AN x64 processor is screaming along at billions of cycles per second to run the XNU kernel, which is frantically working through all the POSIX-specified abstraction to create the Darwin system underlying OS X, which in turn is straining itself to run Firefox and its Gecko renderer, which creates a Flash object which renders dozens of video frames every second because I wanted to see a cat jump into a box and fall over.

I am a god.

Announcements

Lab 5
March-April 2014

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Lab 5 Feature List

1. null
2. var declarations, var assignment, field assignment
3. functions with var mode
4. functions with ref mode
5. functions with name mode (subst calling avoidCapture)
6. casting (castOk)

A for expression

Example from OSV

Find all authors who have published at least two books

```scala
for (b1 <- books;
     b2 <- books if b1 != b2;
     a1 <- b1.authors;
     a2 <- b2.authors if a1 == a2)
  yield a1
```

Translated

A bit dense, but this is the actual computation on the underlying collection:

```scala
books flatMap
  { b1 => books withFilter { b2 => b1 != b2 } flatMap
    { b2 => b1.authors flatMap
      { a1 => b2.authors withFilter { a2 => a1 == a2 } map
        { a2 => a1 }
      }
    }
  }
```

Reminiscent of queries (SQL).

**Application: Twitter Scalding**

- Write queries in high-level Scala, translated to underlying Hadoop MapReduce
- Programming "big data" analytics
- Really at scale
- https://github.com/twitter/scalding
* Do With

* Do rules for mutation