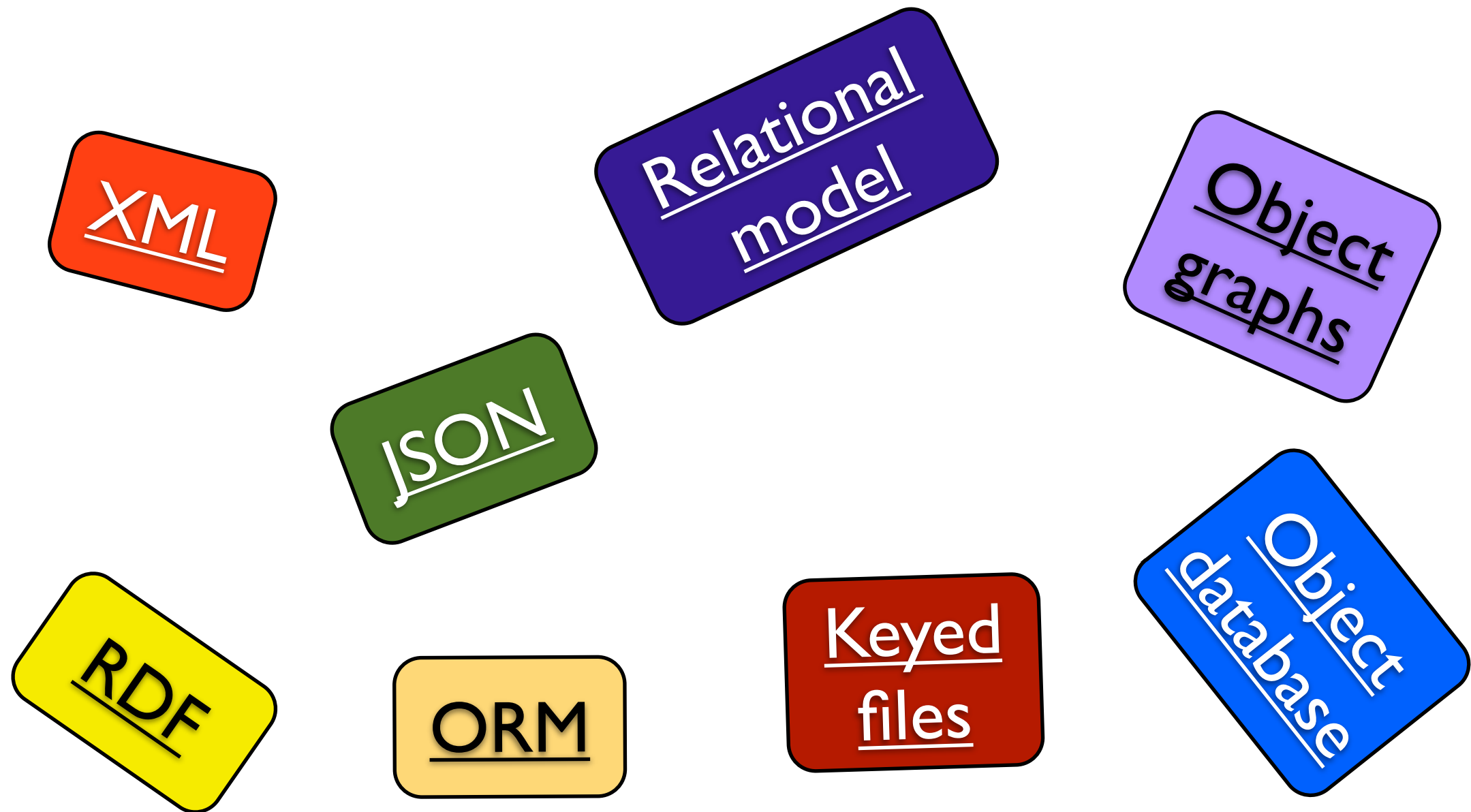


Modern Data Technologies

Software Languages Team
University of Koblenz-Landau
Ralf Lämmel and Andrei Varanovich

General models of data



Modern Applications

Amazon sold a record 158 items every second on Nov. 29

Comment

48

Recommend

87

Tweet

213

+1

0



By Douglas Stanglin, USA TODAY

Updated 2010-12-28 3:11 PM



▶ CAPTION

By Matt Cardy, Getty Images

Amazon.com has announced that on Nov. 29, its peak holiday shopping day, customers were buying online at a record-breaking 158 items per second, with the newest Kindle its best-selling product ever.

<http://content.usatoday.com/communities/ondeadline/post/2010/12/amazon-says-kindle-was-its-best-selling-product-ever-this-year/1#.UFADLaQtgsd>

Google



Google Search

I'm Feeling Lucky

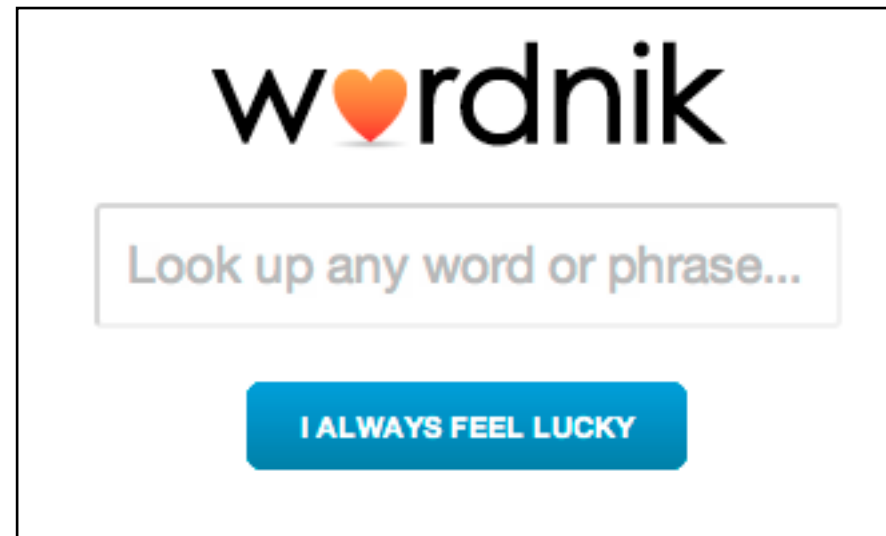
blekko *the spam-free search engine*



[/date](#) [/likes](#) [/news](#) [/gossip](#)

blekko's mission: blekko is a consumer facing search engine focused on delivering high quality, relevant, spam-free search results. We believe search should be open, transparent and collaborative. For this reason we combine traditional algorithmic search with the expertise of our users and partners to eliminate spam and deliver results from only the most reputable, best quality sites. This combination creates a highly differentiated editorial search experience that is fundamentally changing search and content discovery online.

<http://blekko.com/>



Wordnik is a new way to discover meaning. Wordnik shows definitions from multiple sources, so you can see as many different takes on a word's meaning as possible. For more information about the sources of our dictionary definitions, please see the [Colophon page](#).

<http://www.wordnik.com/>



Ralf Lämmel @reallynotabba

8 Sep

Andrei (@DrGigaBit) & me delivered a "modern web programming" course for #Debeka yesterday; all slideware is here: github.com/avaranovich/we...

[Collapse](#) [← Reply](#) [🗑 Delete](#) [★ Favorite](#)

2

RETWEETS

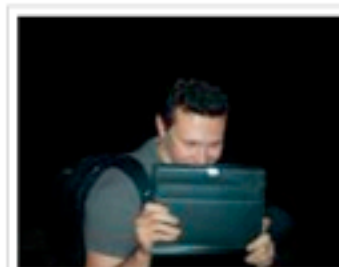
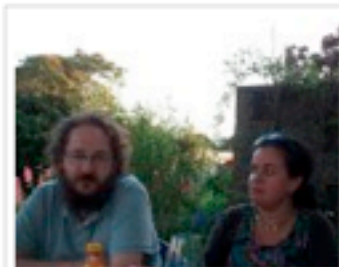
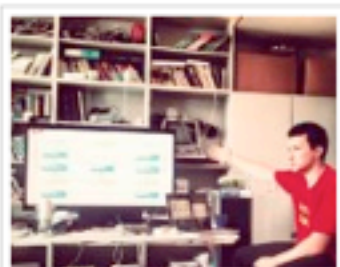
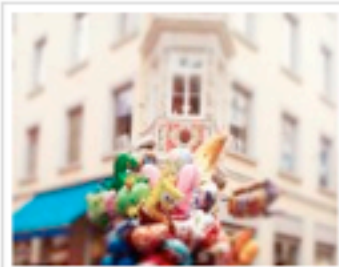
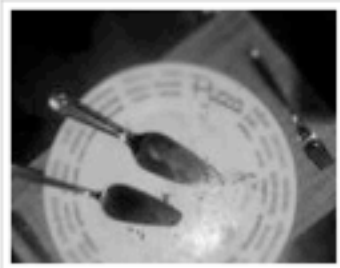
1

FAVORITE



10:36 AM - 8 Sep 12 · [Details](#)

<https://twitter.com/reallynotabba/status/244353505060614144>



A promotional banner for the game Mafia Wars. The top section features the game title 'Mafia Wars' in a large, stylized font, with 'OVER 20 MILLION PLAYERS' underneath. To the right, it says 'by zynga' and has a Facebook 'Log In' button. Below this is a navigation menu with buttons for 'GAME', 'HOME', 'FORUM', 'SUPPORT', 'BLOG', 'STORE', and 'GAME CARD'. The main part of the banner shows a man in a brown suit and hat against a night cityscape. A glowing neon sign says 'CHICAGO' and below it 'BECOME A LEGEND'. A 'Play Now' button is positioned at the bottom right of the main image. At the very bottom, there are links for 'Privacy | Terms of Service' and a copyright notice: 'All items including but not limited to user interface, design, game design, artwork and scoring system Copyright 2010 Zynga Game Network Inc. All rights reserved.'

<https://www.mafiawars.zynga.com/fbconnect?>

Pentaho Big Data Analytics Center

COMPLETE BIG DATA ANALYTICS AND VISUAL DATA MANAGEMENT



<http://www.pentaho.com/big-data/>

PREDICTIX FOR: APPAREL GROCERS HARDLINES

company news

M.Video Extends Its Relationship with Predictix by Rolling Out Assortment Planning, Store-Level Forecasting and Target Stock Optimization

1/16/2012

Russia's largest consumer electronics retailer on its third wave of rollouts of Predictix merchandising applications

Better by Design: Predictix Cloud 2.0 Solutions Help Solve Retail's Toughest Challenges, Including Big Data Analytics, Omni-Channel Retail and Promotional Forecast Accuracy

1/16/2012

Predictix showcases next-generation applications including forecasting, planning, assortment, pricing, promotions and replenishment at the NRF's BIG Show, Jan. 16 and...

key resources

AMR Research.

Predictix Leaps Ahead With A SaaS Delivered, Consumer Centric Merchandising Suite >>

Retail Assortment Management Leaders and Contenders >>

events

resources

talk to us

designed for the cloud
Better decisions by design
Big Data power on demand
Agile solutions that evolve
Anywhere, anytime access
Monthly subscription



NEW Apparel Thought Leadership Report

Access report >>

PRICING & PROMOTIONS

PLANNING & ASSORTMENT

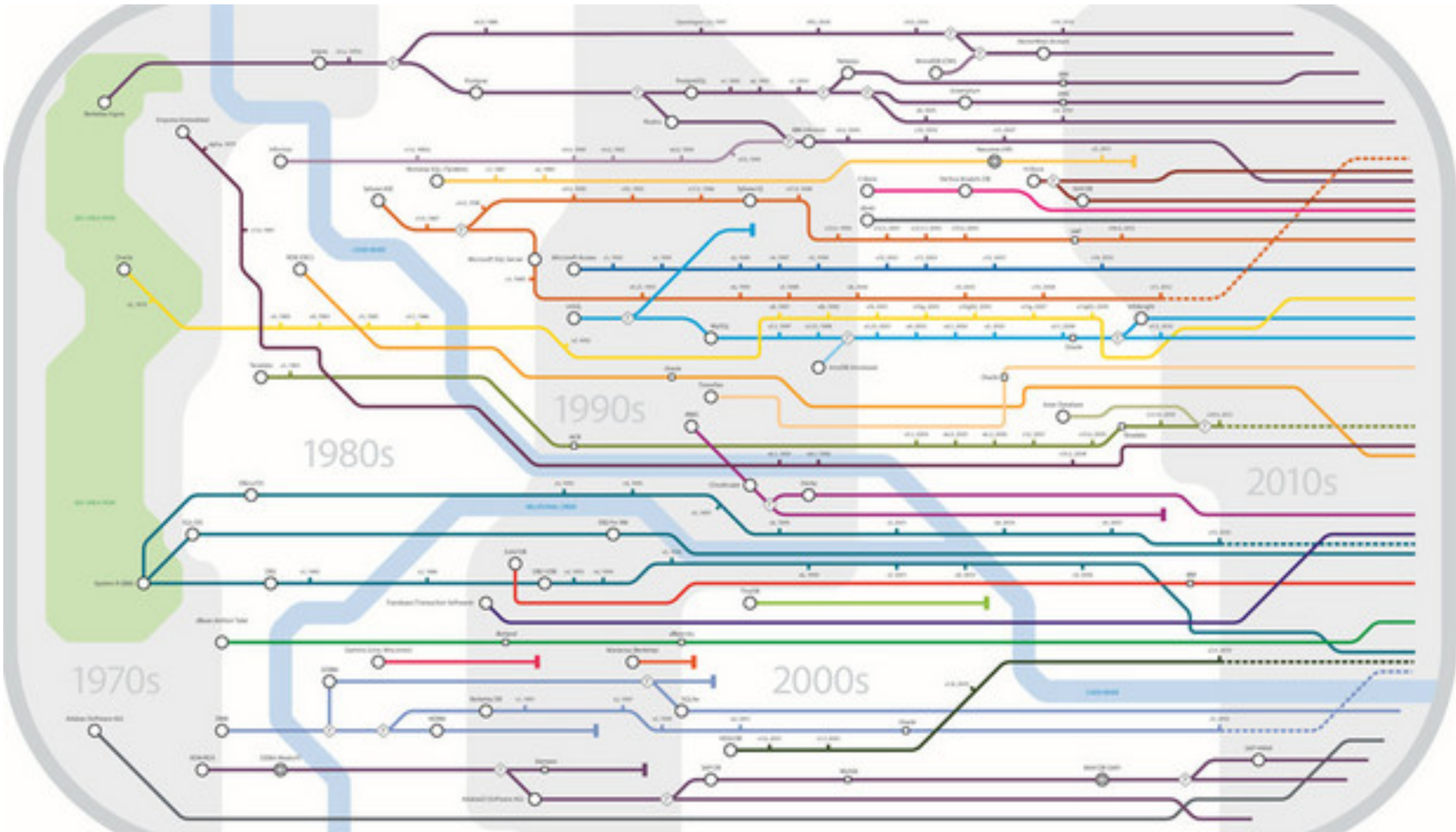
FORECASTING

REPLENISHMENT

<http://www.predictix.com/>

**Too many technologies.
Too little time.**

Genealogy of RDBMSs



[<http://www.searchdatacenter.de/themenbereiche/business-applications/ressourcen/articles/367517/>]

Schaubild: Die Genealogie relationaler Datenbank Management Systeme vom Hasso Plattner Institut, Potsdam.

© 2012, I01companies & Software Languages Team (University of Koblenz-Landau)

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[http://en.wikipedia.org/wiki/Category:Free_database_management_systems] 12 Sep 2012

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[<http://en.wikipedia.org/wiki/Category:NoSQL>] 12 Sep 2012

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[http://en.wikipedia.org/wiki/Category:Cloud_infrastructure] 12 Sep 2012

Guiding questions

- How to do a course on data technologies?
- What data technologies to select?
- What characteristics to exercise?

Background check regarding audience

- Are you a (near-to) ‘developer’?
- Are you a (near-to) ‘DBA’?
- Are you accustomed reading **code** (in Java, ...)?
- Are you accustomed reading **schemas & queries**?
- Do you want to try out things during the course?
- Any expectations that you want make heard now?

**So then,
how to do a course
on data technologies?**

Focus on '**modern**' data technologies!

- **LINQ**: Language INtegrated Queries
- **NoSQL**: One representative per NoSQL DB type
- **MapReduce**-style data processing
- Distributed file systems

In computing, **NoSQL** (mostly interpreted as "not only SQL"[...]) is a broad class of database management systems identified by its non-adherence to the widely used relational database management system model; that is, NoSQL databases are not primarily built on tables, and as a result, generally do not use SQL for data manipulation.

[<http://en.wikipedia.org/wiki/NoSQL>] 12 Sep 2012

Characteristics of a NoSQL database

- It does not use SQL as its query language.
- It may not give full ACID guarantees.
- It has a distributed, fault-tolerant architecture.
- It is highly optimized and specialized.
- It is highly scalable (horizontally).

[<http://en.wikipedia.org/wiki/NoSQL>] 12 Sep 2012

Course picks | representative per NoSQL DB type

- Works with the typical scenarios
- Best-in class community buzz / user adoption
- Strong community ecosystem
- Free
- List of systems
 - Key-value databases (Riak)
 - Document-oriented databases (MongoDB)
 - Graph databases (Neo4J)
 - Column-oriented databases (HBase)

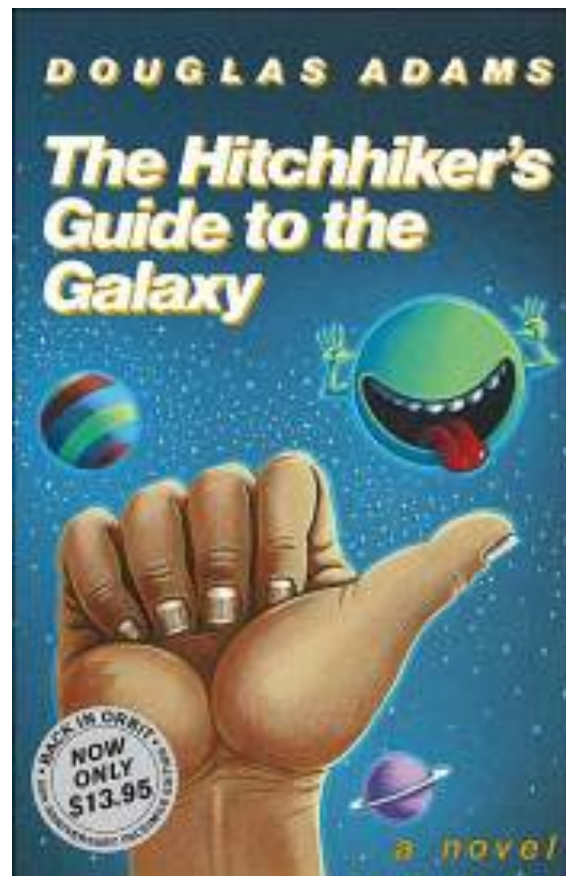
MapReduce is a [programming model](#) for processing large data sets, and the name of an implementation of the model by [Google](#). MapReduce is typically used to do [distributed computing](#) on [clusters](#) of computers. [...] The model is inspired by the [map](#) and [reduce](#) functions commonly used in [functional programming](#), [...]. MapReduce [libraries](#) have been written in many programming languages. A popular [free](#) implementation is [Apache Hadoop](#).

[<http://en.wikipedia.org/wiki/MapReduce>] 12 Sep 2012

Use **101 companies** throughout the course!

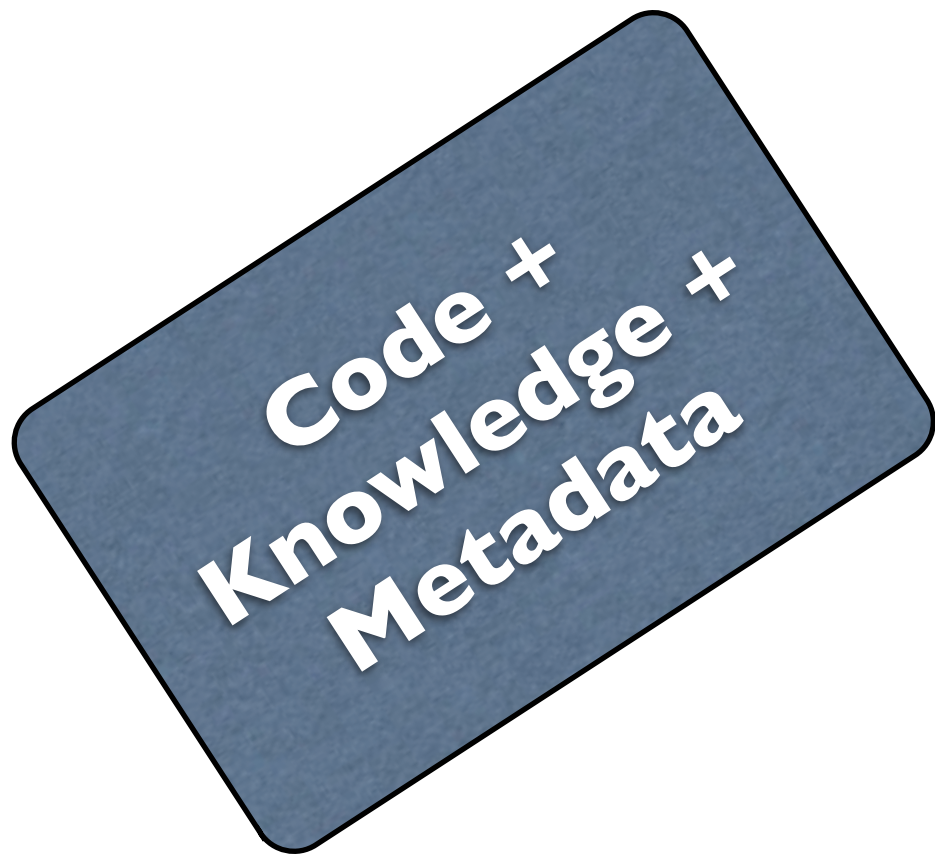
<http://101companies.org>

The Hitchhiker's Guide to the **Software** Galaxy



Wannabe Wikipedia for Software Developers. :-)

What's IOI companies?



A **community project** aiming at a **knowledge base** about software **technologies and languages** based on implementations of a human-resources management system.

Why is it called “101 companies”?

Company X:
Swing + JDBC

Company Y:
SWT + Hibernate

Company Z:
GWT + MongoDB

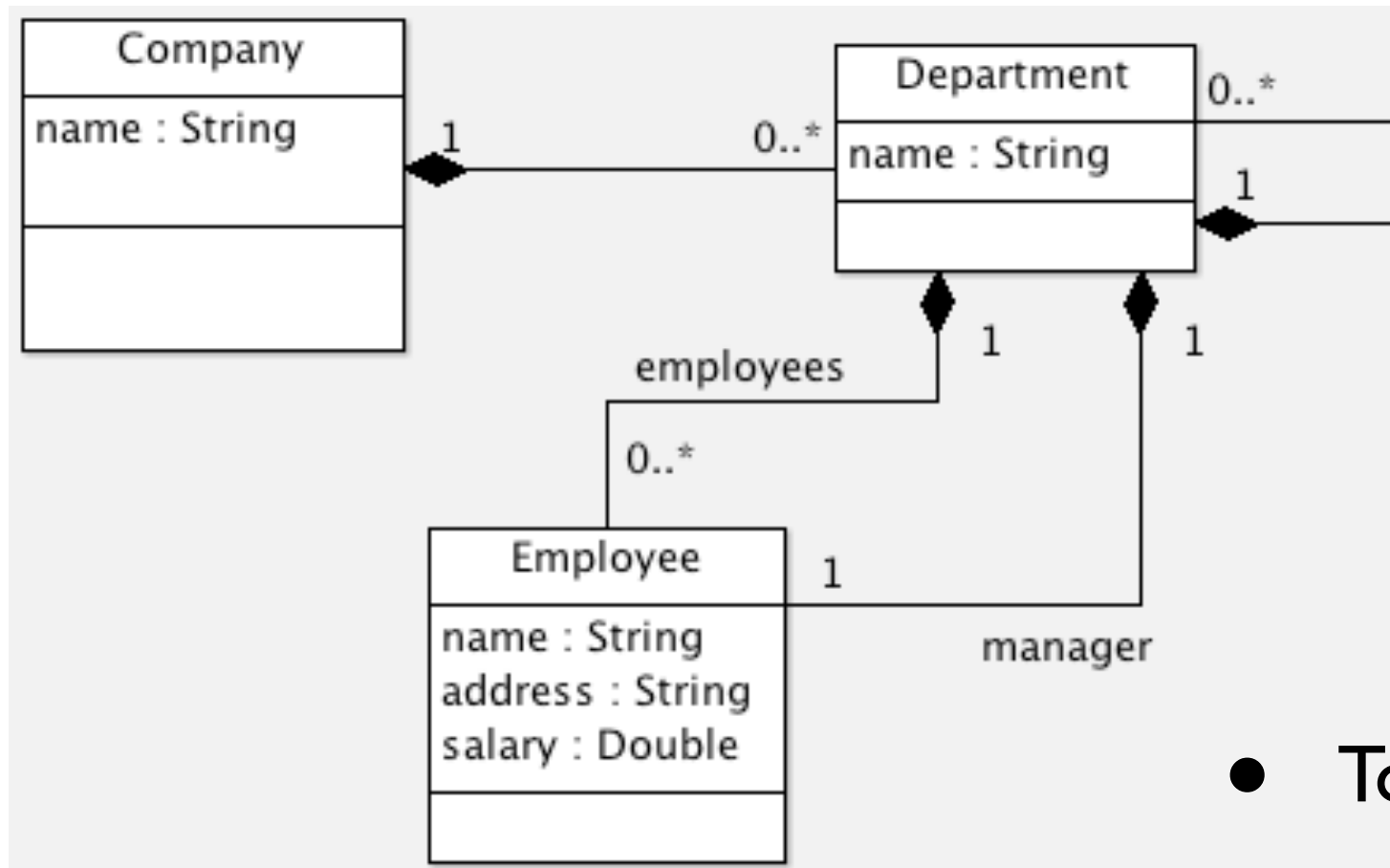
...

“101 ways of building a HRMS.”

or

“Building a HRMS for 101 companies.”

A Human Resources Management System



- Total salaries
- ~~Increase salaries~~
- Cut salaries
- Edit employee data
- Import / export company data

Demo

A *I0I companies* implementation
using **HTML5** and local storage

company.html

file:///localhost/Users/laemmel/projects/101repo/contributions/html5local/company.html

101Companies HTML5 implementation with local storage

Company

Name:

Departments:

Total:

Load company from local storage

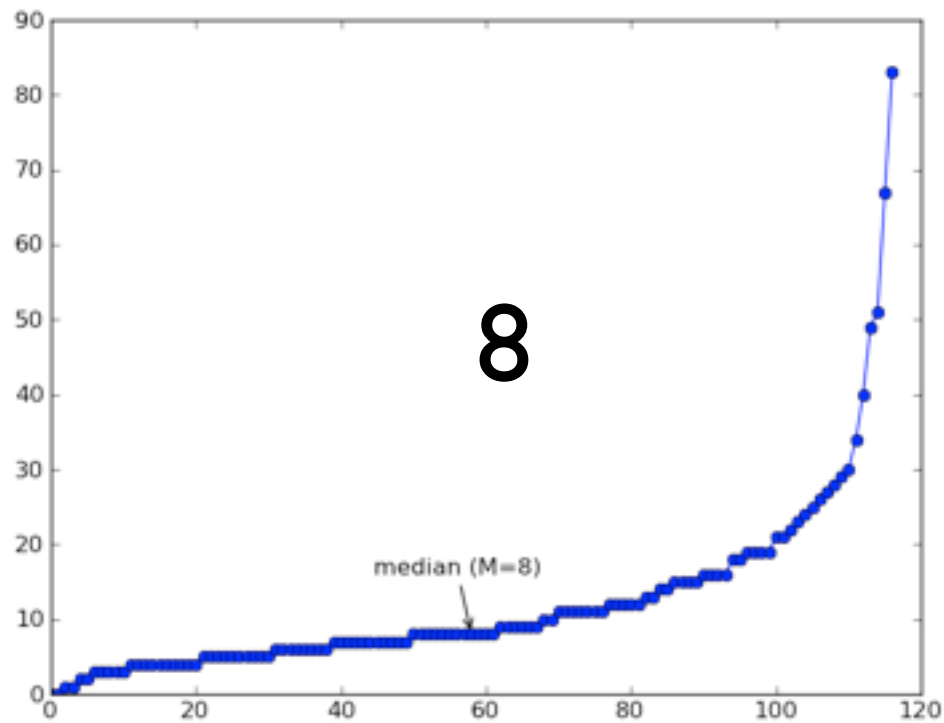
```
JSON.parse(localStorage.getItem('company'))
```

Save company to local storage

```
localStorage.setItem('company', JSON.stringify(company))
```

[contributions/html5local/company.js]

The 101 companies **Repository**



#Files per implementation

Technologies

Languages

LOC per implementation

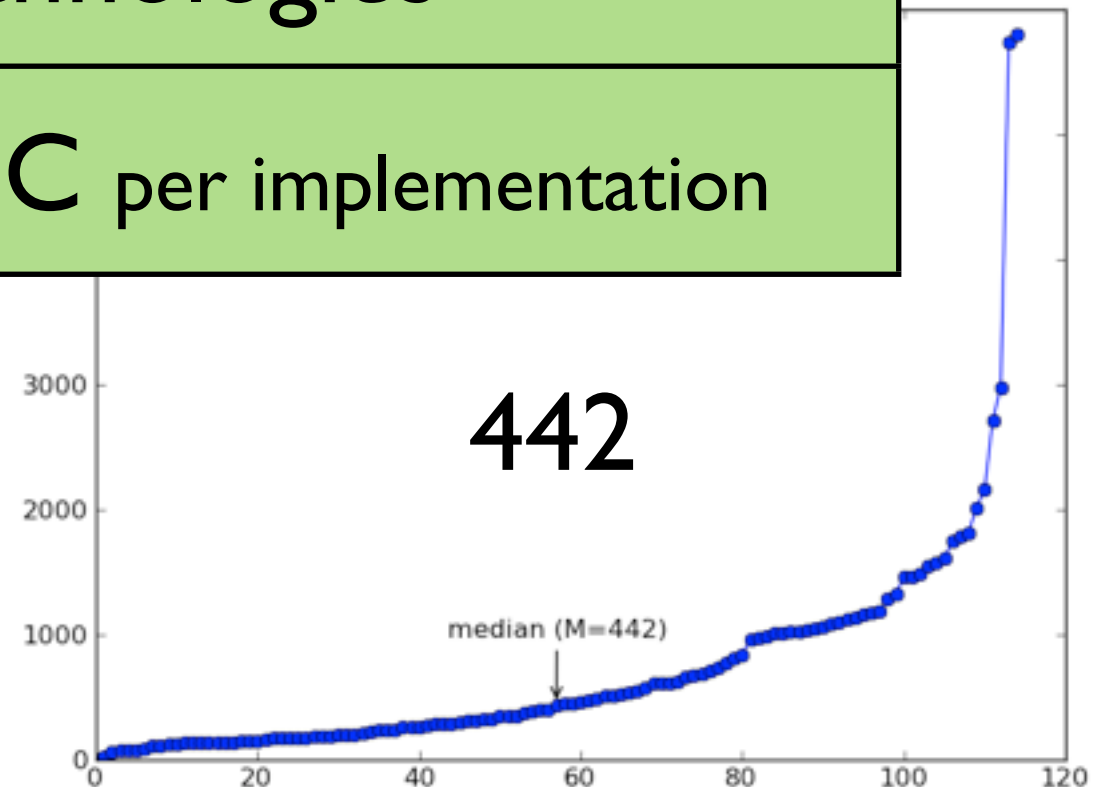


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- Introduction *42min*
- Warmup for data technologies *42min*
- MapReduce-style data processing *42min*
 - Conceptual description
 - Application to Apache Hadoop
- Basics of NoSQL *42min*
- 4 representative NoSQL databases *4 * 35.5min = 142min*
 - Motivation and characteristics
 - Demonstration of MapReduce style
 - I0I companies-based demonstration of database systems
- NoSQL use cases *>= 0min*

**Thanks for your interest.
Questions? Comments?**