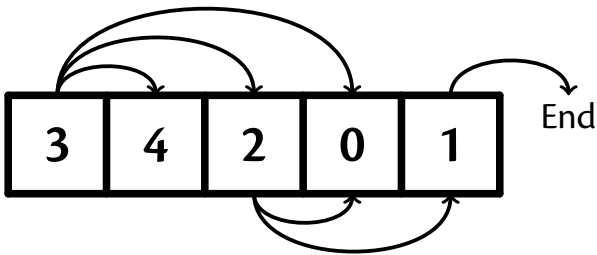
Web-Crawler (3)

```
def crawl(url: String, n: Int) : Unit = {
  if (n == 0) ()
  else {
    println(s"  Visiting: $n $url")
    val page = get_page(url)
    for (u <- get_all_URLs(page))
      crawl(u, n - 1)
  }
}
```

Email Harvester

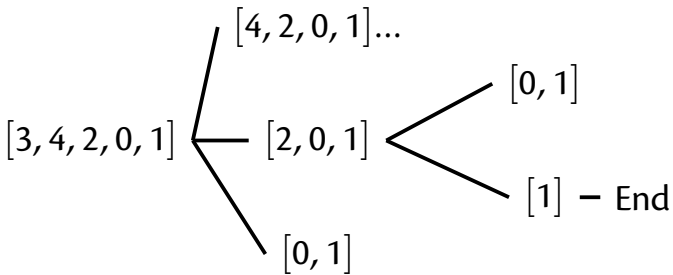
```
def emails(url: String, n: Int) : Set[String] = {
 if (n == 0) Set()
 else {
  println(s"  Visiting: $n $url")
  val page = get_page(url)
  val new_emails =
    email_pattern.findAllIn(page).toSet
  new_emails ++
    (for (u <- get_all_URLs(page))
       yield emails(u, n - 1)).flatten
 }
}
```

Jumping Towers



shortest: $3 \rightarrow 4 \rightarrow \text{End}$

next moves



Reverse Polish Notation

$$(3 + 1) * (2 + 9)$$

$$\Rightarrow$$

$$3\ \ 1\ +\ \ 2\ \ 9\ +\ *$$

Reverse Polish Notation

$$(3 + 1) * (2 + 9)$$

$$\Rightarrow$$

$$3\ \ 1\ +\ \ 2\ \ 9\ +\ *$$

```
ldc 3
ldc 1
iadd
ldc 2
ldc 9
iadd
imul
```