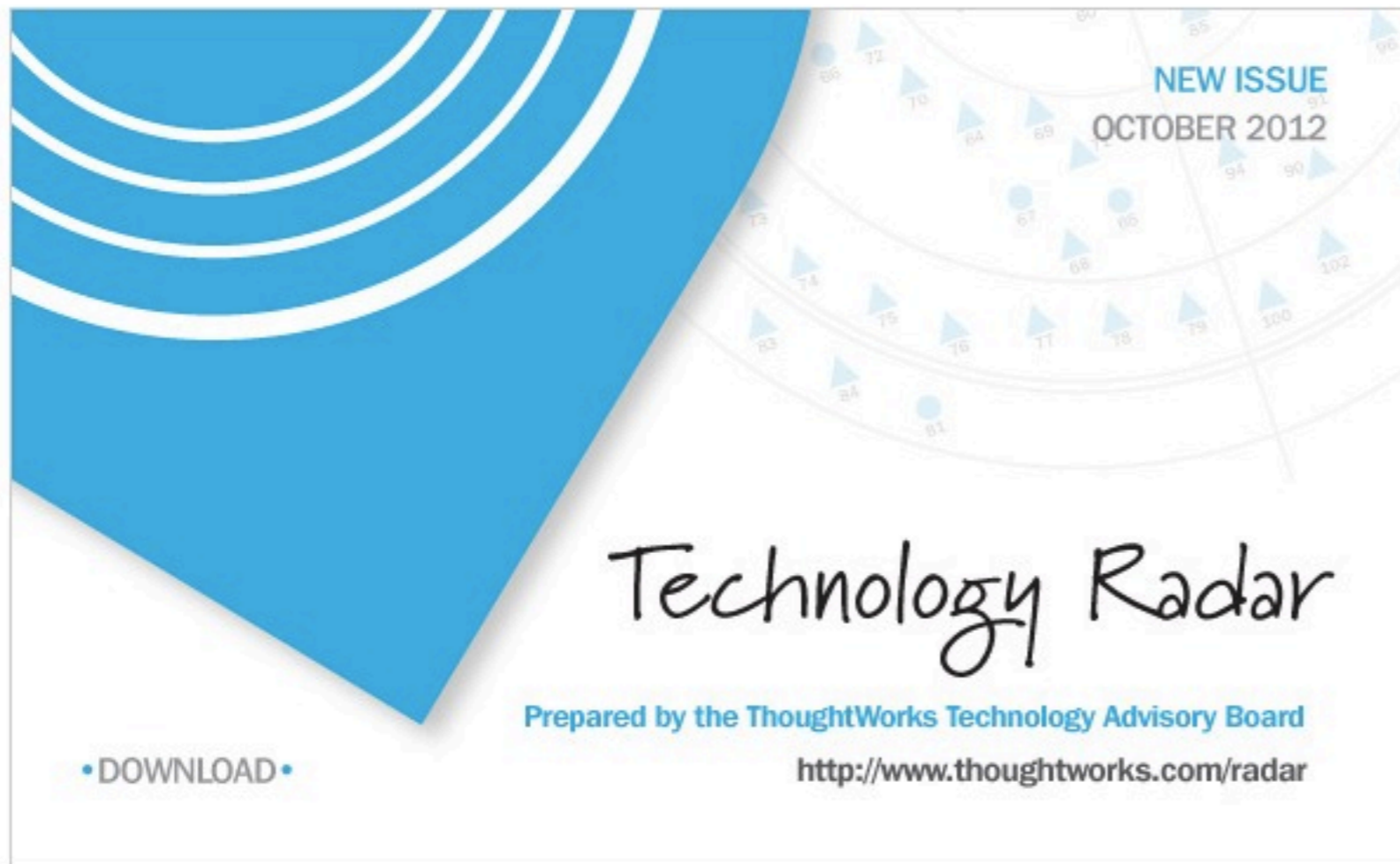




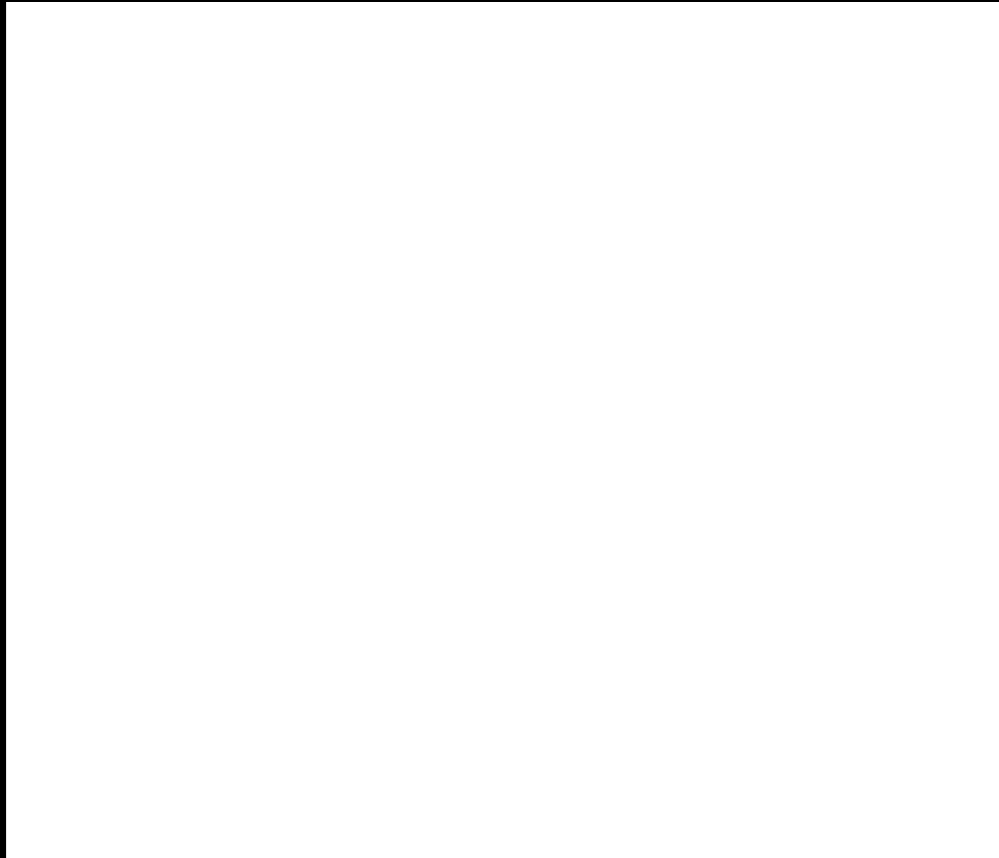
# From Macro To Micro

Sam Newman  
ThoughtWorks



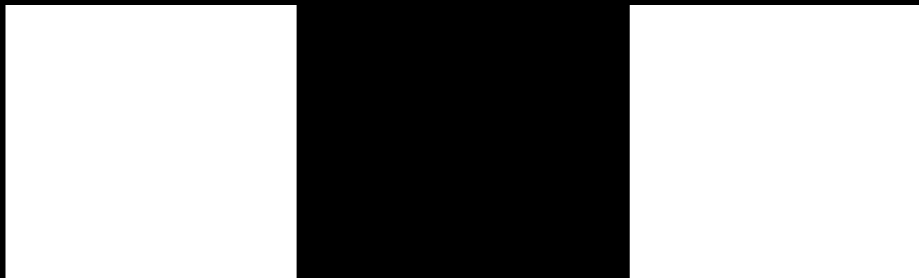
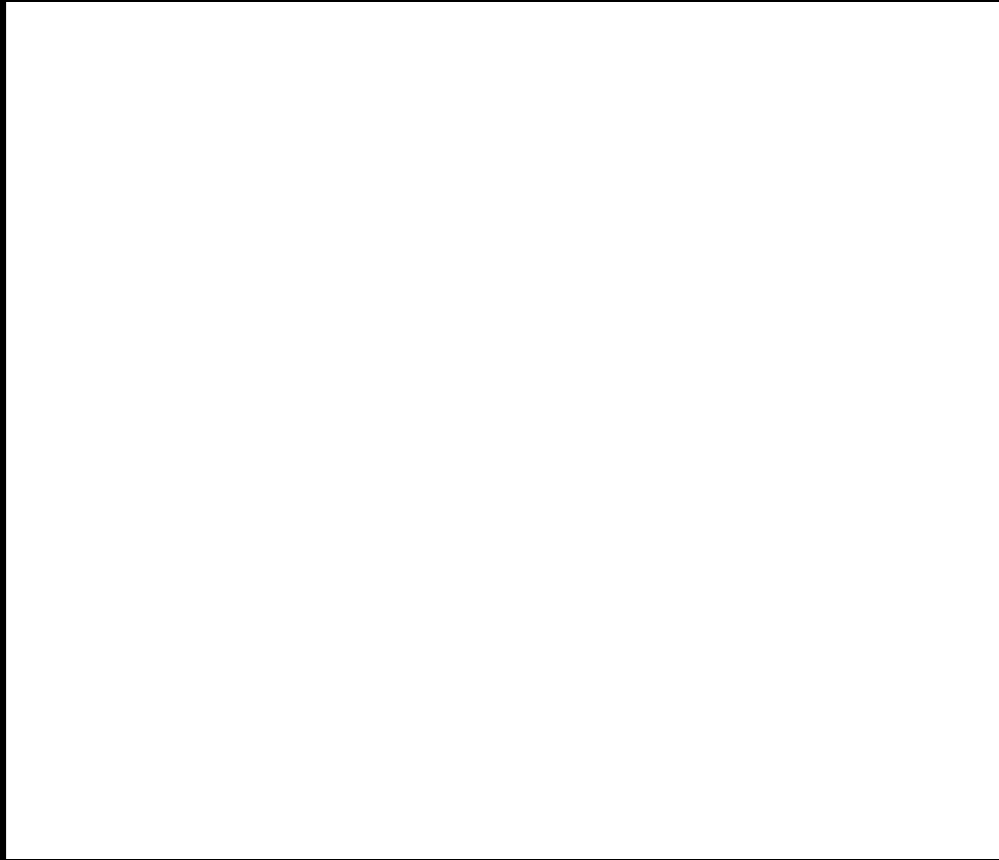
The ThoughtWorks Technology Advisory Board is a group of technology leaders from across ThoughtWorks. They produce our Technology Radar to help decision makers, as well as practitioners, understand emerging technologies and trends that affect the market today.

[Read latest](#)



#gotoaar

@samnewman



#gotoaar

@samnewman

# Durability

#gotoaar

@samnewman

# Technology

#gotoaar

@samnewman

# Geography

#gotoaar

@samnewman

# Team Structure & Organisation

#gotoaar

@samnewman



# Speed Of Change

#gotoaar

@samnewman

vimeo

Join

Log In

Create

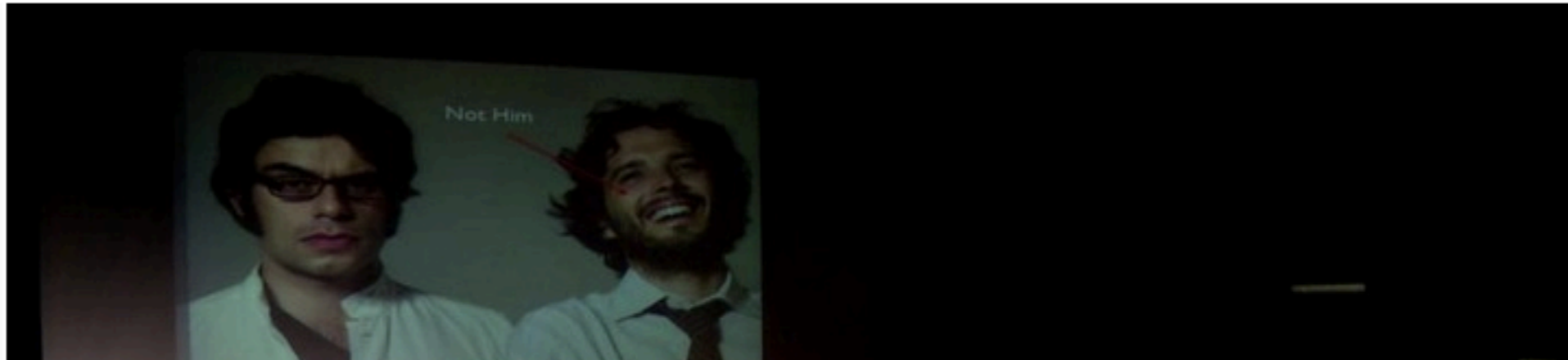
Watch

Upload

Search



HIDE VIDEOS



<http://bit.ly/GeeCon2012SamN>



## GeeCON 2012 - Sam Newman - Designing For Rapid Release

from GeeCON Conference **PLUS** 9 months ago / NOT YET RATED

#gotoaar

@samnewman

What makes a good  
service?

#gotoaar

@samnewman

# High Cohesion

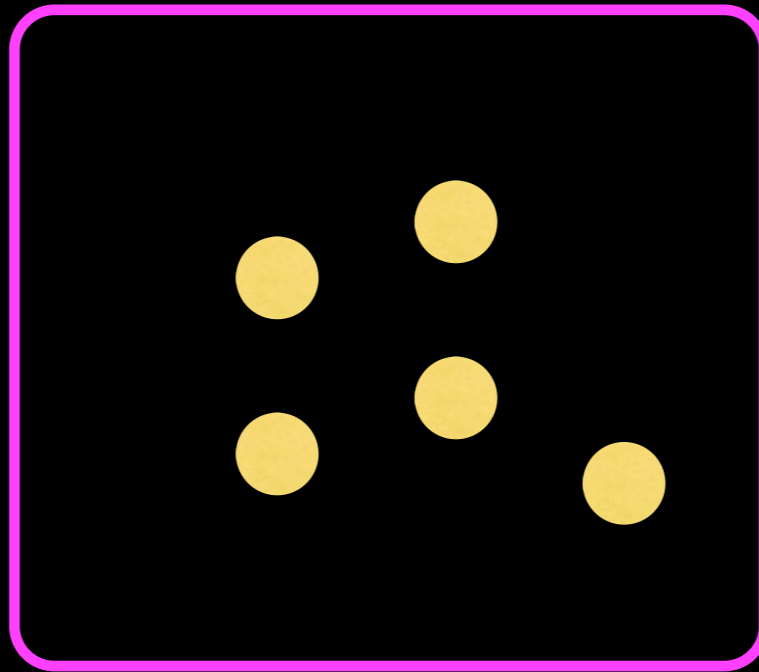
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@samnewman

# Loose Coupling

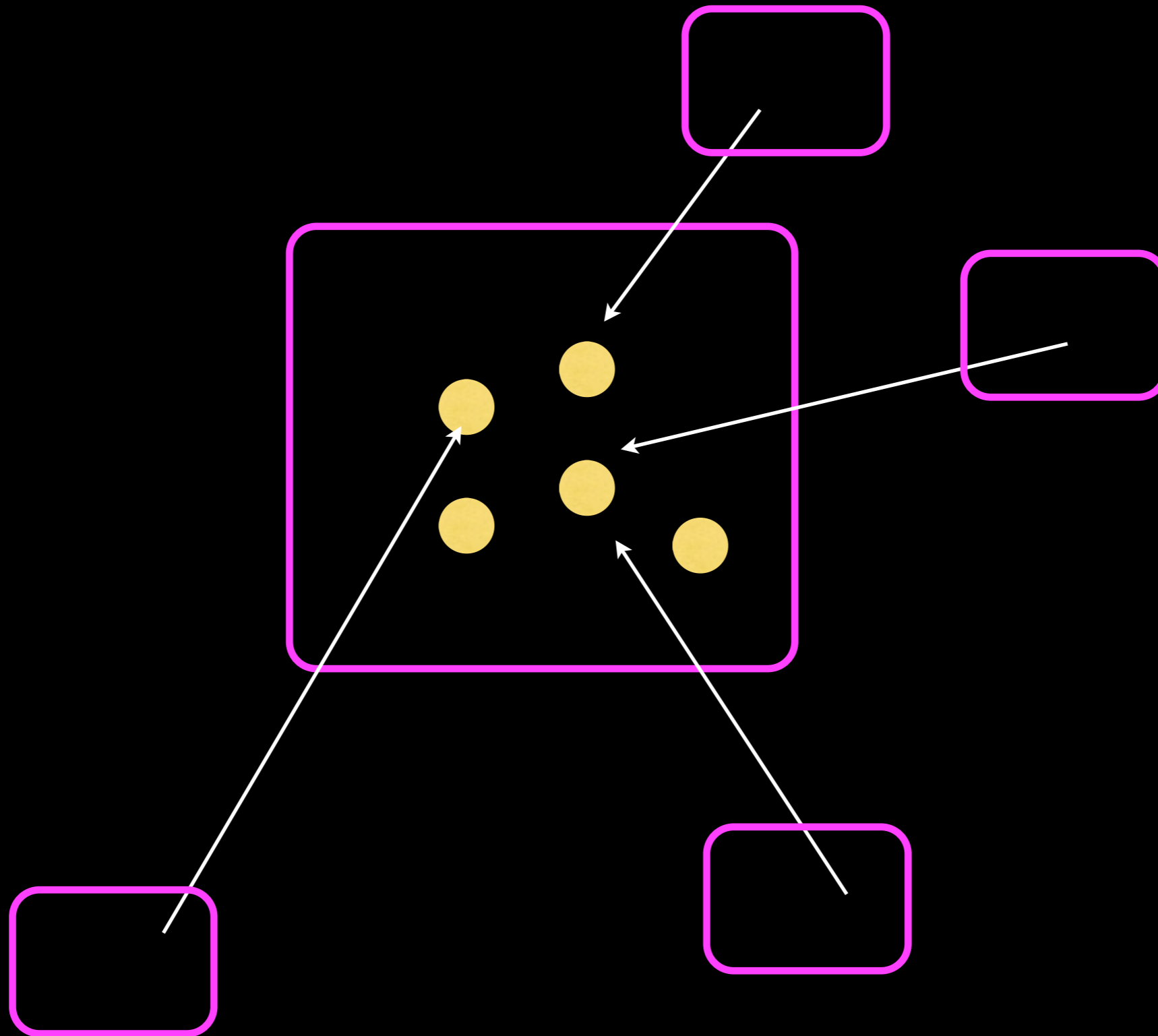
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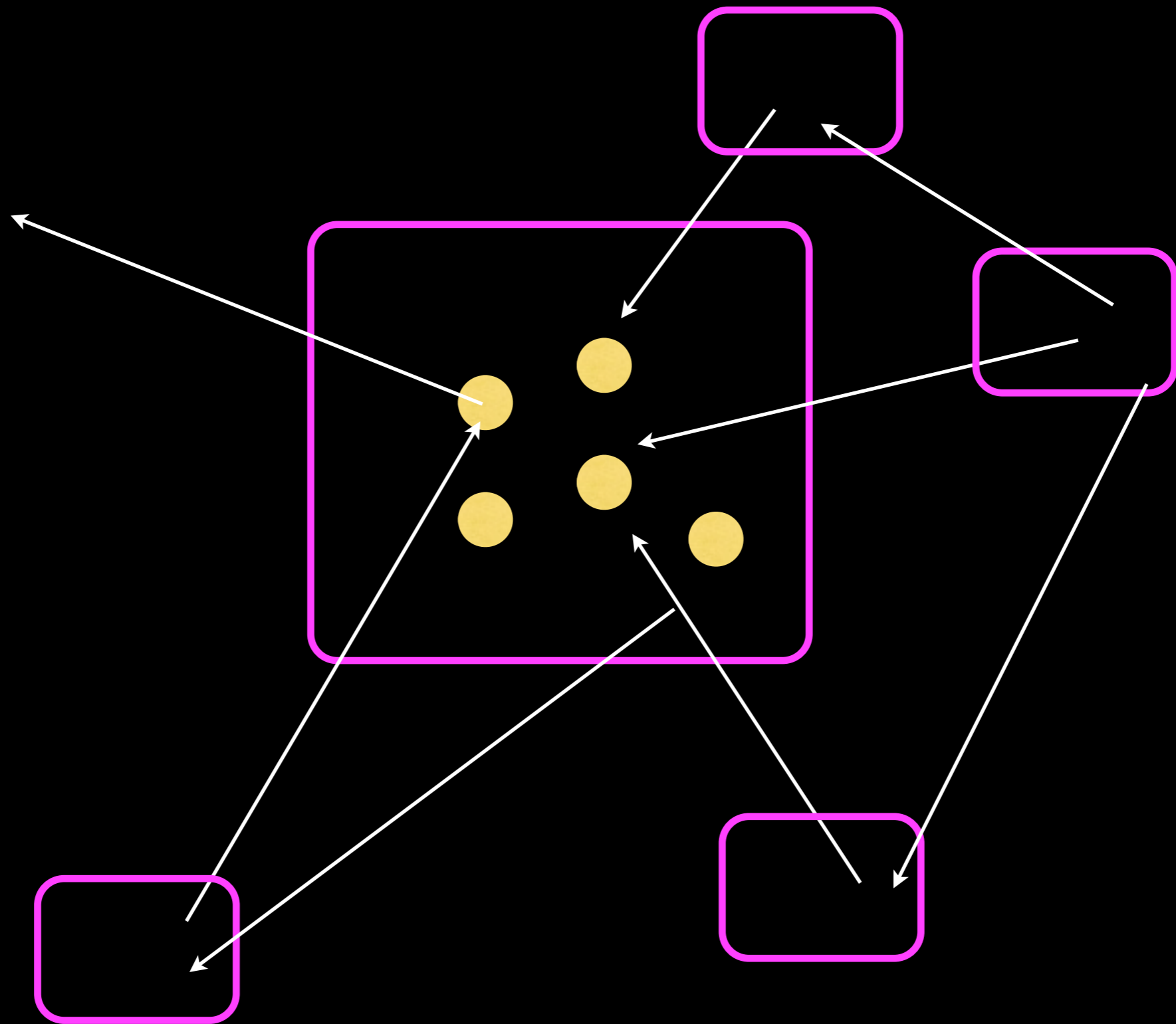
@samnewman



#gotoaar

@samnewman

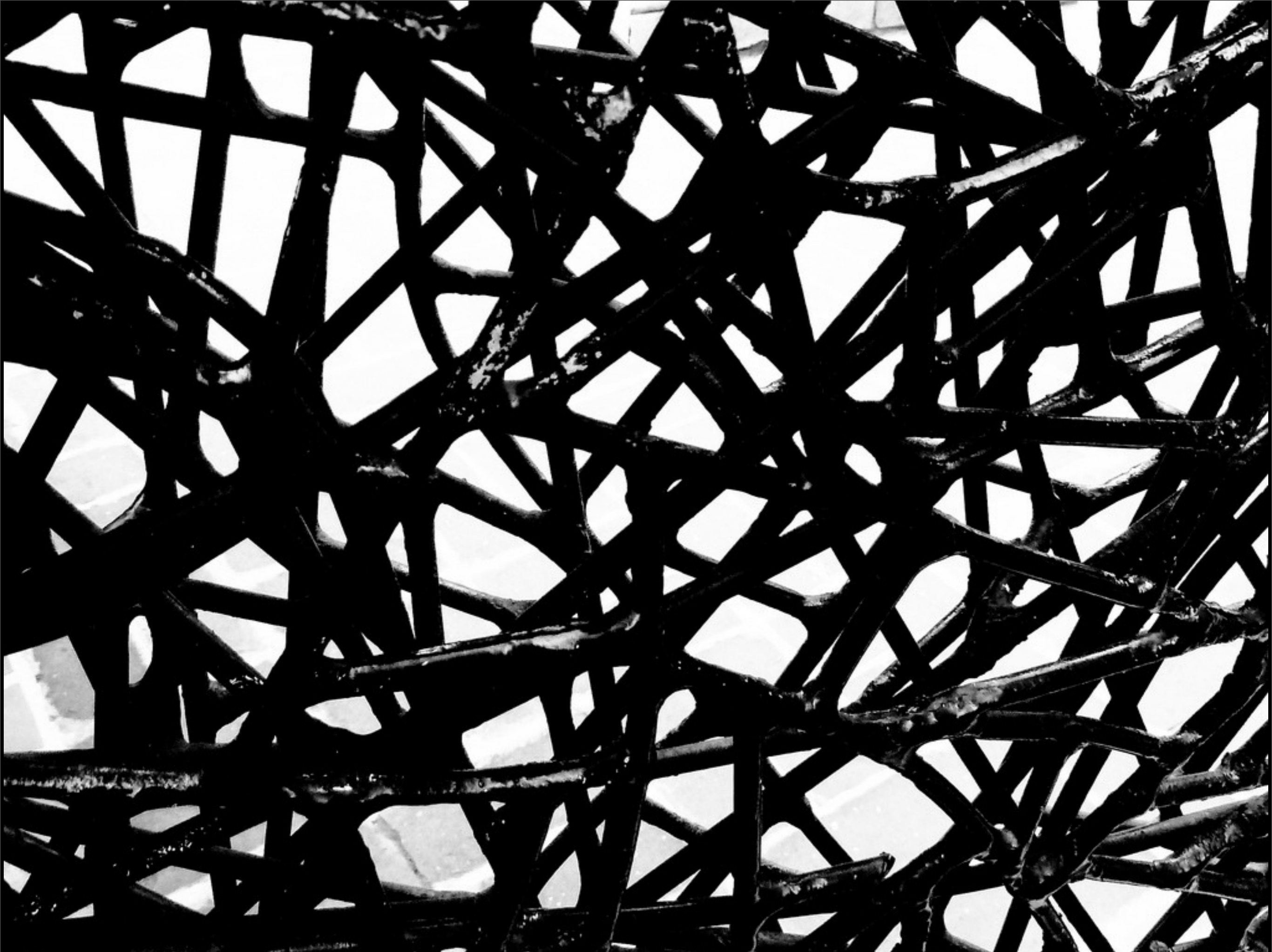




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@samnewman



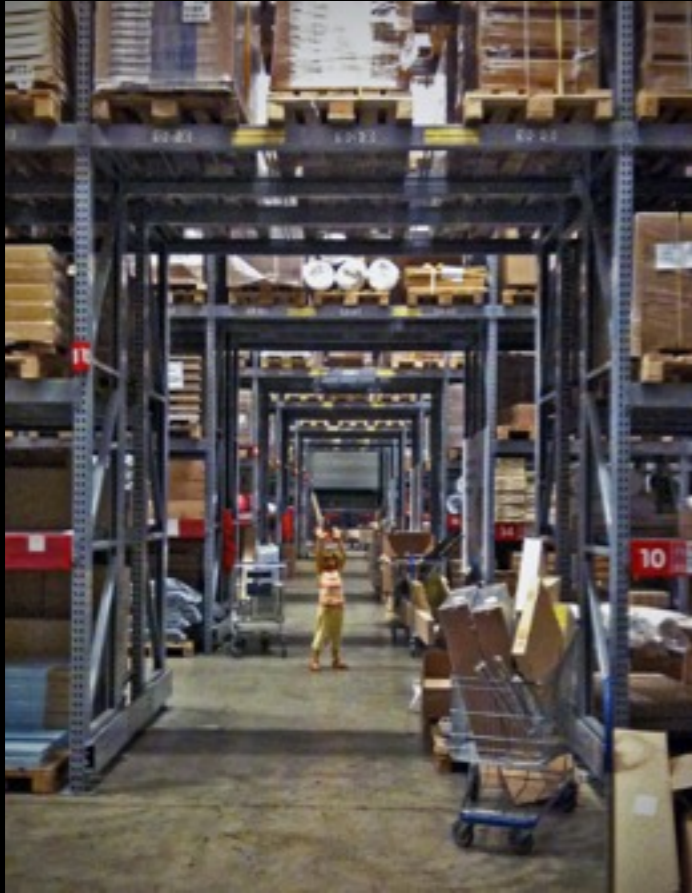


Monday, 30 September 13



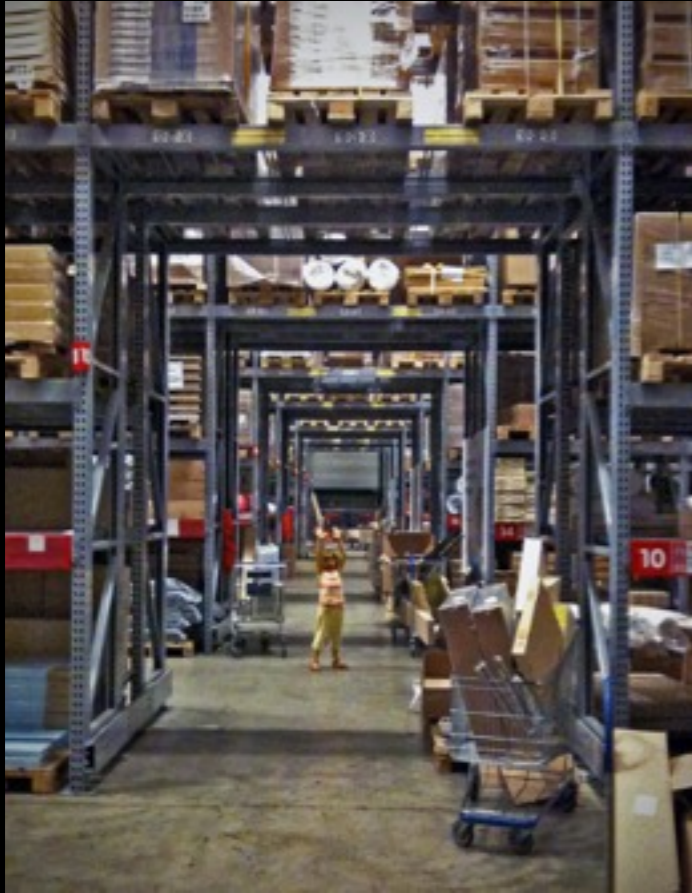
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@samnewman



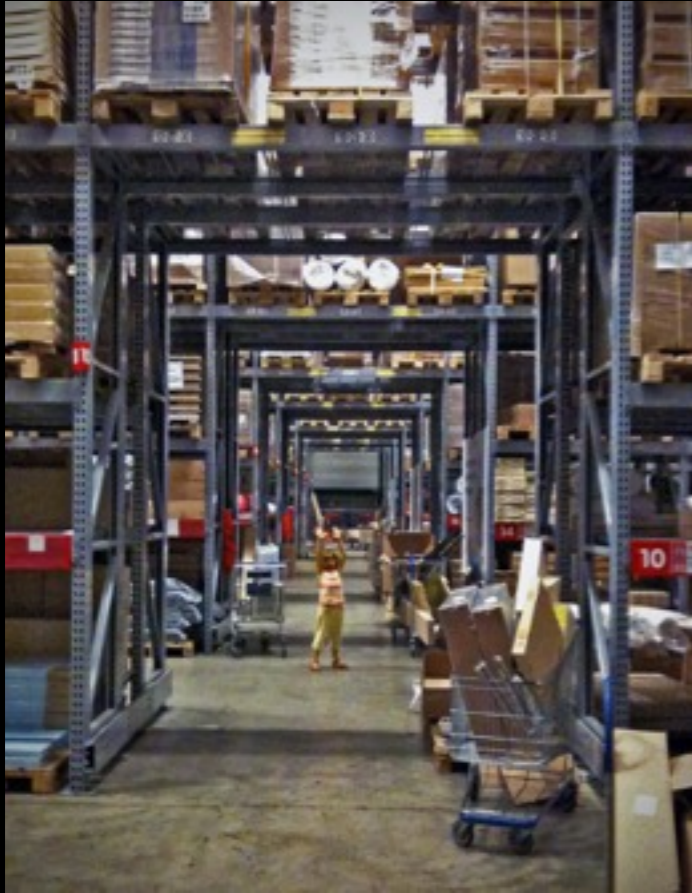
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@samnewman



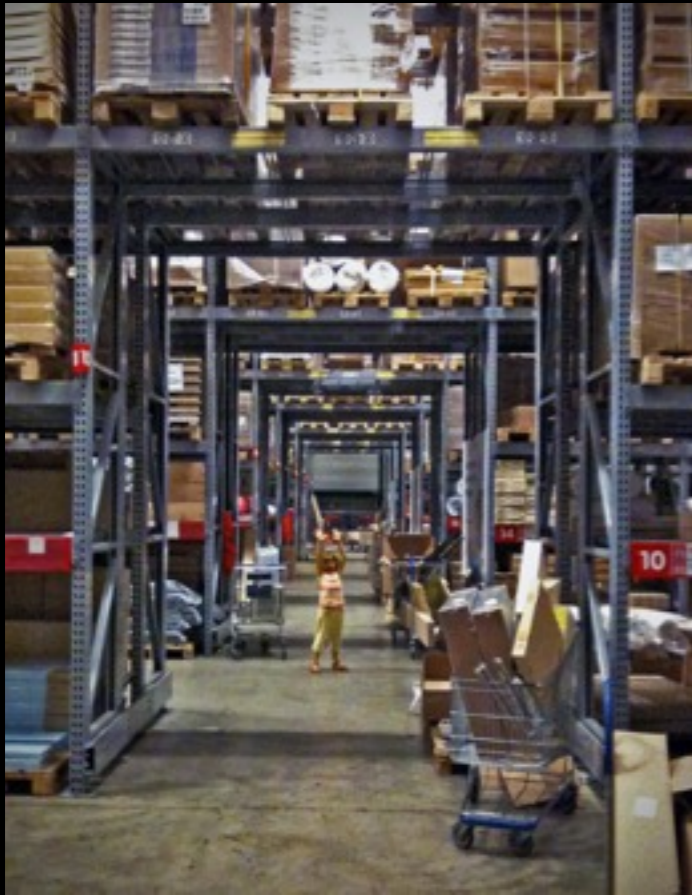
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@samnewman



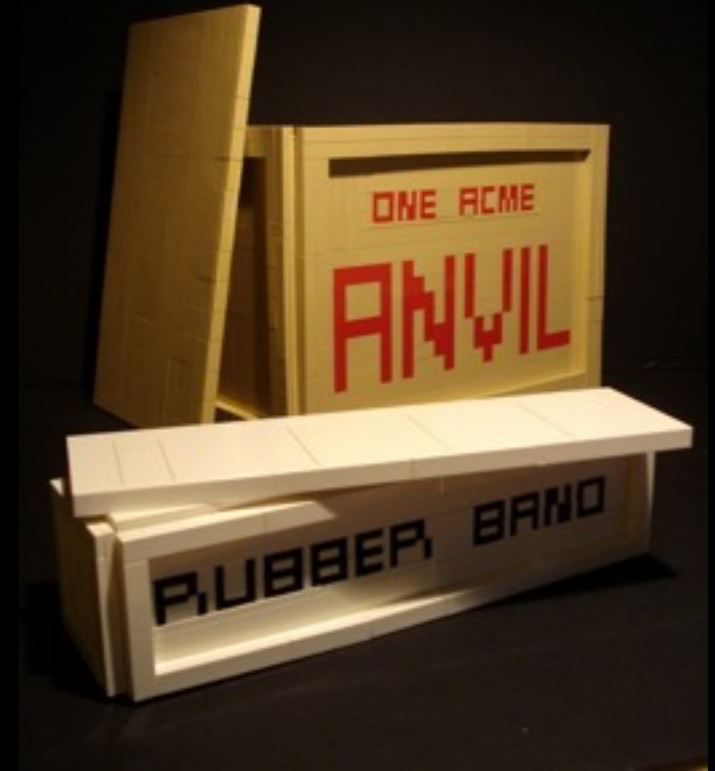
#gotoaar

@samnewman



#gotoaar

@samnewman



#gotoaar

@samnewman

Domain-Driven

DESIGN

Tackling Complexity in the Heart of Software



Eric Evans  
Foreword by Martin Fowler



# Bounded Context

#gotoaar

@samnewman

"The delimited applicability of a particular model. **BOUNDING CONTEXTS** gives team members a clear and shared understanding of what has to be consistent and what can develop independently."

A specific responsibility  
enforced by explicit  
boundaries

<http://www.sapiensworks.com/blog/post/2012/04/17/DDD-The-Bounded-Context-Explained.aspx>

#gotoaar

@samnewman



#gotoaar

@samnewman

Add to cart

#gotoaar

@samnewman

Add to cart

Checkout

#gotoaar

@samnewman

Add to cart

View Latest  
Releases

Checkout



Search

Add to cart

View Latest  
Releases

Checkout

Search

Add to cart

View Latest  
Releases

Checkout

Listen To Previews

Checkout

Add to cart

Search

View Latest  
Releases

Listen To Previews

Shopping Cart

Catalog

Music Library

Products

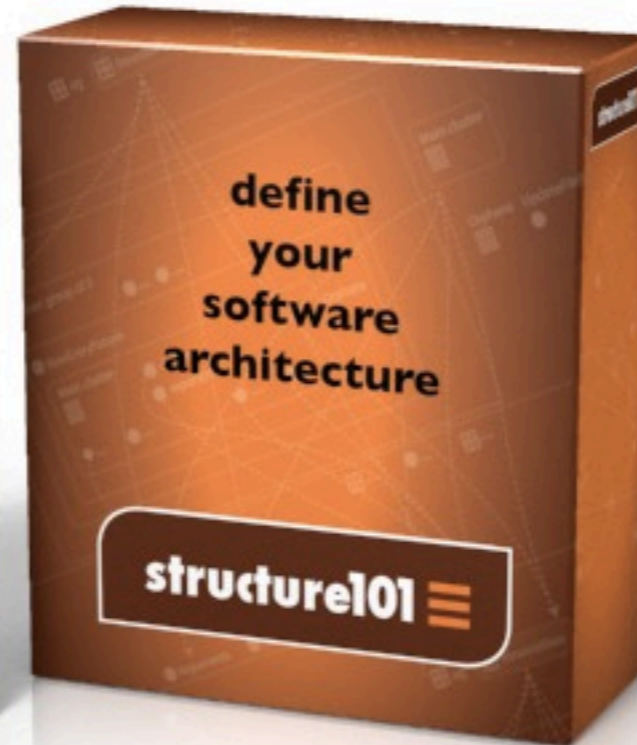
Refactor

Define

Enforce



restructure101



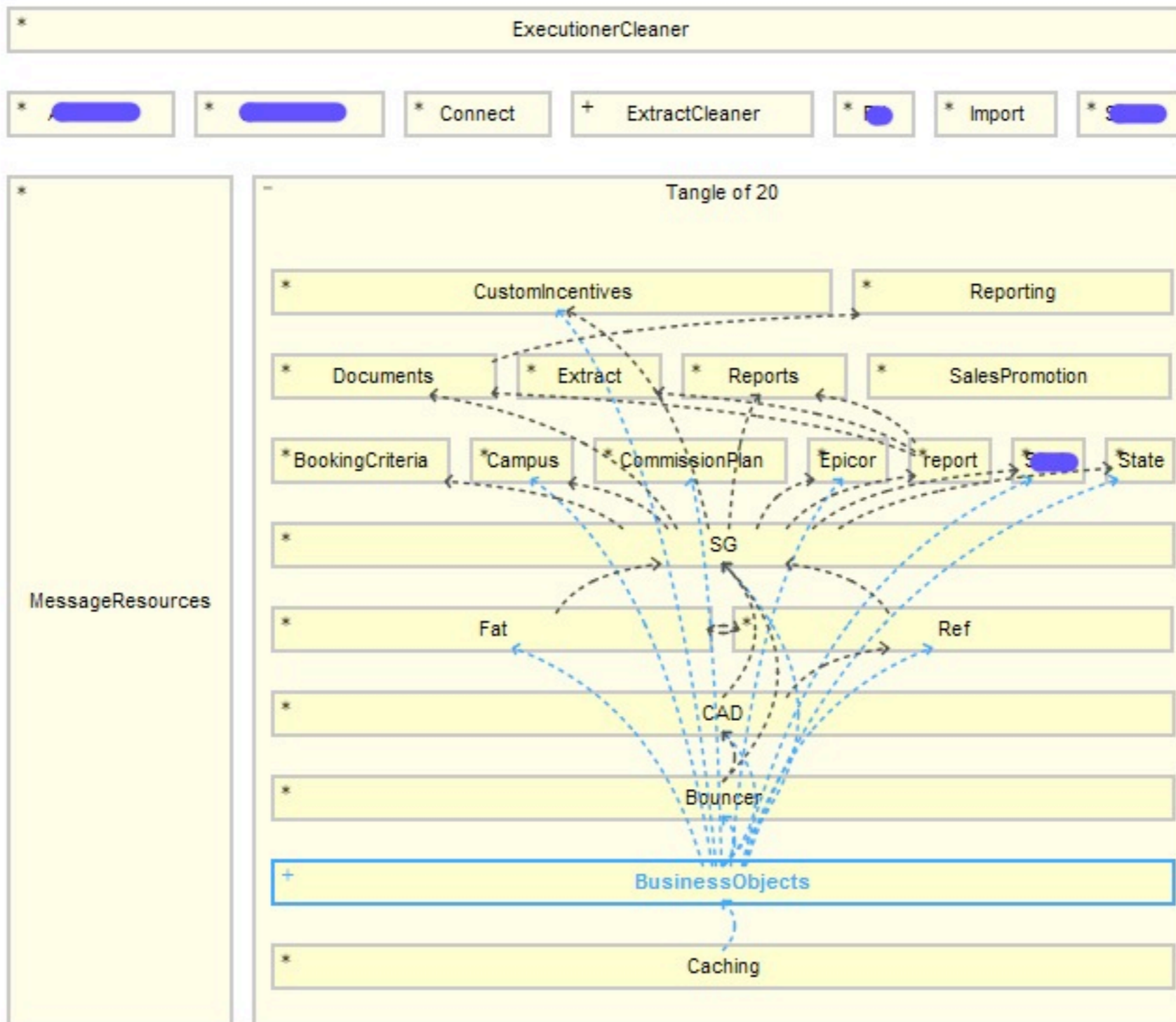
structure101

Define your architecture



structure101build

**Enforce your architecture**  
Enforce architecture rules and complexity constraints through your CI / build environment



# MusikShopMono



#gotoaar

@samnewman

# MusikShopMono

Warehouse

Finance

Catalog

Recommendation



That was the easy bit

#gotoaar

@samnewman

# Enter the DB

#gotoaar

@samnewman

*The Addison-Wesley Signature Series*



# REFACTORING DATABASES

EVOLUTIONARY  
DATABASE DESIGN



SCOTT W. AMBLER  
PRAMOD J. SADALAGE



*Forewords by Martin Fowler, John Graham,  
Sachin Rekhi, and Dr. Paul Dorsey*

#gotoaar

@samnewman

MusikShopMono

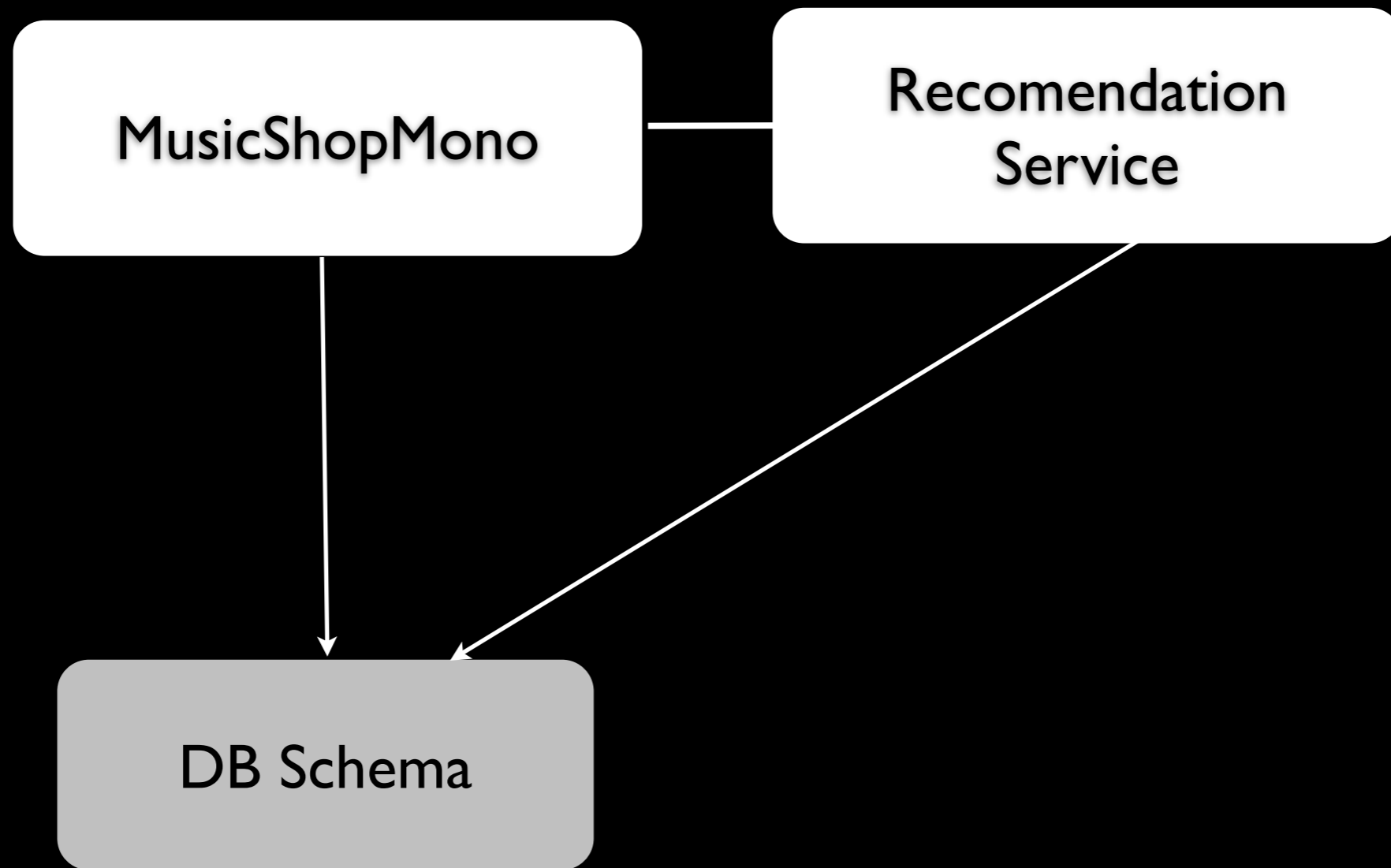


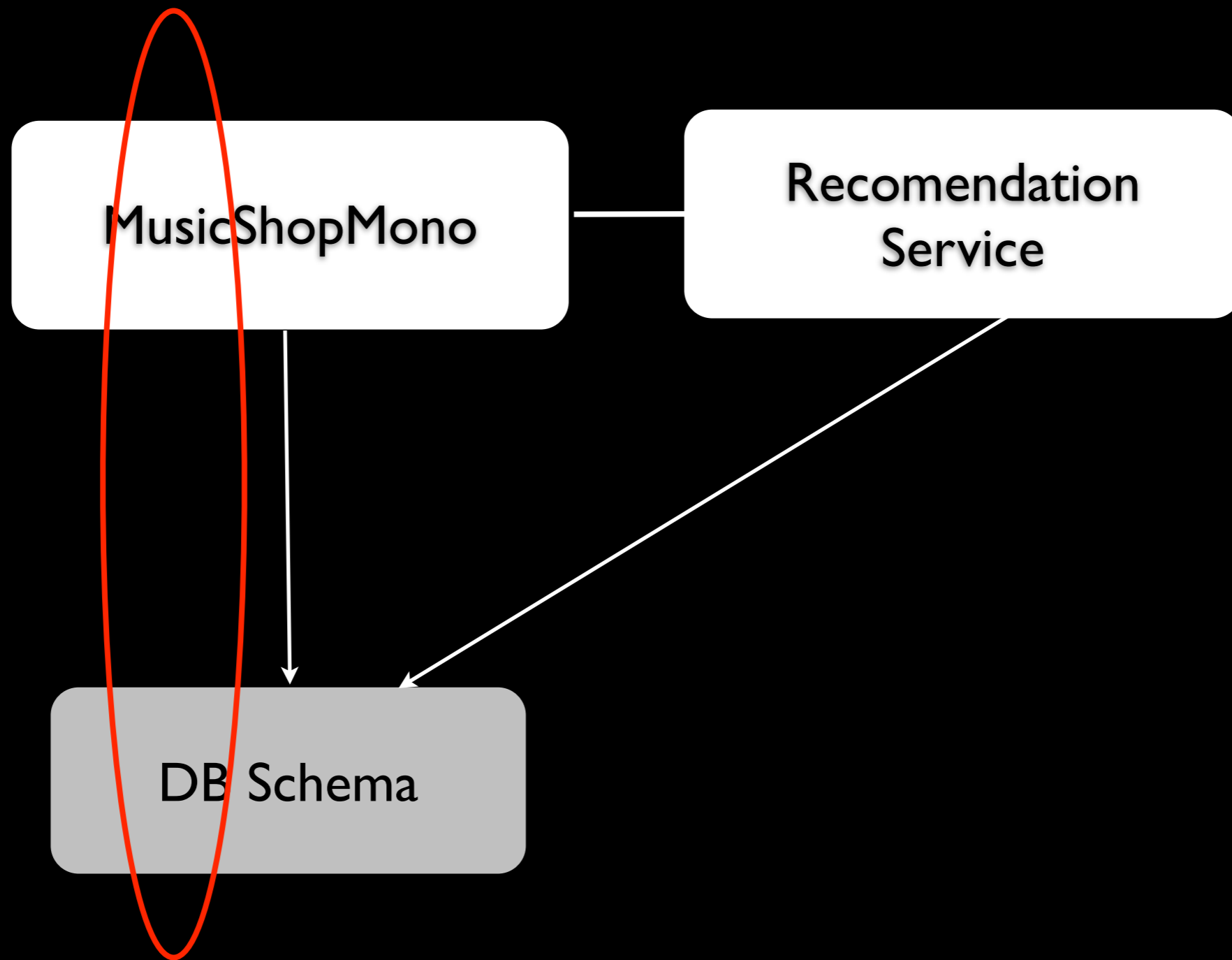
DB

MusicShopMono



DB Schema





# MusikShopMono

Warehouse

Finance

Catalog

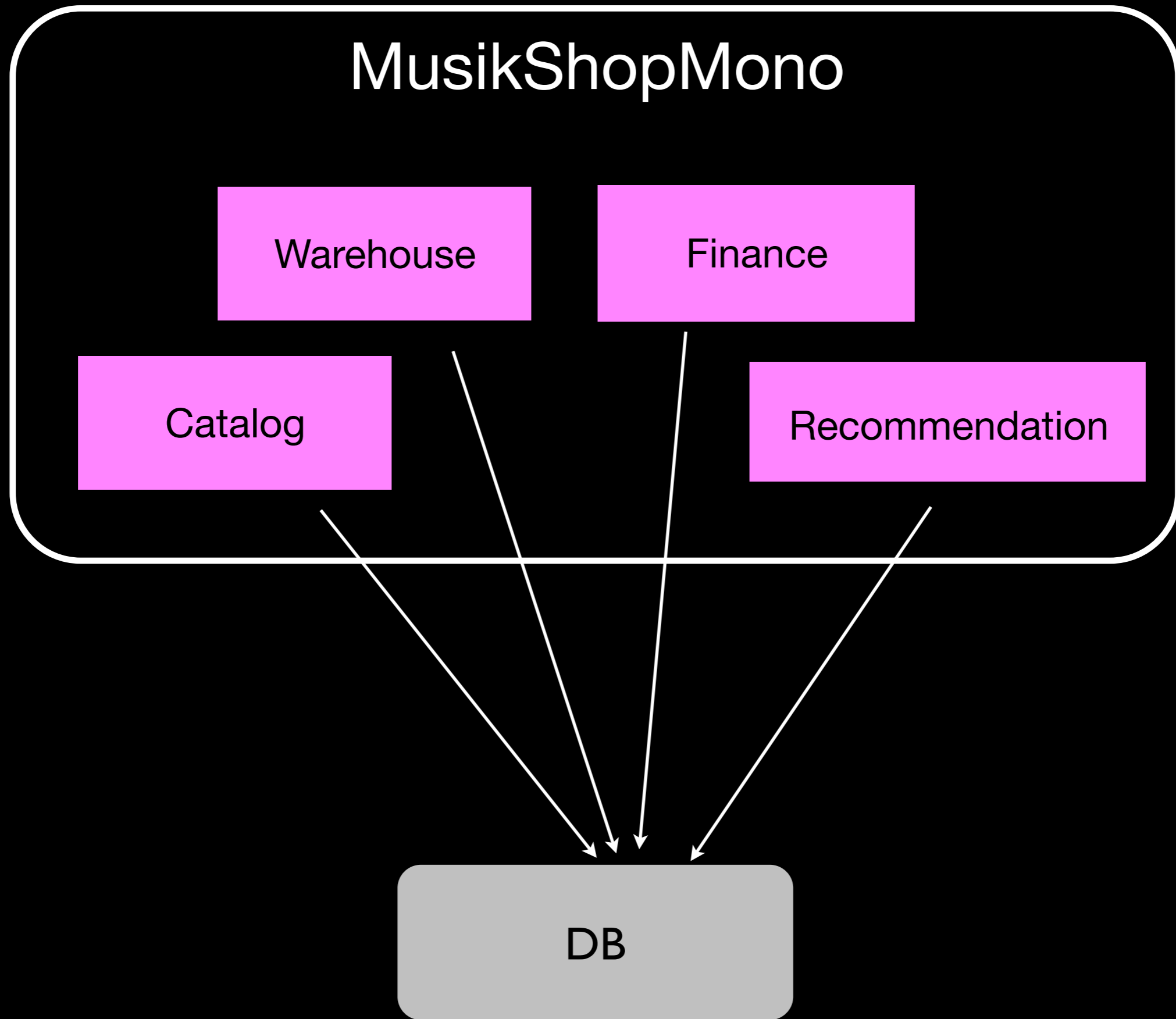
Recommendation

Repository

DB

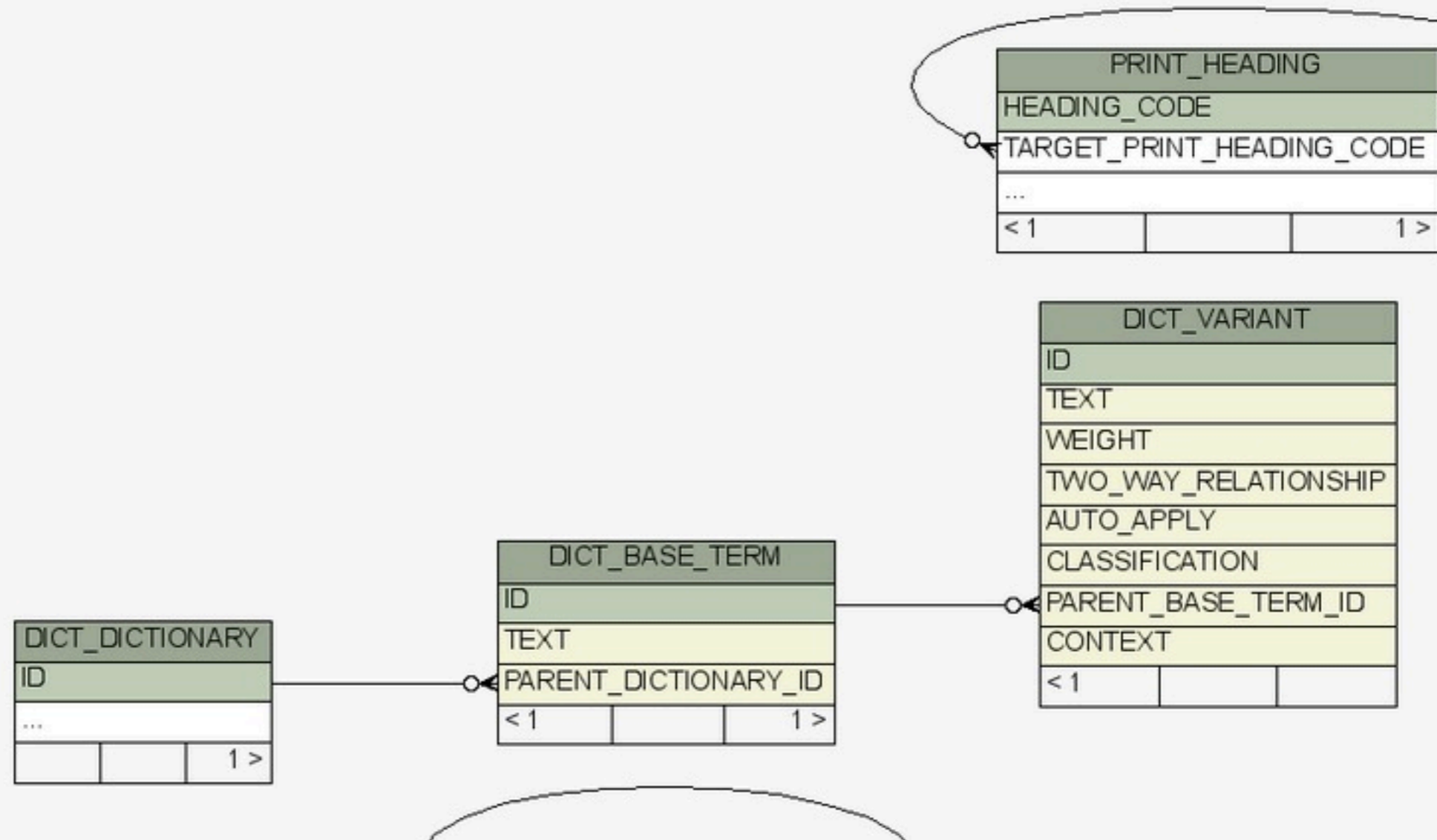


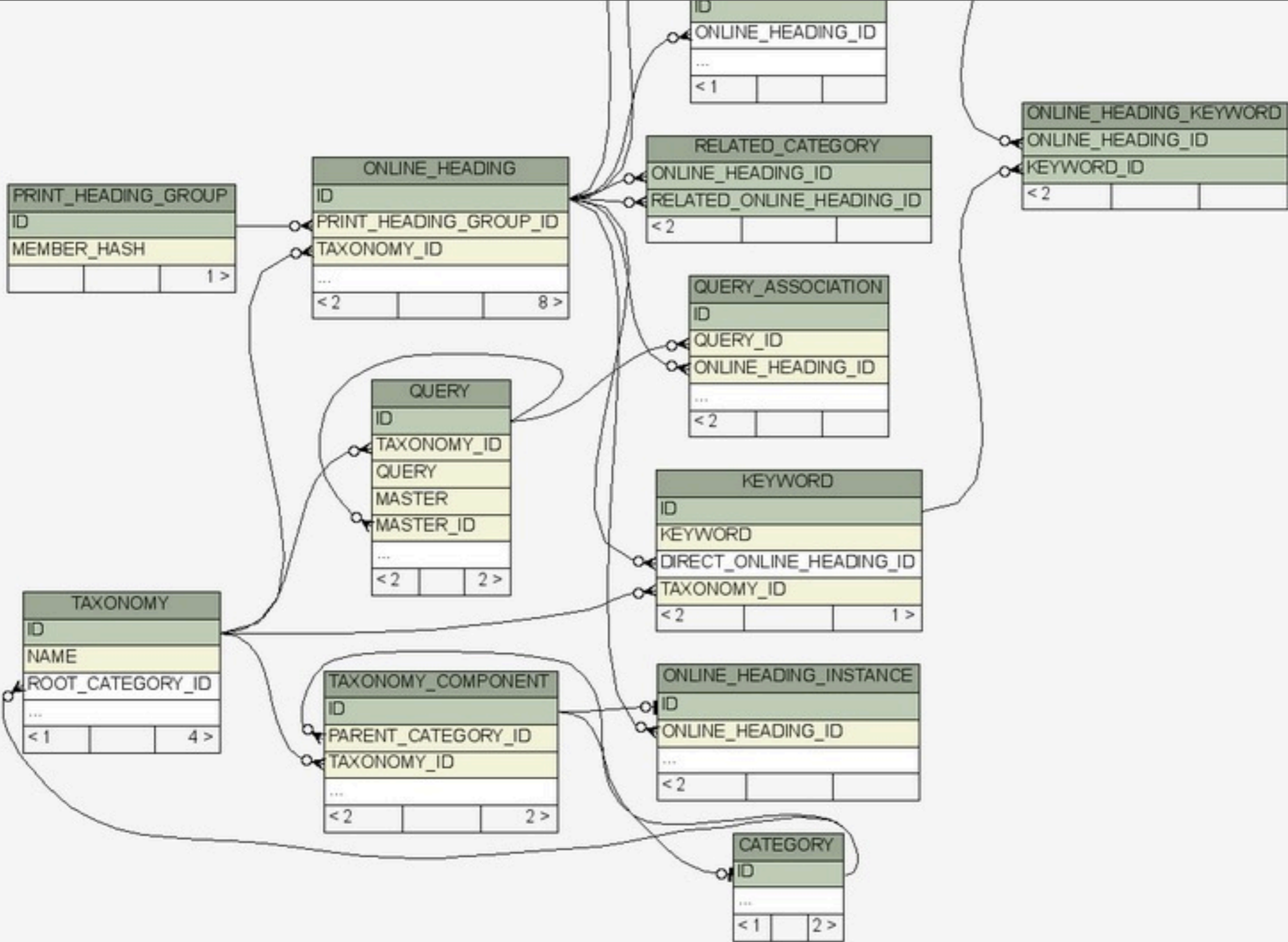
# MusikShopMono



## SchemaSpy Analysis of YPOLD3.CMT\_DYELA - All Relationships

Generated by [SchemaSpy](#) on Fri Jan 21 15:23 EST 2011  
 - All columns





# MusikShopMono

Catalog

# MusikShopMono

Catalog





Line Items

# MusikShopMono

Catalog

Finance





Line Items

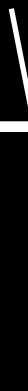
# MusikShopMono

Catalog

Finance




Line Items




Ledger

# MusikShopMono

Catalog

Finance

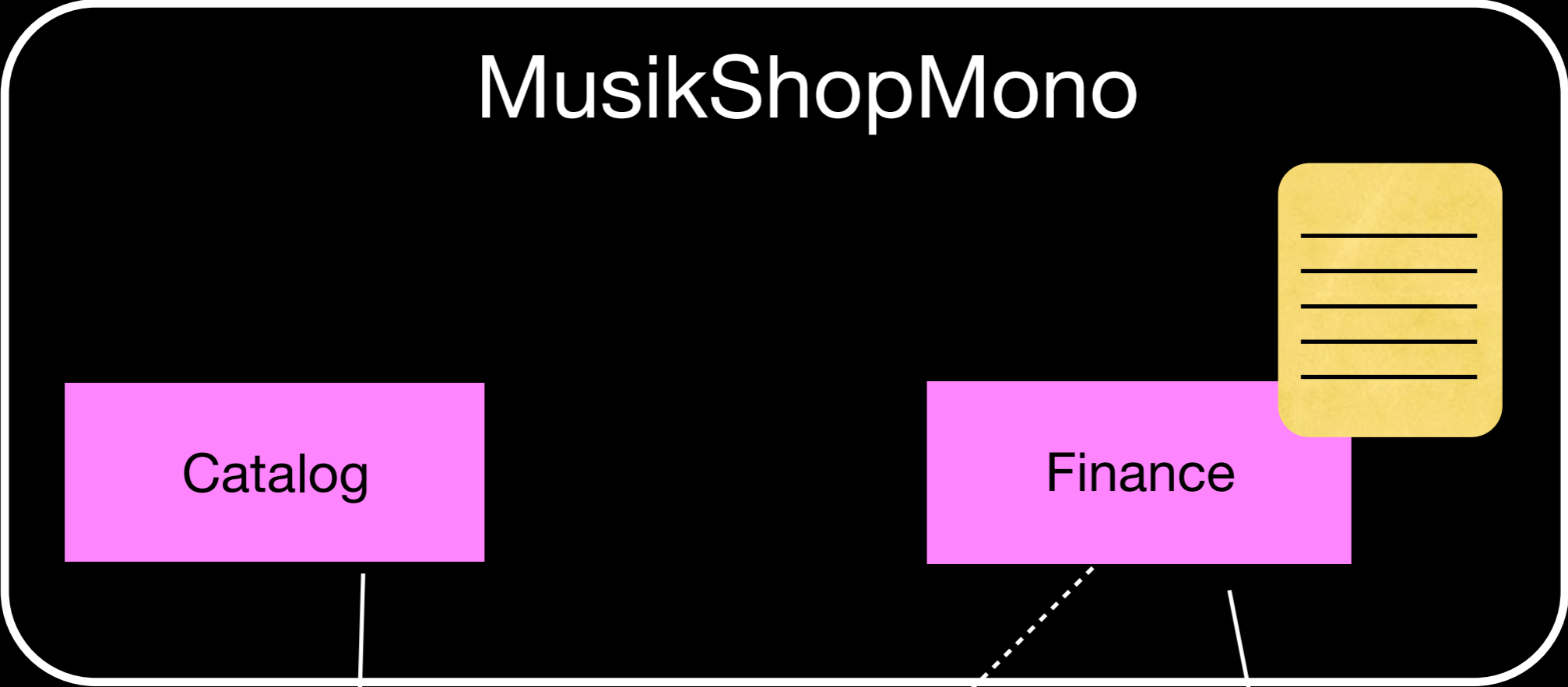



Line Items


Ledger



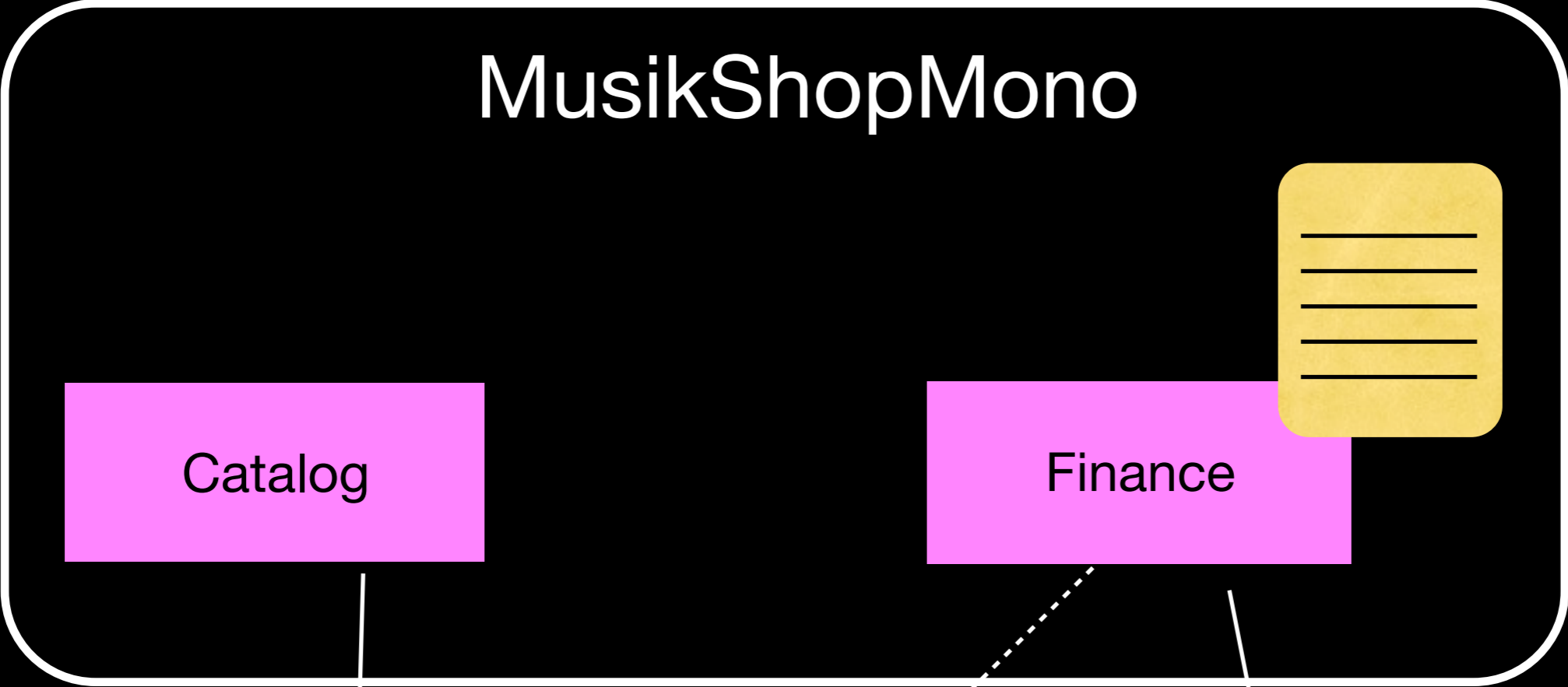
# MusikShopMono




Line Items


Ledger

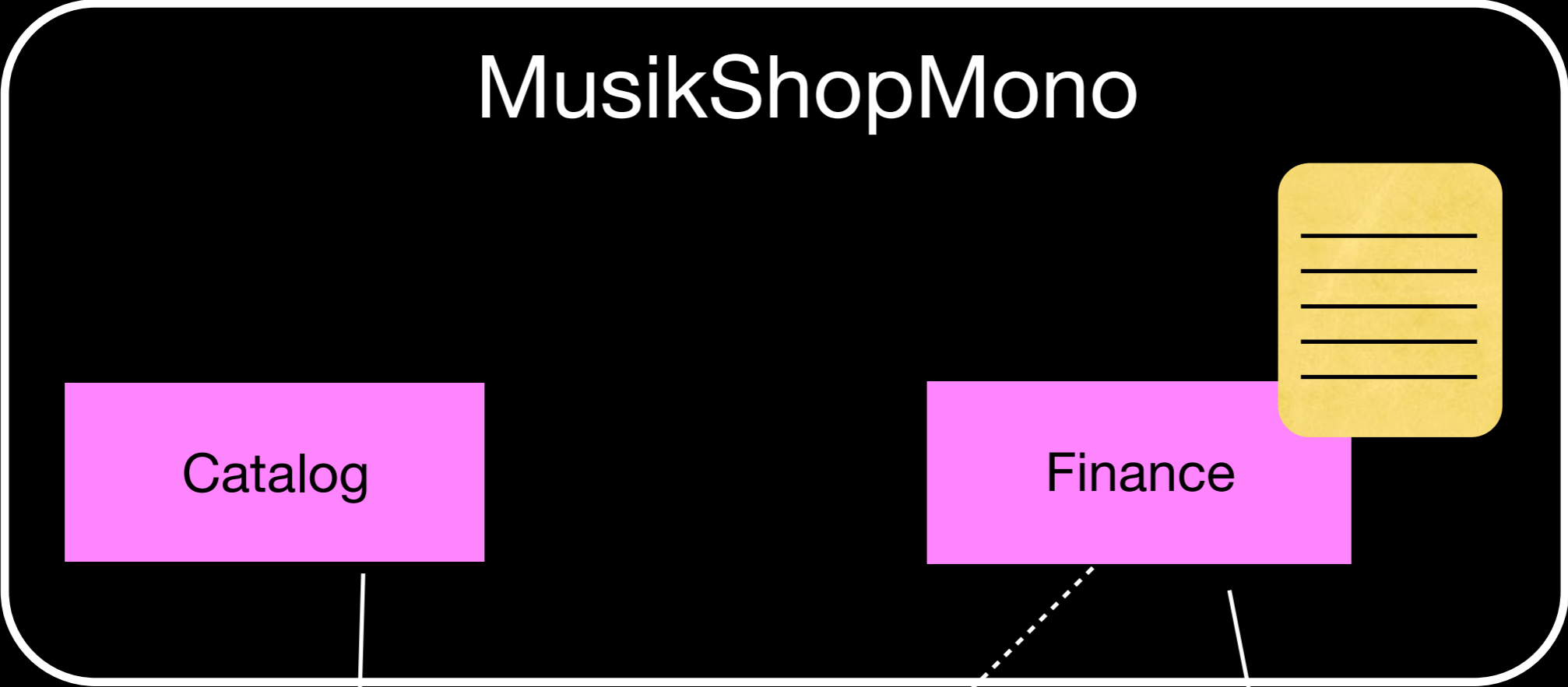
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Line Items


Ledger

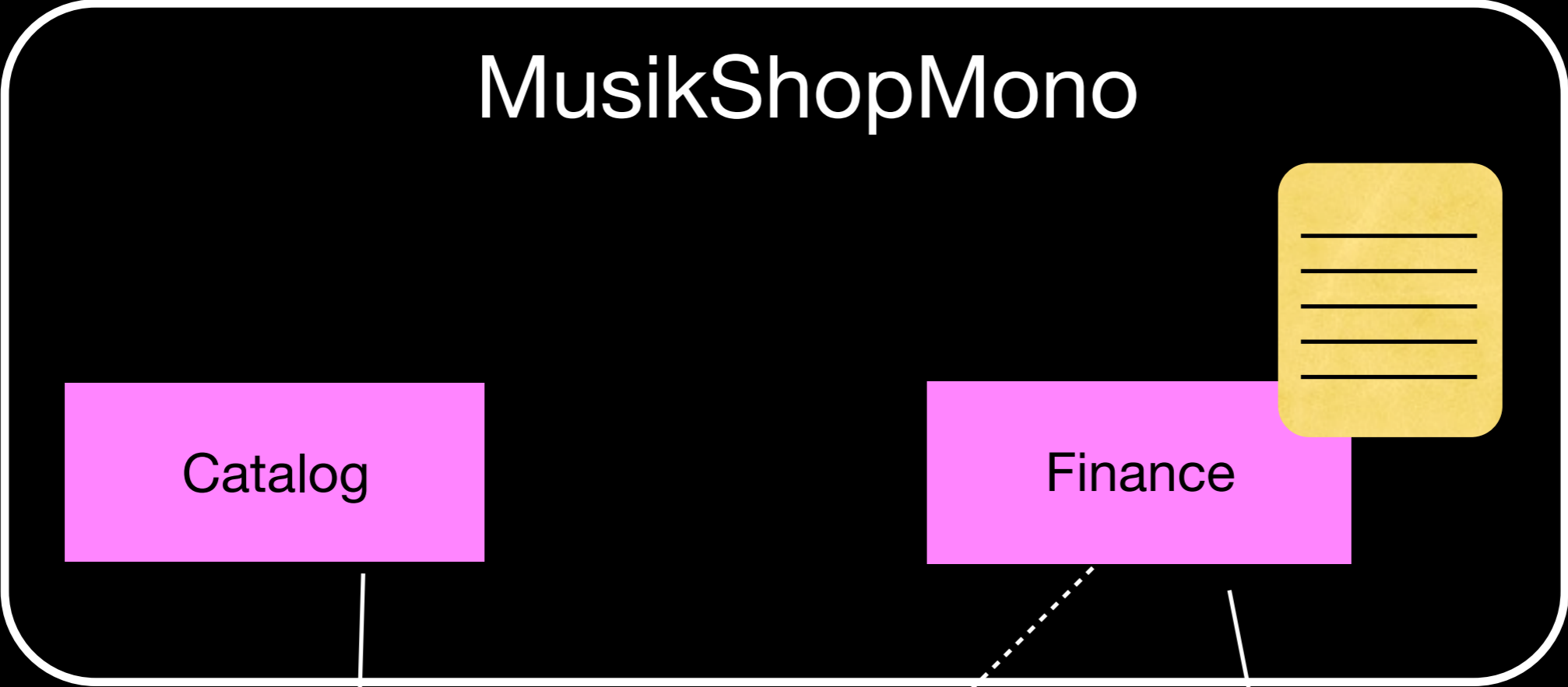
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Line Items


Ledger

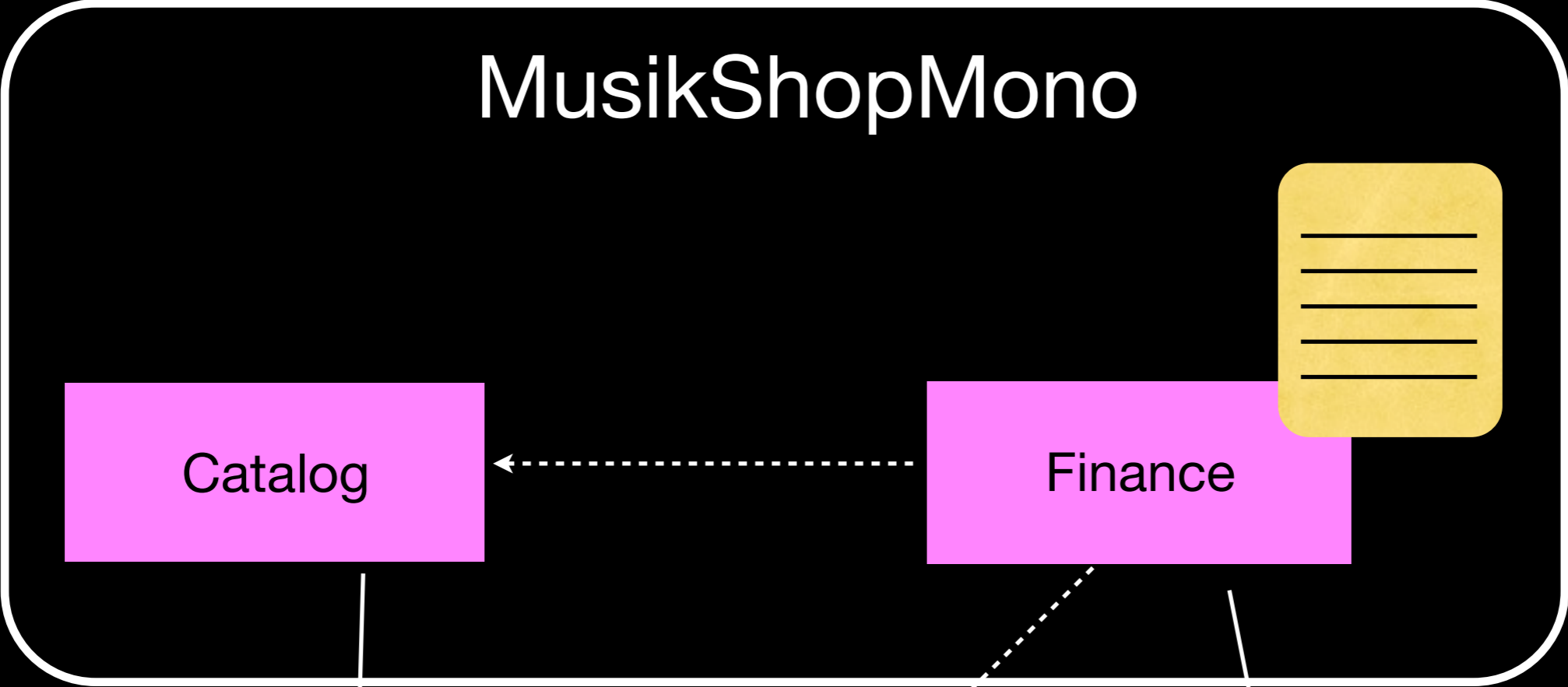
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Line Items

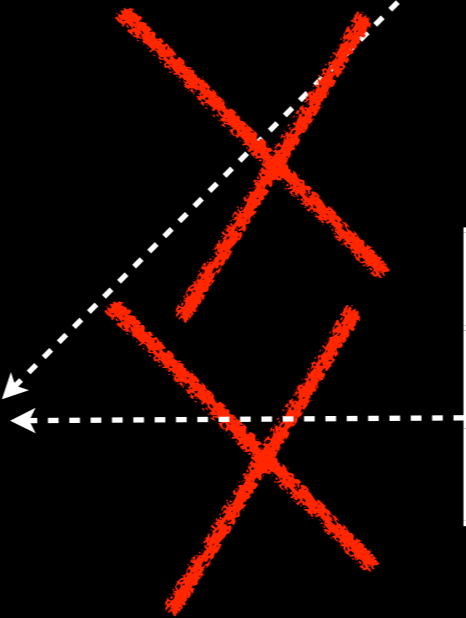

Ledger

# MusikShopMono




Line Items


Ledger



# MusikShop System

Catalog Service

Finance Service

# MusikShop System

Catalog Service



Finance Service

# MusikShop System

Catalog Service

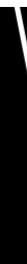
Finance Service




Line Items



# MusikShop System

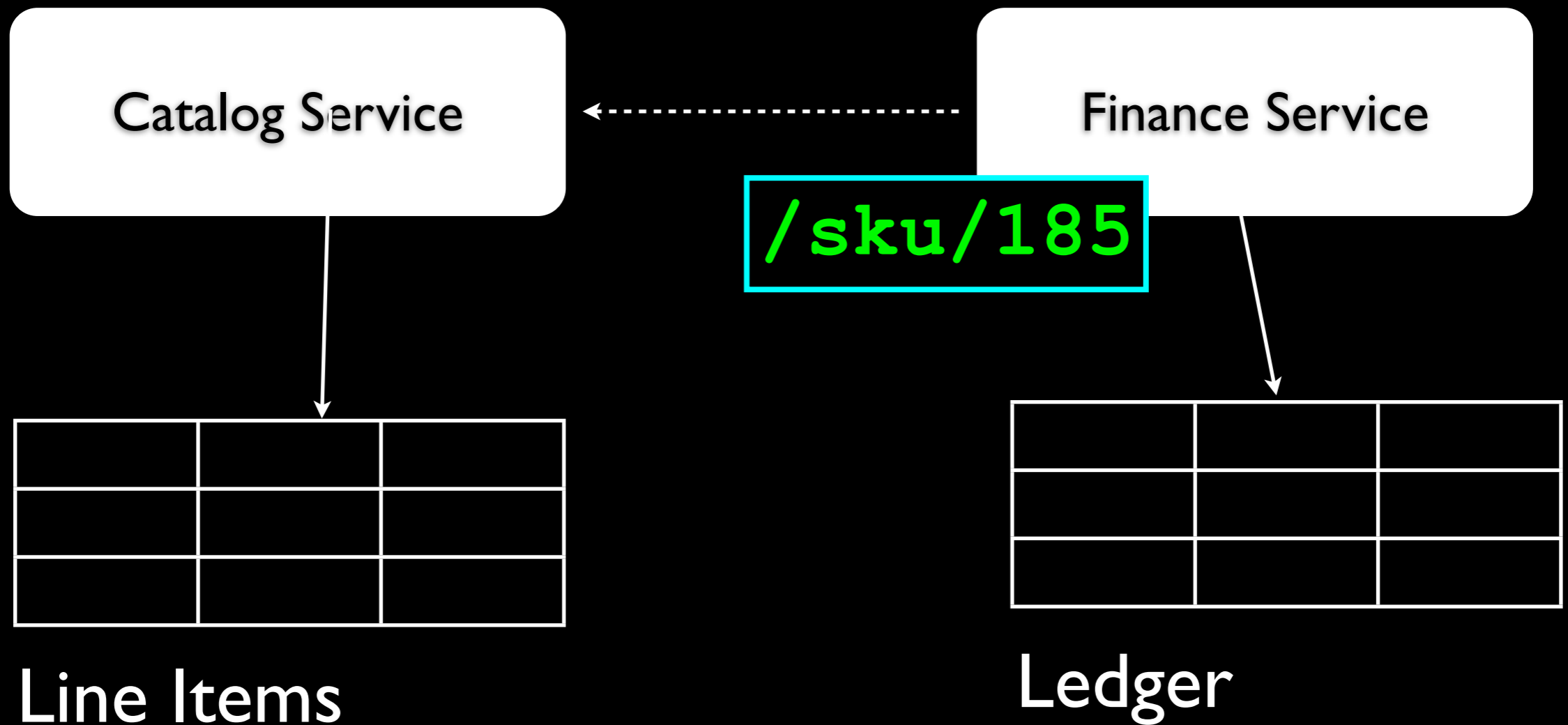




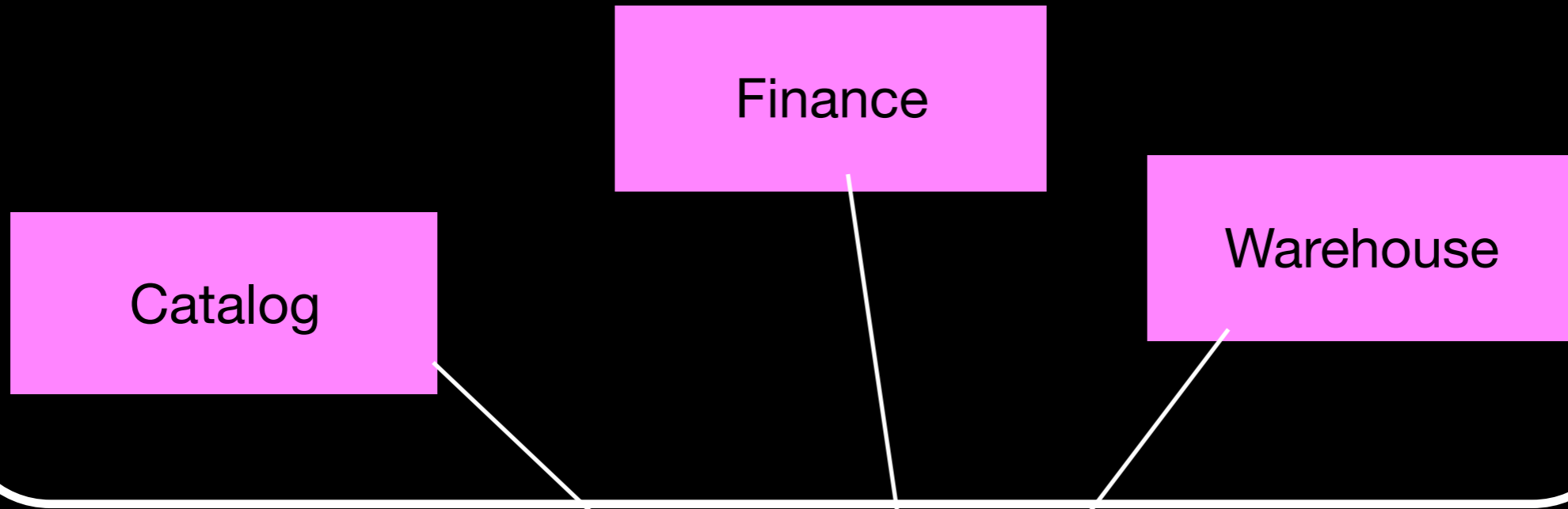
Line Items

Ledger

# MusikShop System



# MusikShopMono




Country Codes

# MusikShopMono

Finance

Warehouse

Catalog


Country Codes


Country Codes


Country Codes

#gotoaar

@samnewman

# MusikShopMono

Finance

Warehouse

Catalog



# MusikShopMono

Finance

Warehouse

The diagram shows two pink rectangular boxes labeled 'Finance' and 'Warehouse' at the top. Two white arrows originate from the bottom center of each box and point downwards towards a table. The table is a 3x3 grid with white borders and empty cells.



Customer Record

reify

#gotoaar

@samnewman

# re·i·fy

/'rēə, fī/ 

**Verb**

Make (something abstract) more concrete or real.

**Synonyms**

materialize - objectify

[More info - Dictionary.com](#) - [Answers.com](#) - [The Free Dictionary](#)



# MusikShop

Finance

Warehouse

The diagram shows two pink rectangular boxes labeled 'Finance' and 'Warehouse' at the top. Two white arrows originate from the bottom of these boxes and point towards a table below. The table is a 3x3 grid with white borders and empty cells.


Customer Record

# MusikShop

Finance

Warehouse

Customer

```
graph TD; Finance[Finance] --> Customer[Customer]; Warehouse[Warehouse] --> Customer; Customer --> Record[Customer Record];
```


Customer Record

# MusikShop System

Finance Service

Warehouse Service

Customer Service

```
graph TD; Finance[Finance Service] --> Customer[Customer Service]; Warehouse[Warehouse Service] --> Customer;
```

# MusikShop

Catalog

Warehouse

The diagram shows two pink rectangular boxes labeled 'Catalog' and 'Warehouse' inside a rounded white border. Two white arrows originate from the bottom of these boxes and point towards a table below. The table has three columns and three rows.


Item

# MusikShop

Catalog

Warehouse

The diagram shows two pink rectangular boxes labeled 'Catalog' and 'Warehouse' inside a rounded white border. Two white arrows originate from the bottom of these boxes and point towards a table below. The table has three columns and three rows.


Item

Bee Gees Hits | \$4.99 | 45

# MusikShop

Catalog

Warehouse


Item

Bee Gees Hits | \$4.99 | 45

# MusikShop

Catalog

Warehouse


Item

Bee Gees Hits | \$4.99 | 45

# MusikShop

Catalog

Warehouse


Catalog Item


Stock Levels





Tea Time tea cup

£6

Great British Collection  
Now Panic & Freak Out

#gotoaar

@samnewman



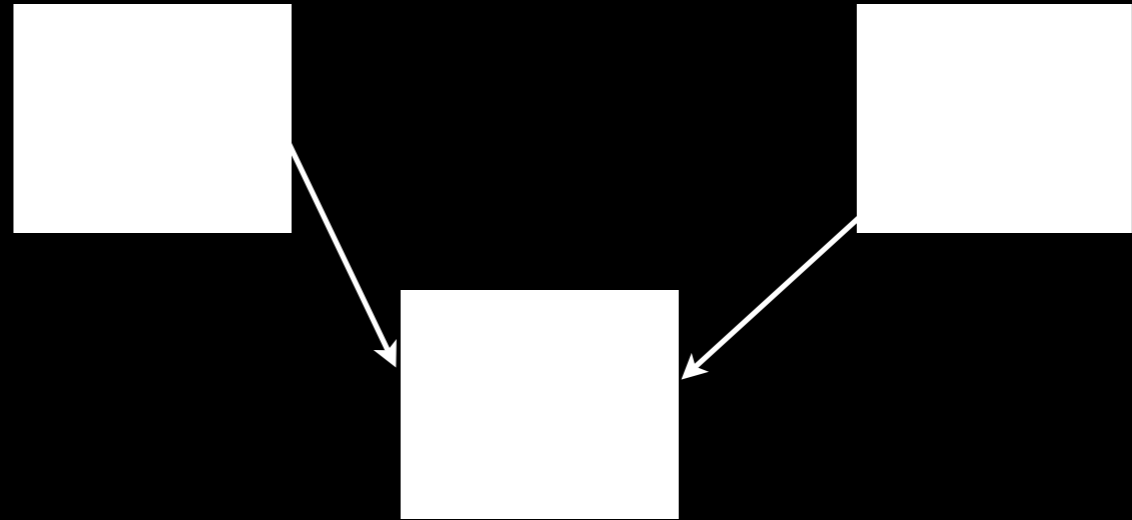
#gotoaar

@samnewman



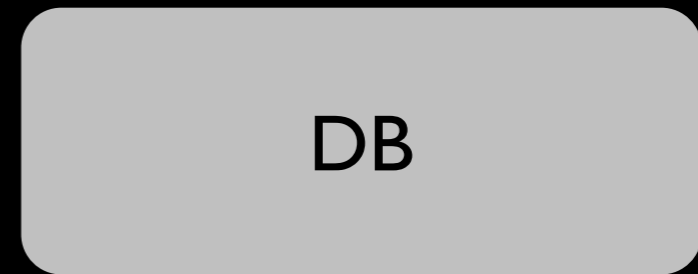
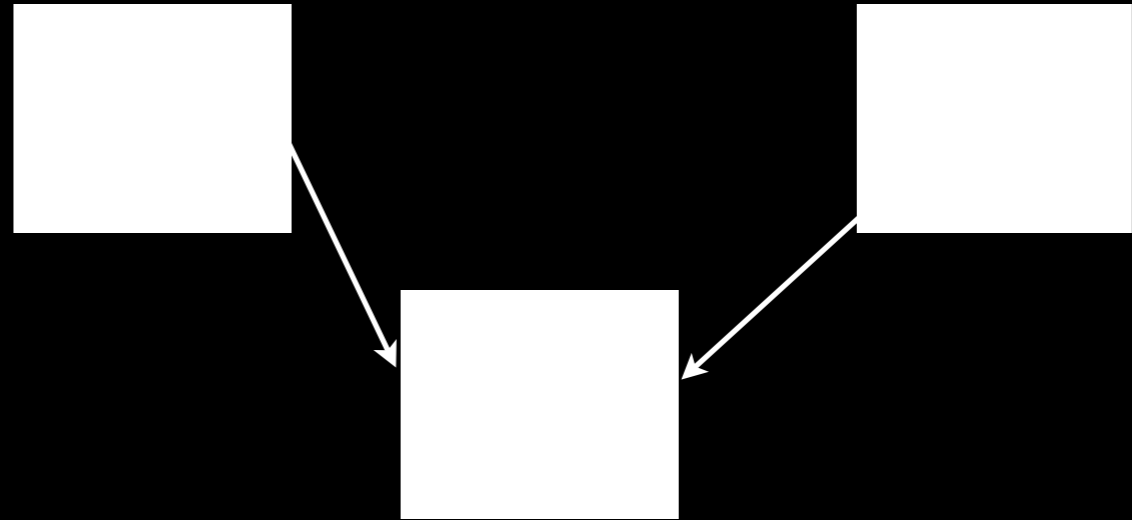
#gotoaar

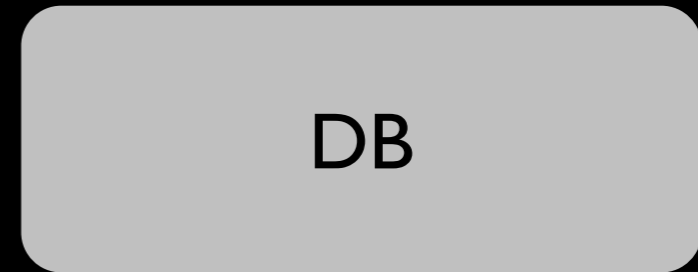
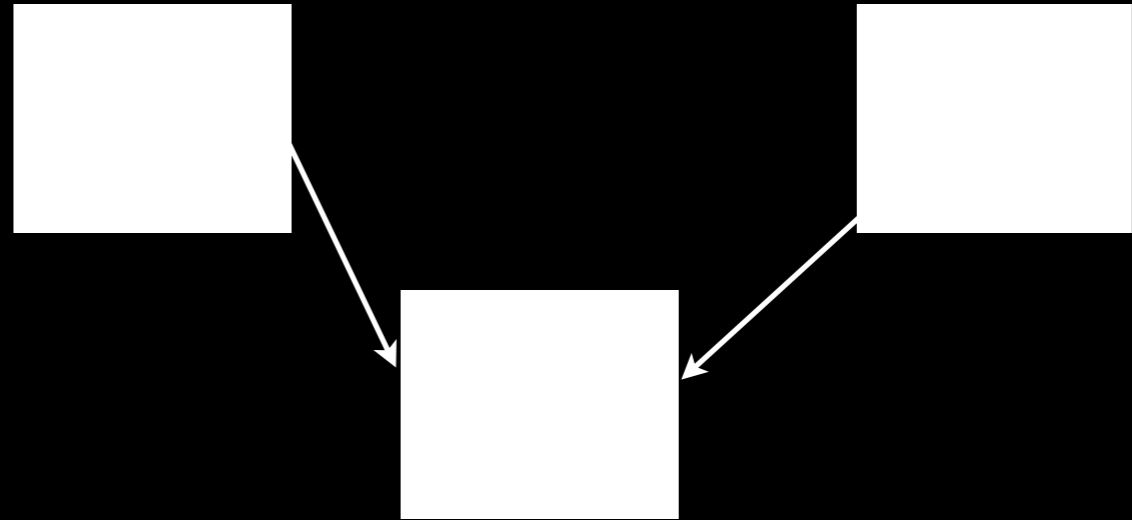
@samnewman



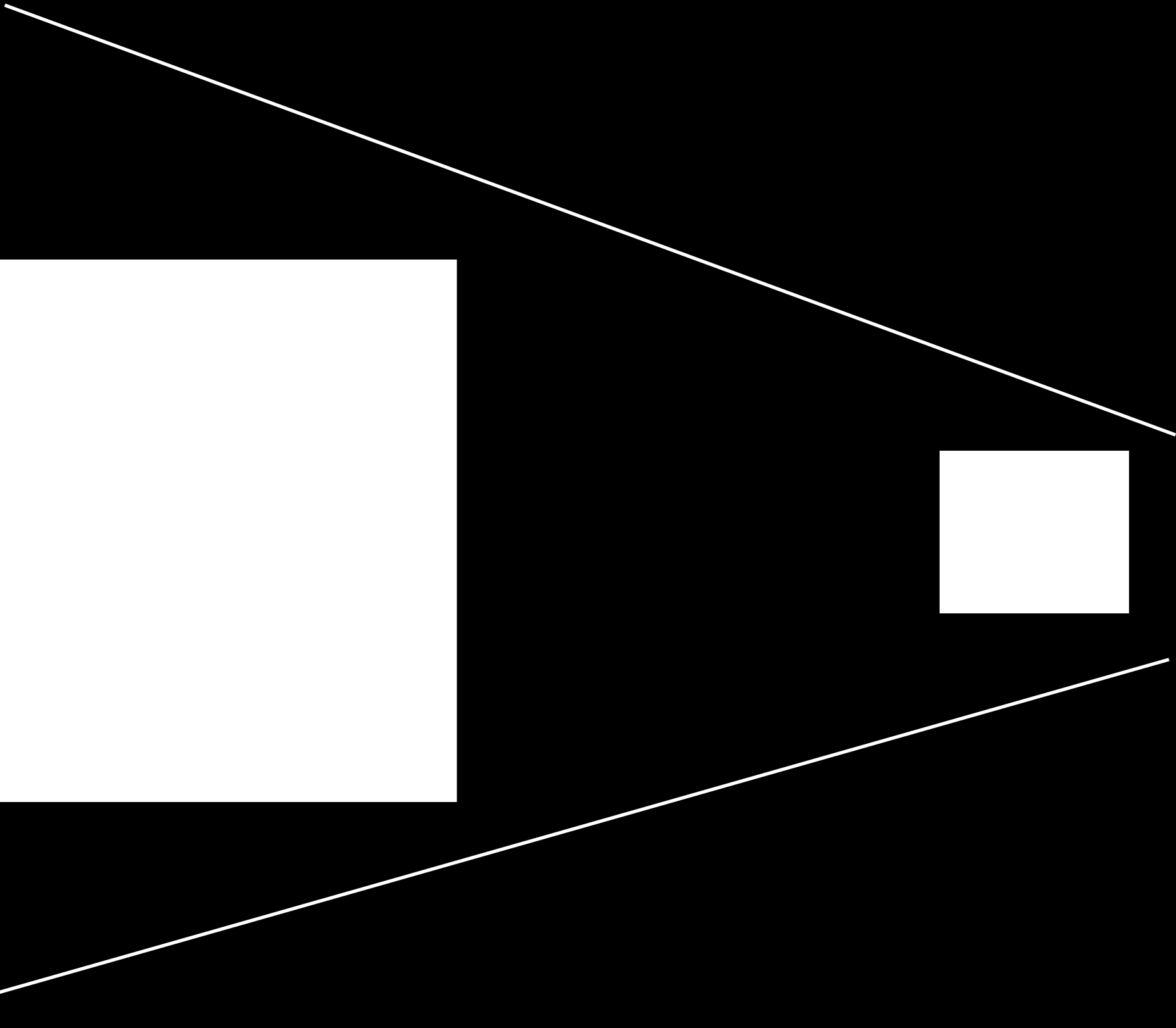
#gotoaar

@samnewman





Cost Of Change



#gotoaar

@samnewman

# Microservices

#gotoaar

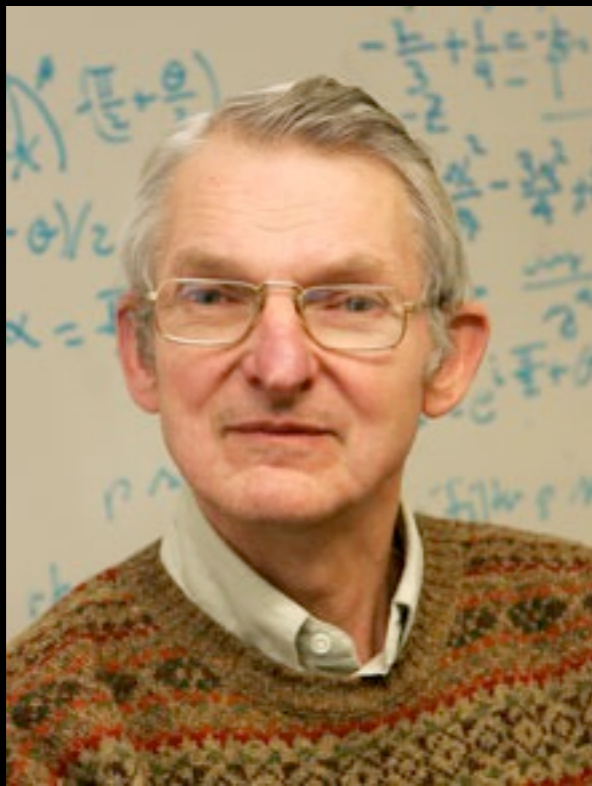
@samnewman



# UNIX Way

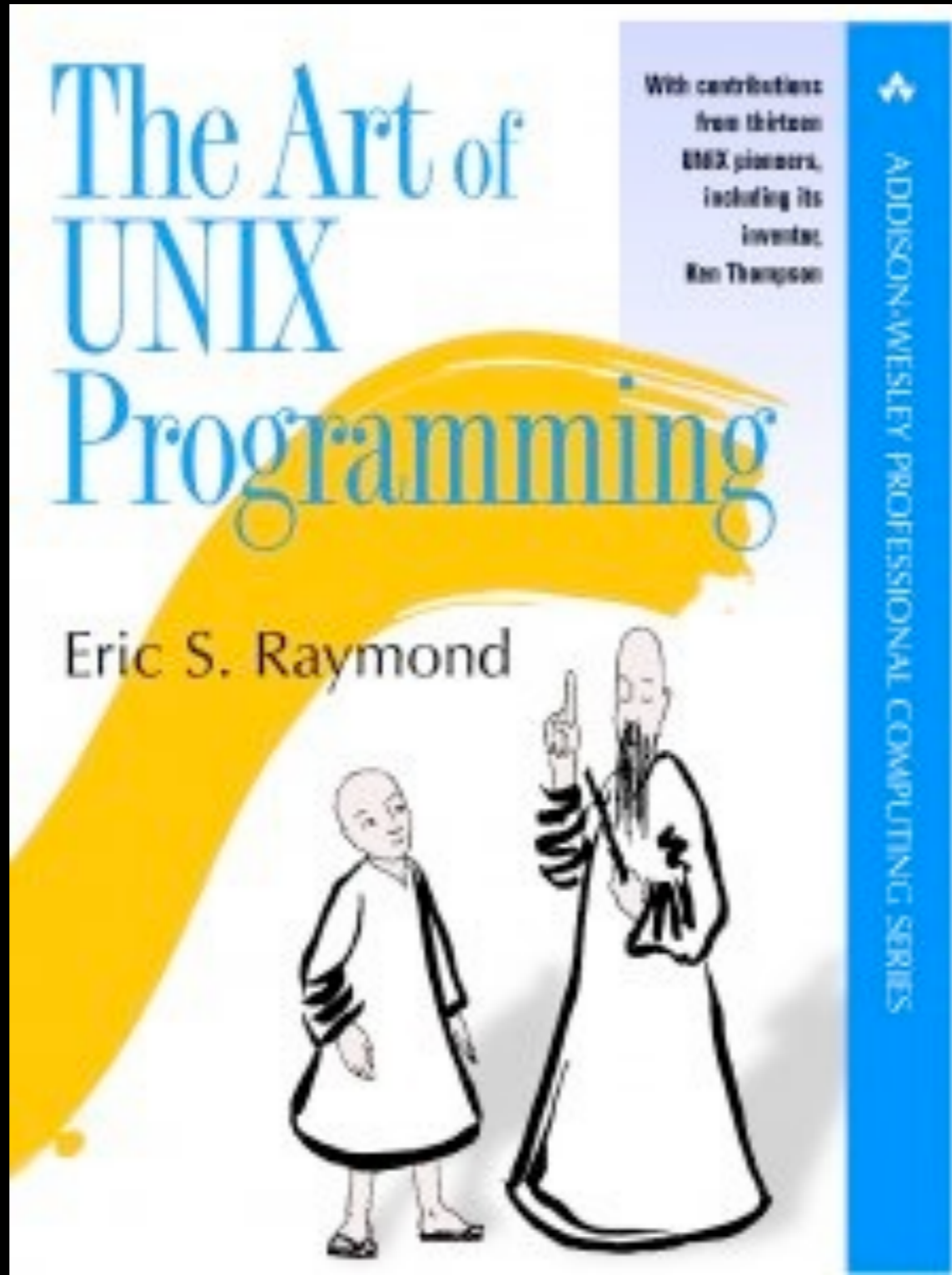
#gotoaar

@samnewman



*“This is the Unix philosophy: Write programs that do one thing and do it well. Write programs to work together. Write programs to handle text streams, because that is a universal interface”*

*- Douglas McIlroy*



#gotoaar

@samnewman

Rule of Modularity: Developers should build a program out of simple parts connected by well defined interfaces, so problems are local, and parts of the program can be replaced in future versions to support new features. This rule aims to save time on debugging complex code that is complex, long, and unreadable.

Rule of Simplicity: Developers should design for simplicity by looking for ways to break up program systems into small, straightforward cooperating pieces. This rule aims to discourage developers' affection for writing "intricate and beautiful complexities" that are in reality bug prone programs.

Rule of Parsimony: Developers should avoid writing big programs. This rule aims to prevent overinvestment of development time in failed or suboptimal approaches caused by the owners of the program's reluctance to throw away visibly large pieces of work. Smaller programs are not only easier to optimize and maintain; they are easier to delete when deprecated.

1s

#gotoaar

@samnewman

ls | grep "Sam"







#gotoaar

@samnewman



#gotoaar

@samnewman

200 lines of code

#gotoaar

@samnewman

Basket

#gotoaar

@samnewman

Basket

Login

Basket

Login

Registration

Basket

Login

Registration

Recommendation

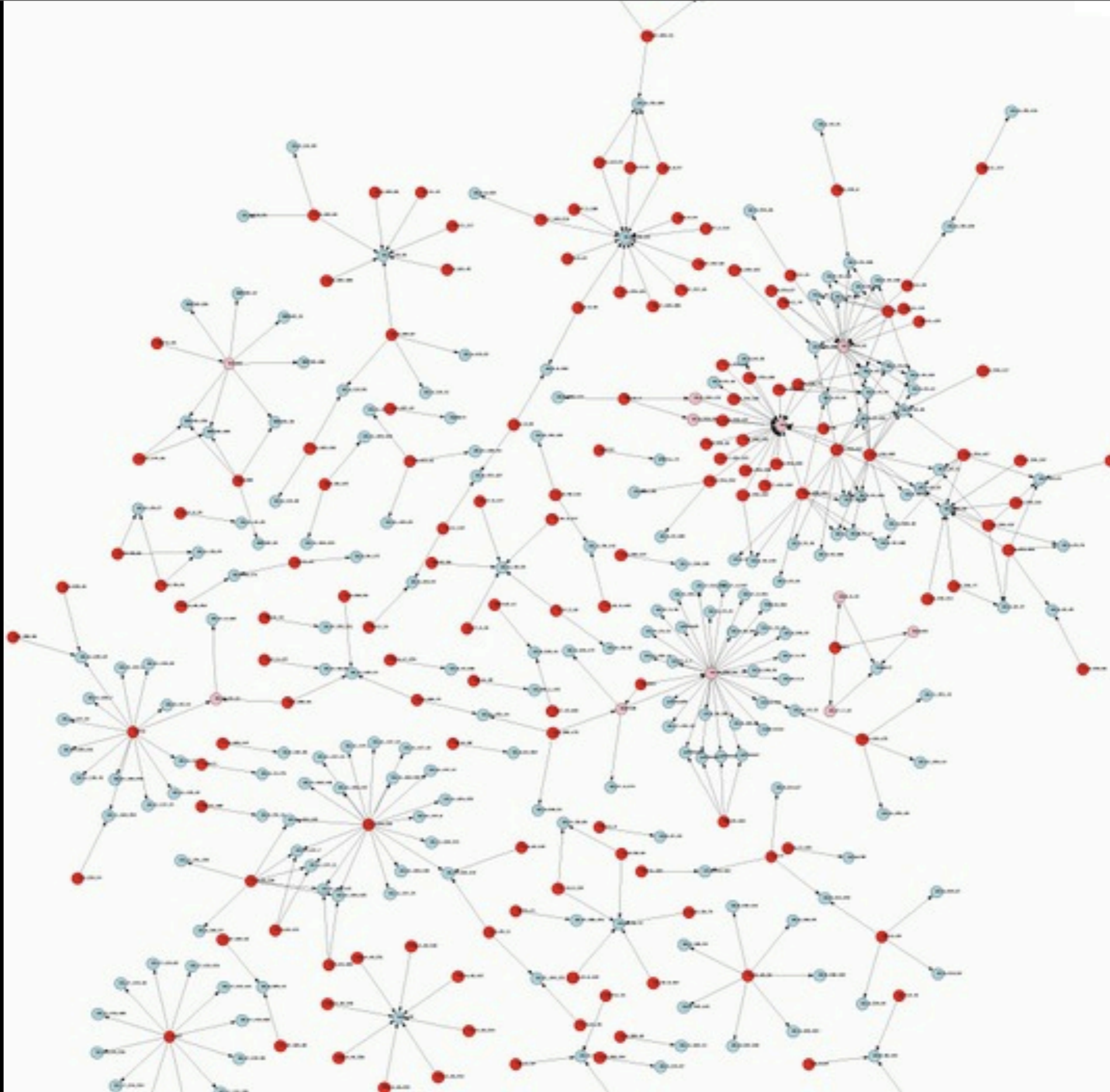


**Basket**

**Login**

**Registration**

**Recommendation  
- Now With Added  
Clojure!**



#gotoaar

@samnewman



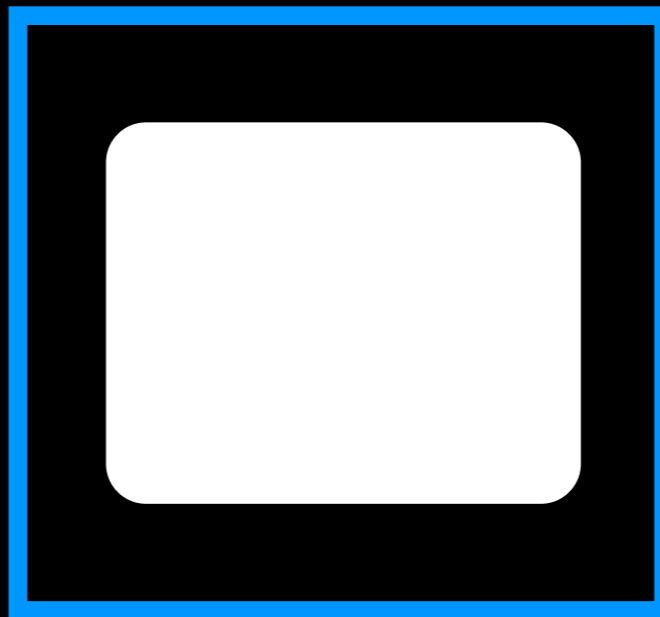
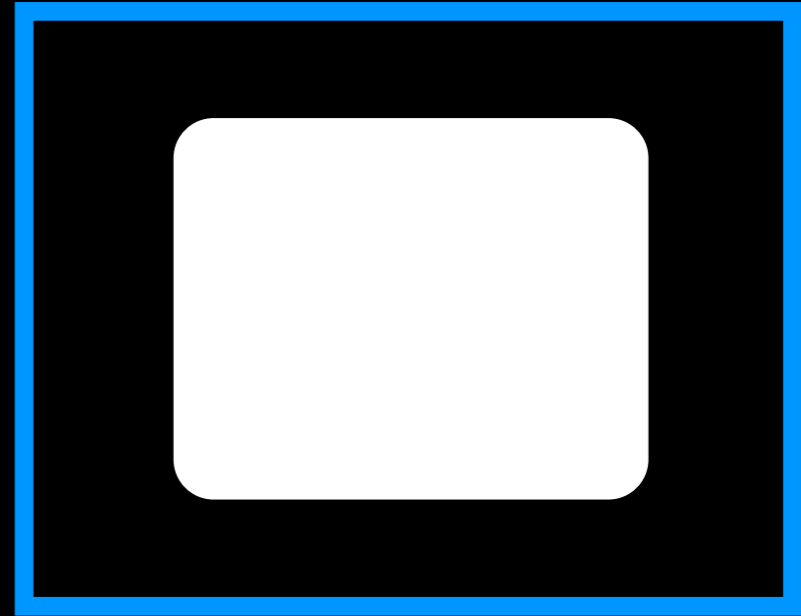
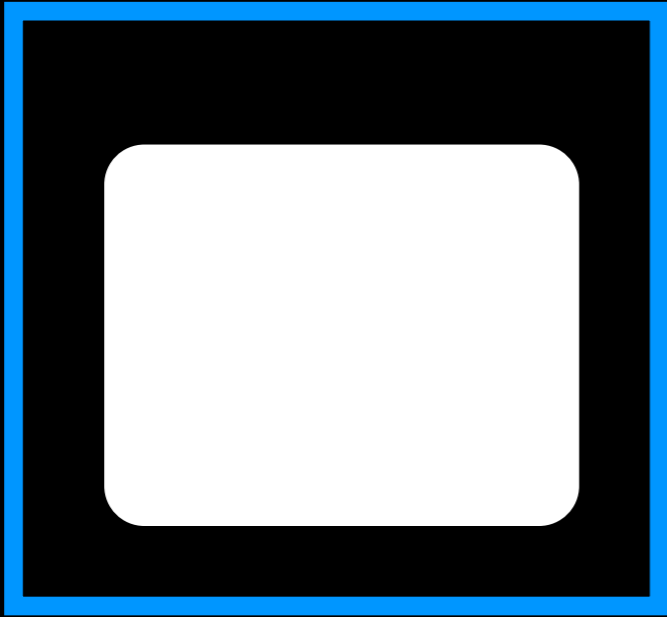
#gotoaar

@samnewman

Test!

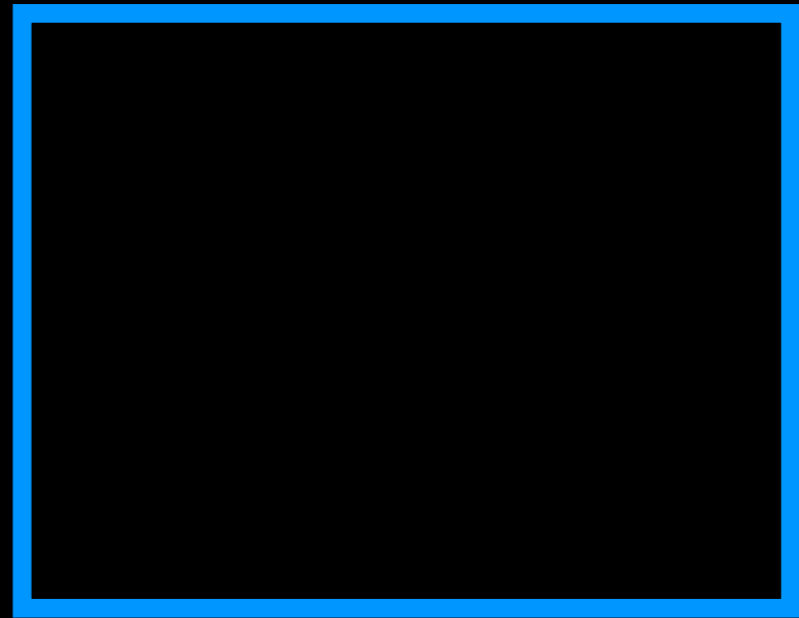
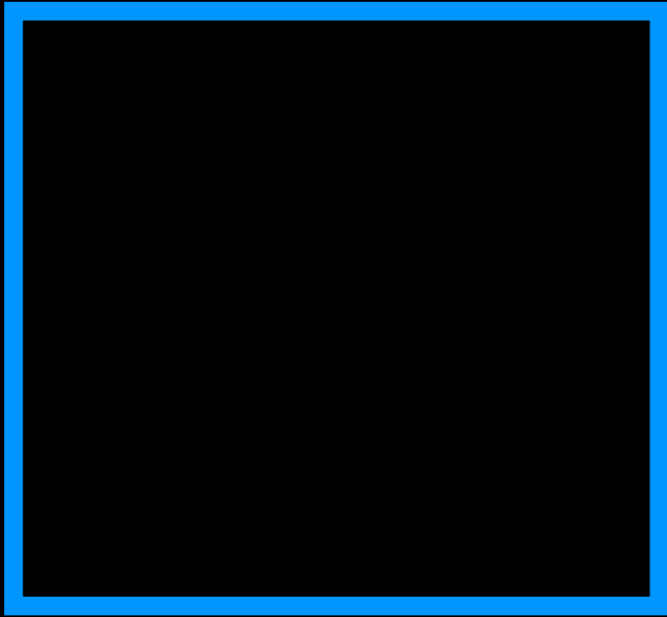
#gotoaar

@samnewman



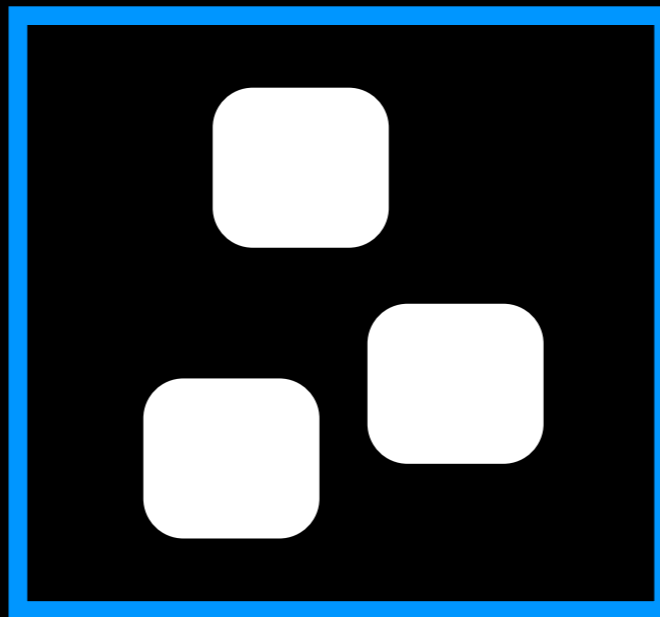
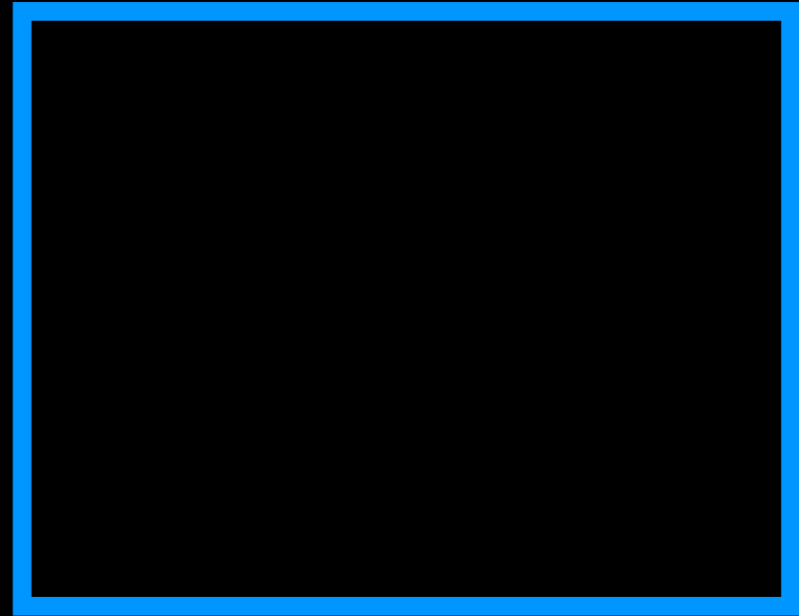
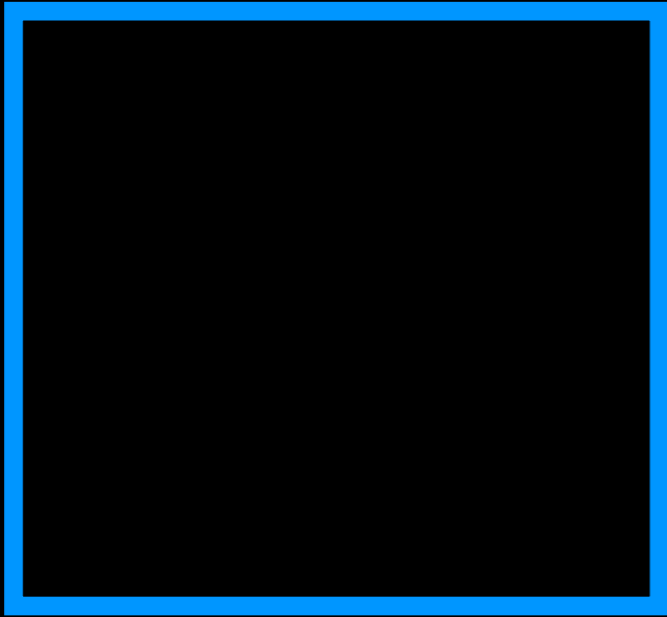
#gotoaar

@samnewman



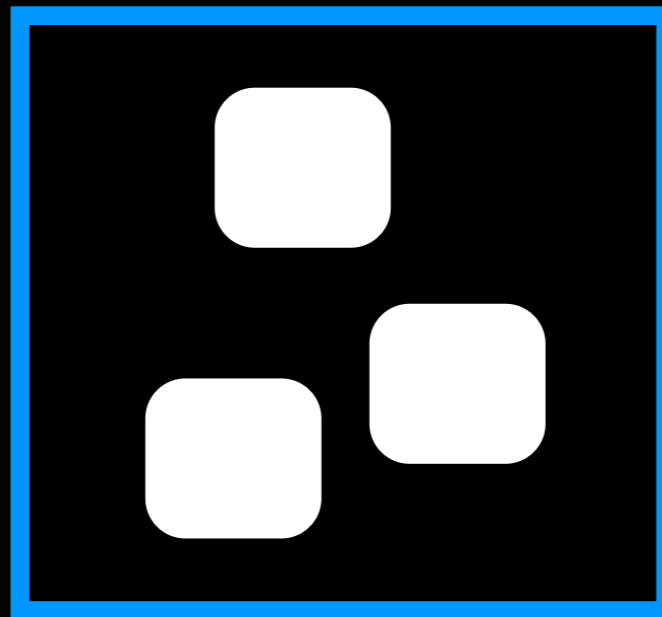
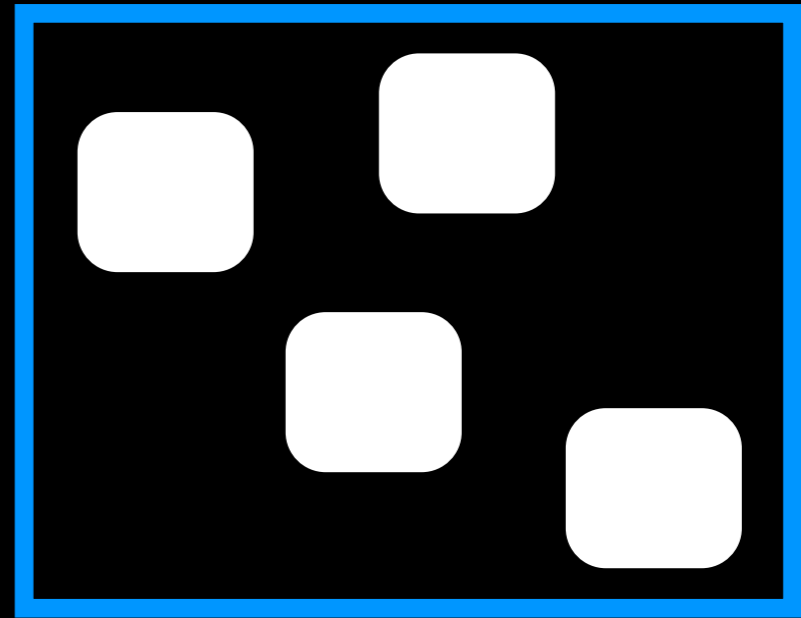
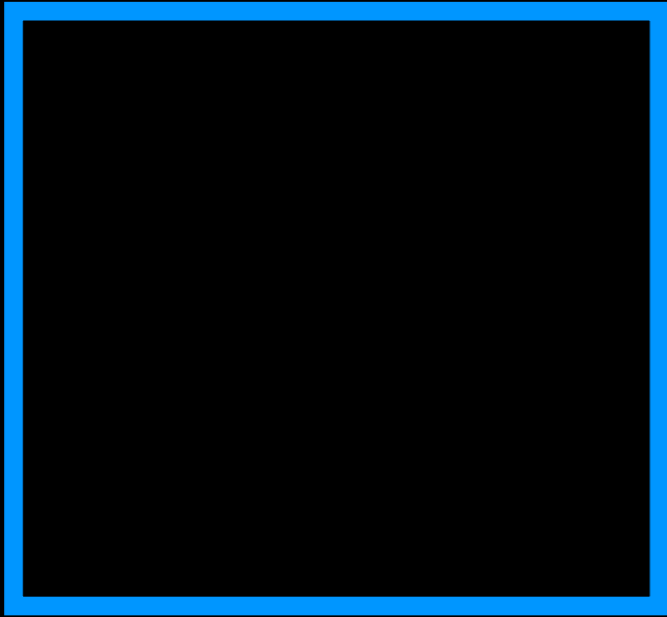
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@samnewman

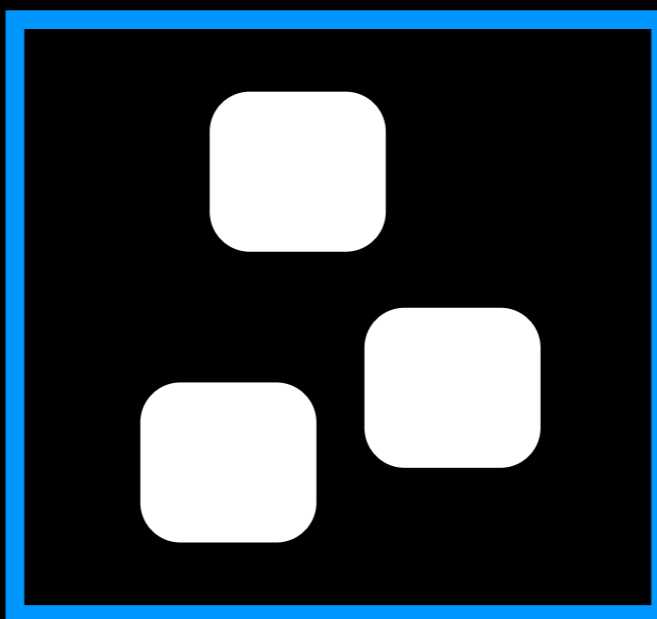
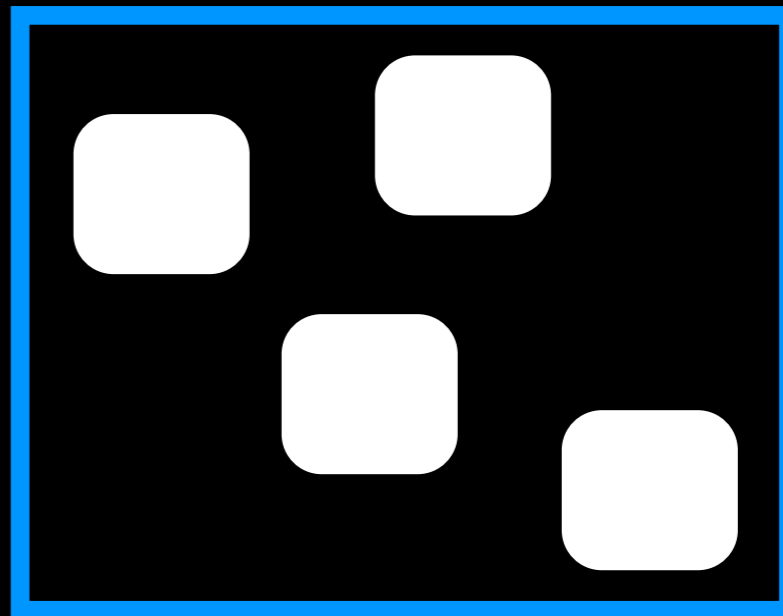
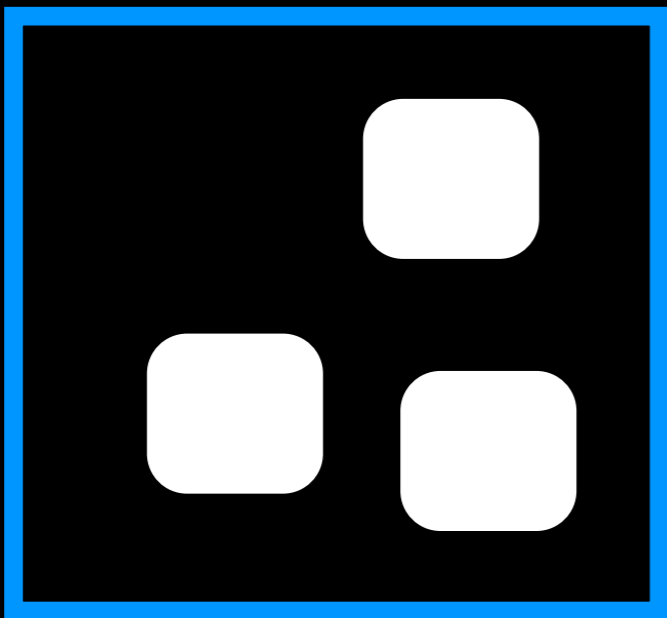


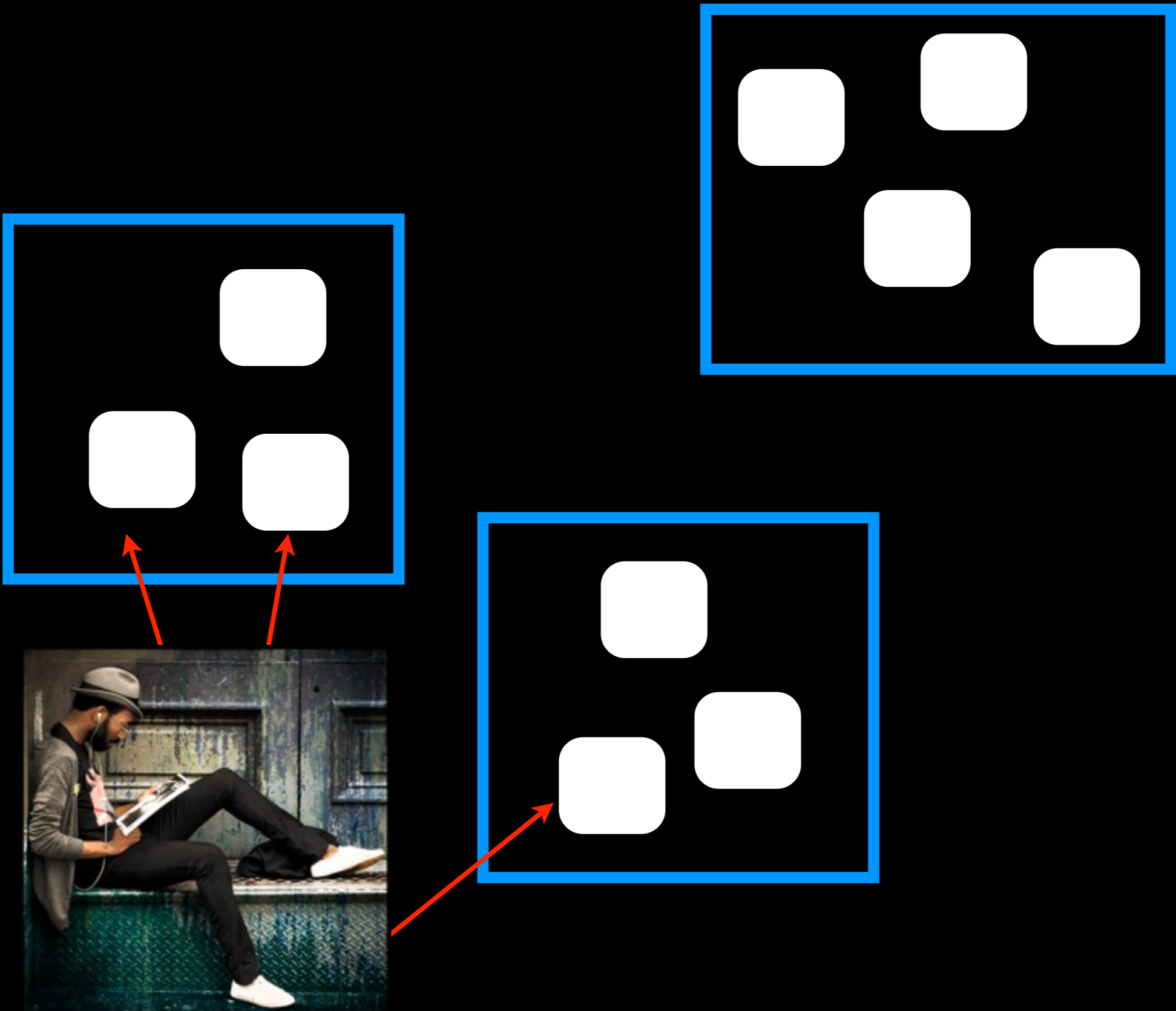
#gotoaar

@samnewman





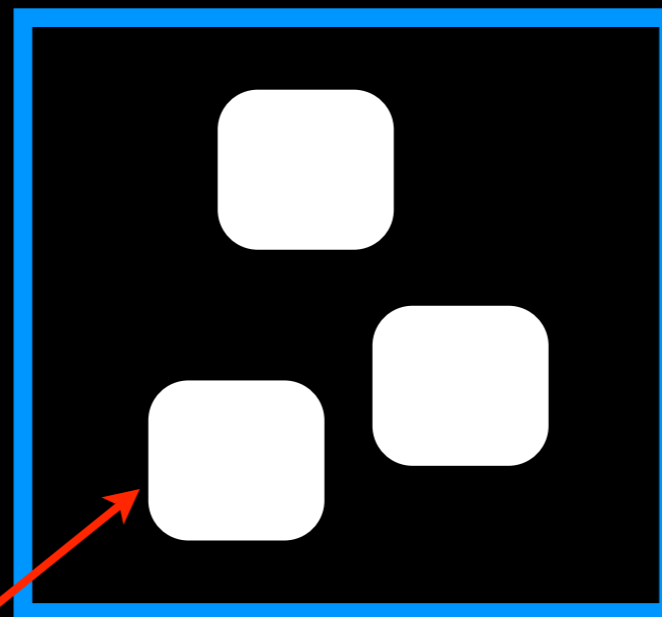
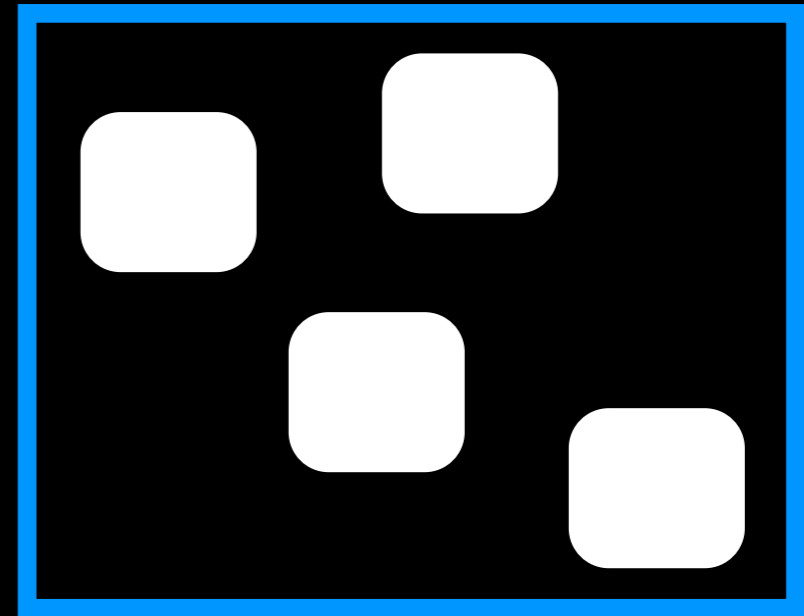
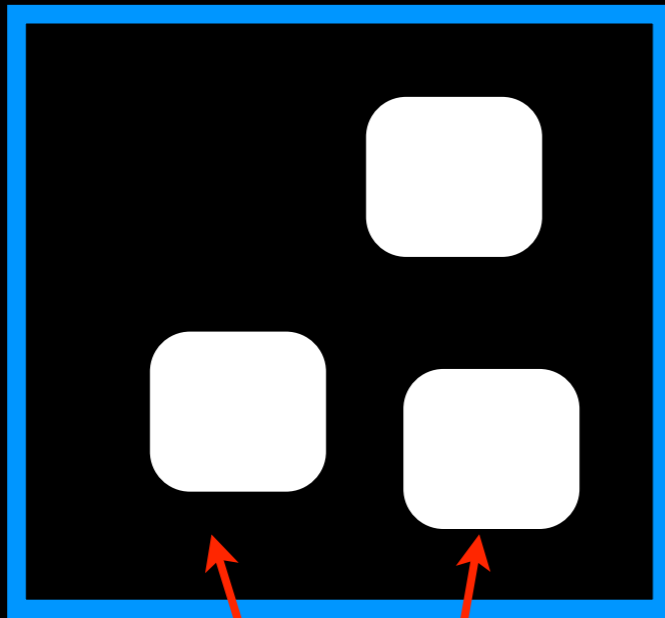




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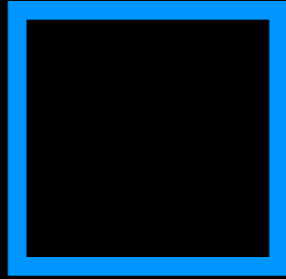
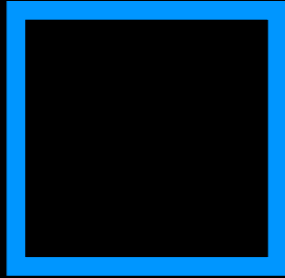
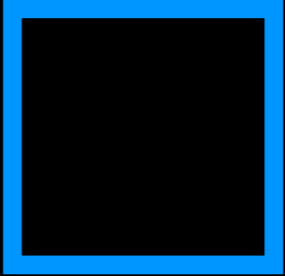
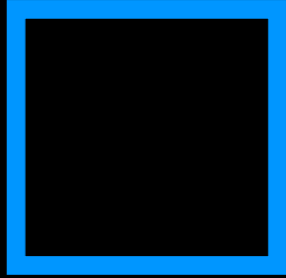
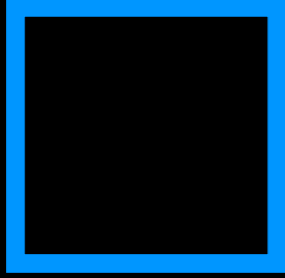
@samnewman

**Alert!!!**



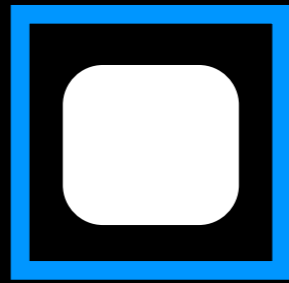
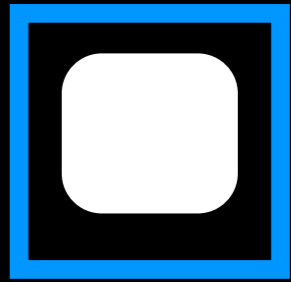
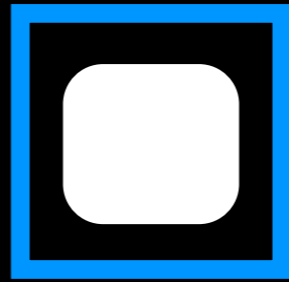
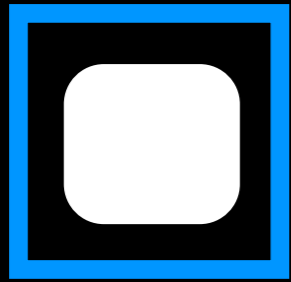
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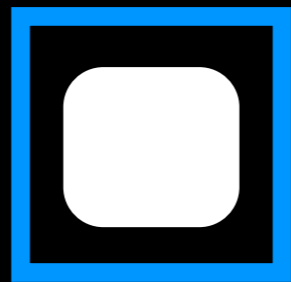
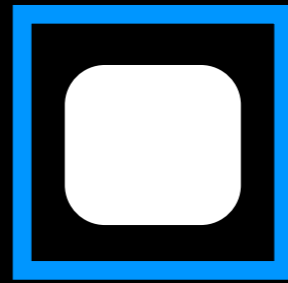
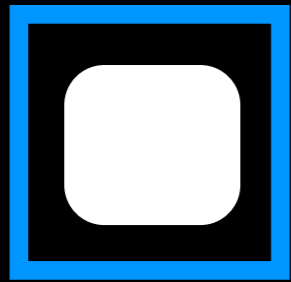
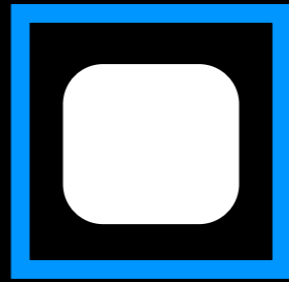
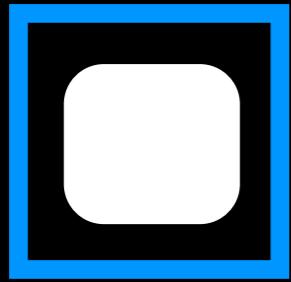
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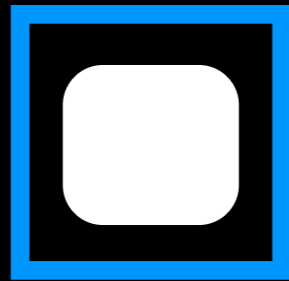
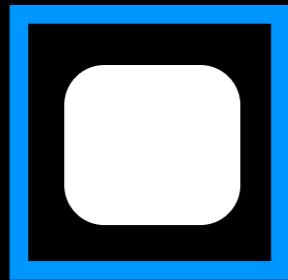
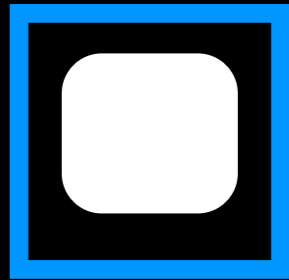
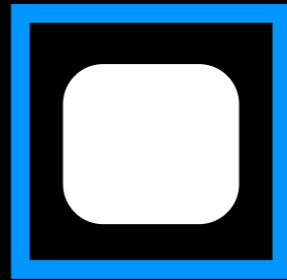
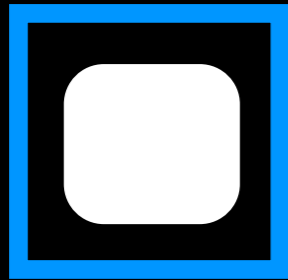
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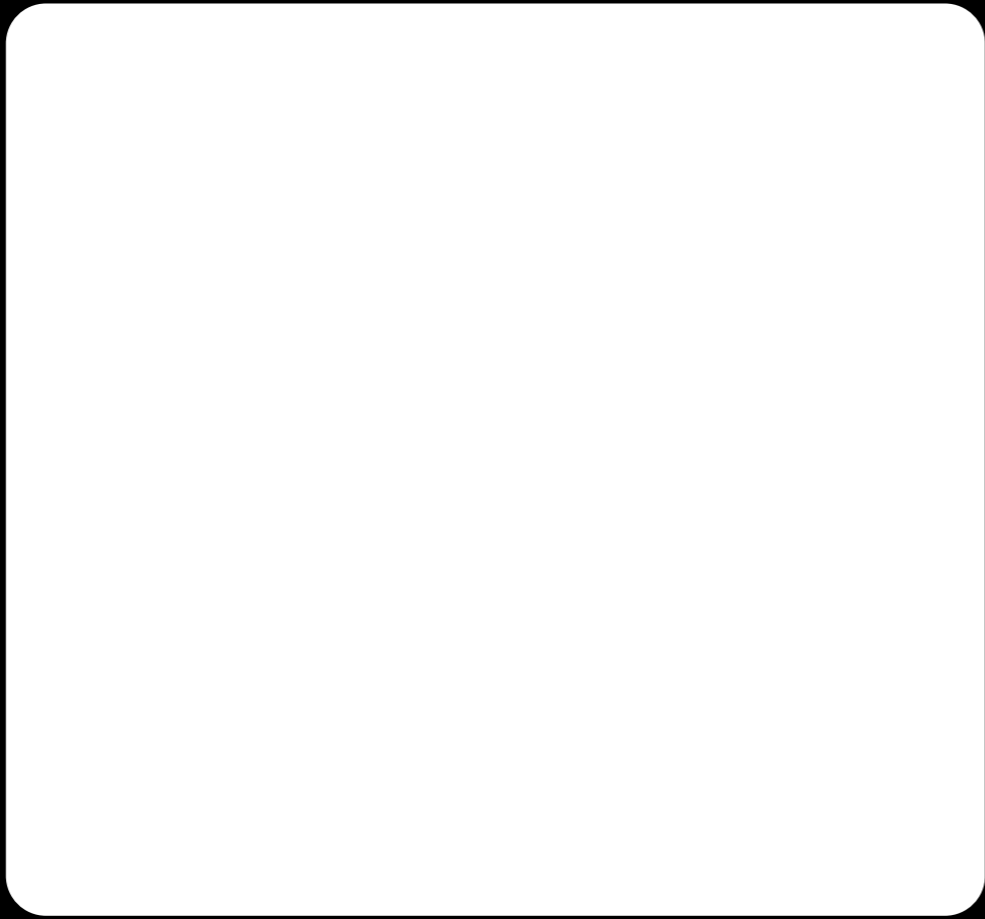
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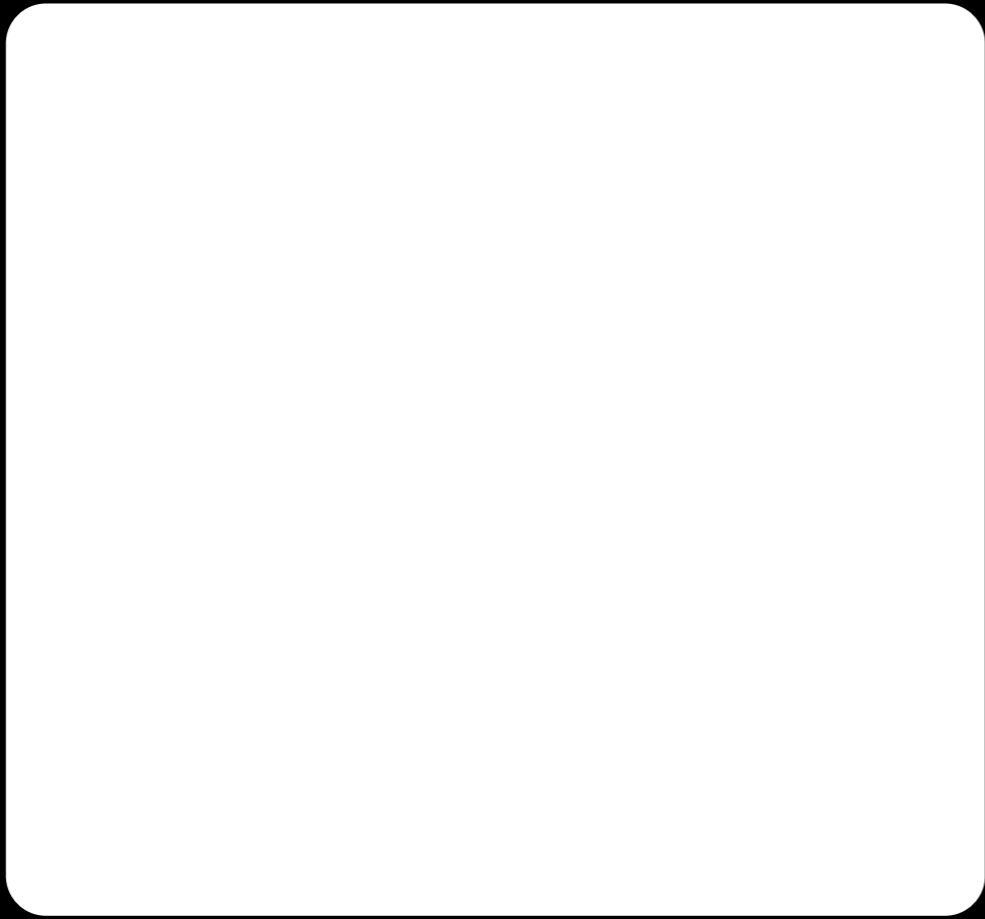
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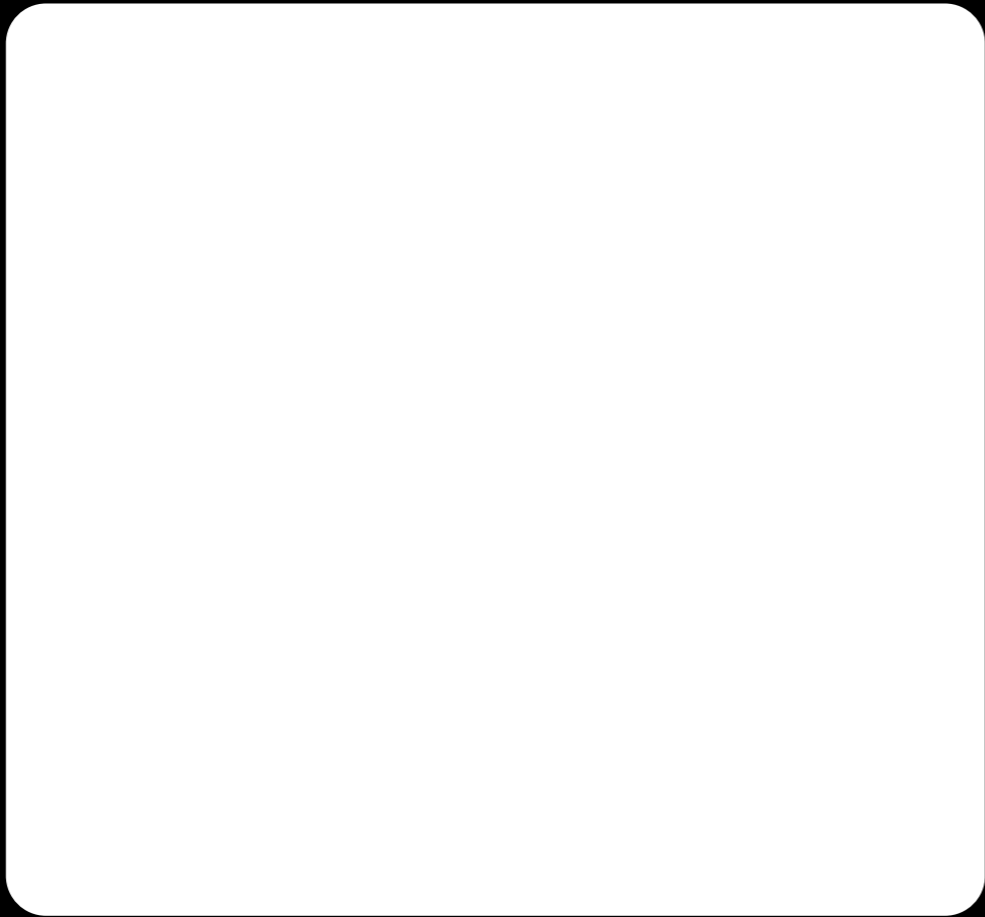




UP

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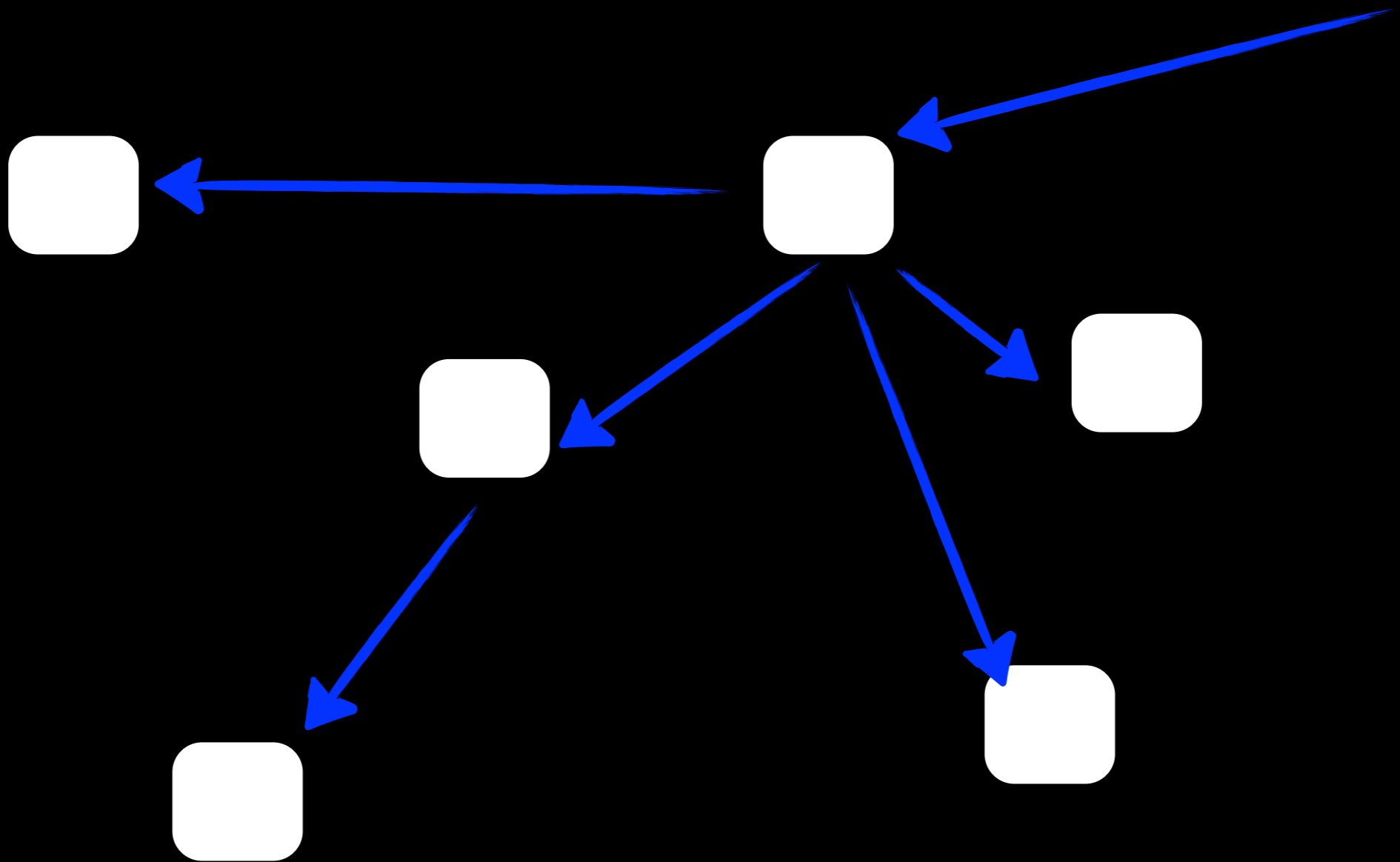
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DOWN

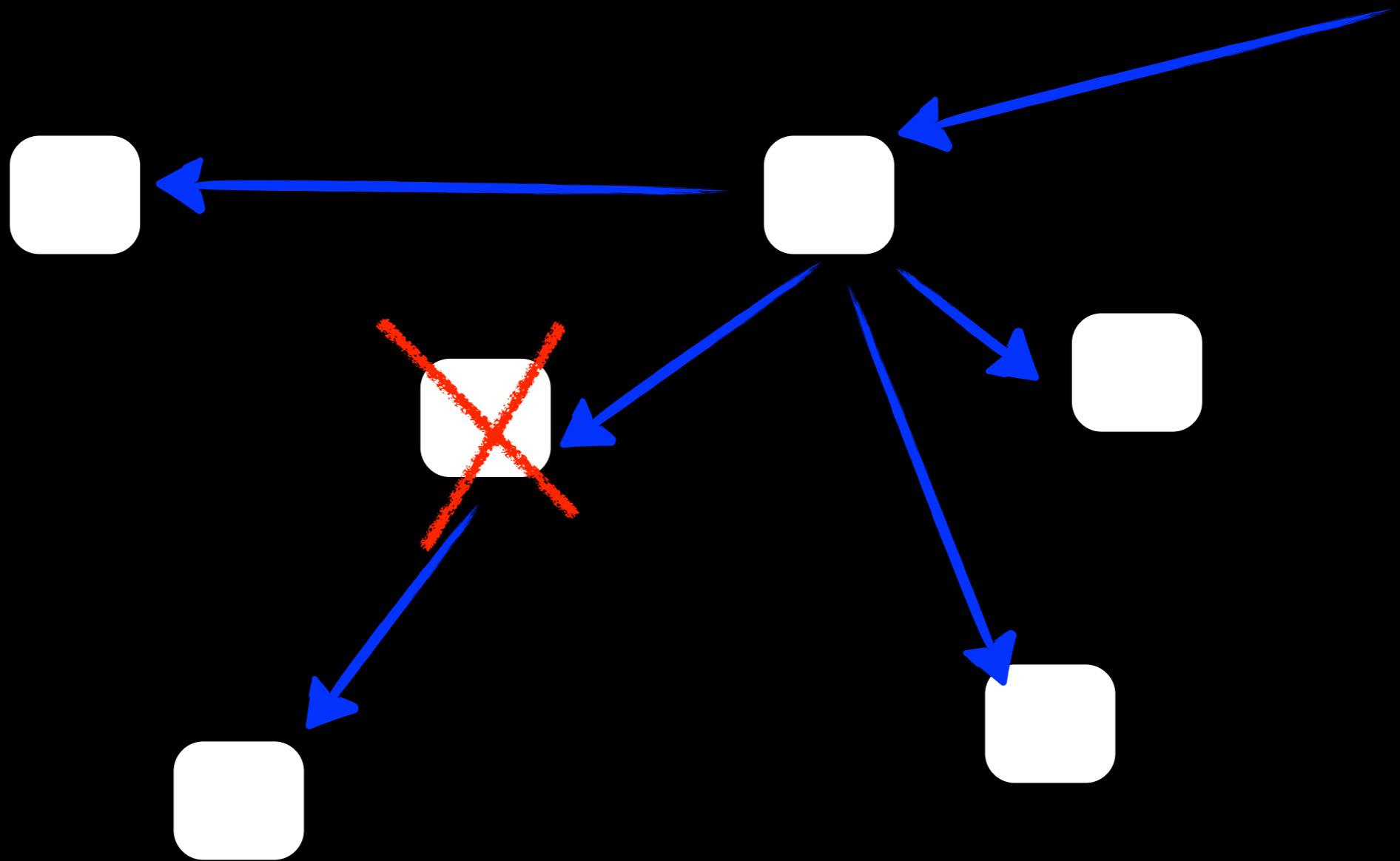
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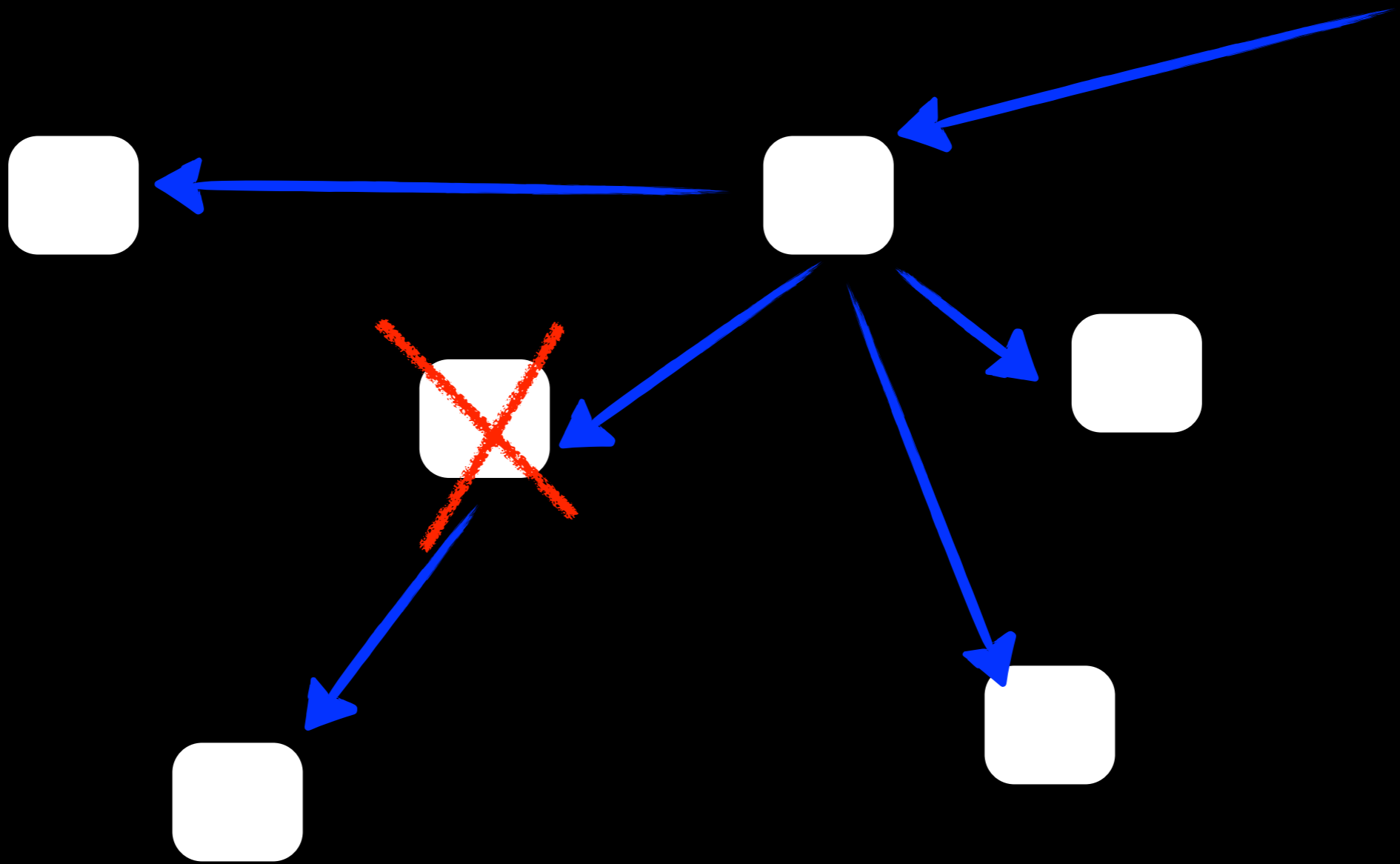
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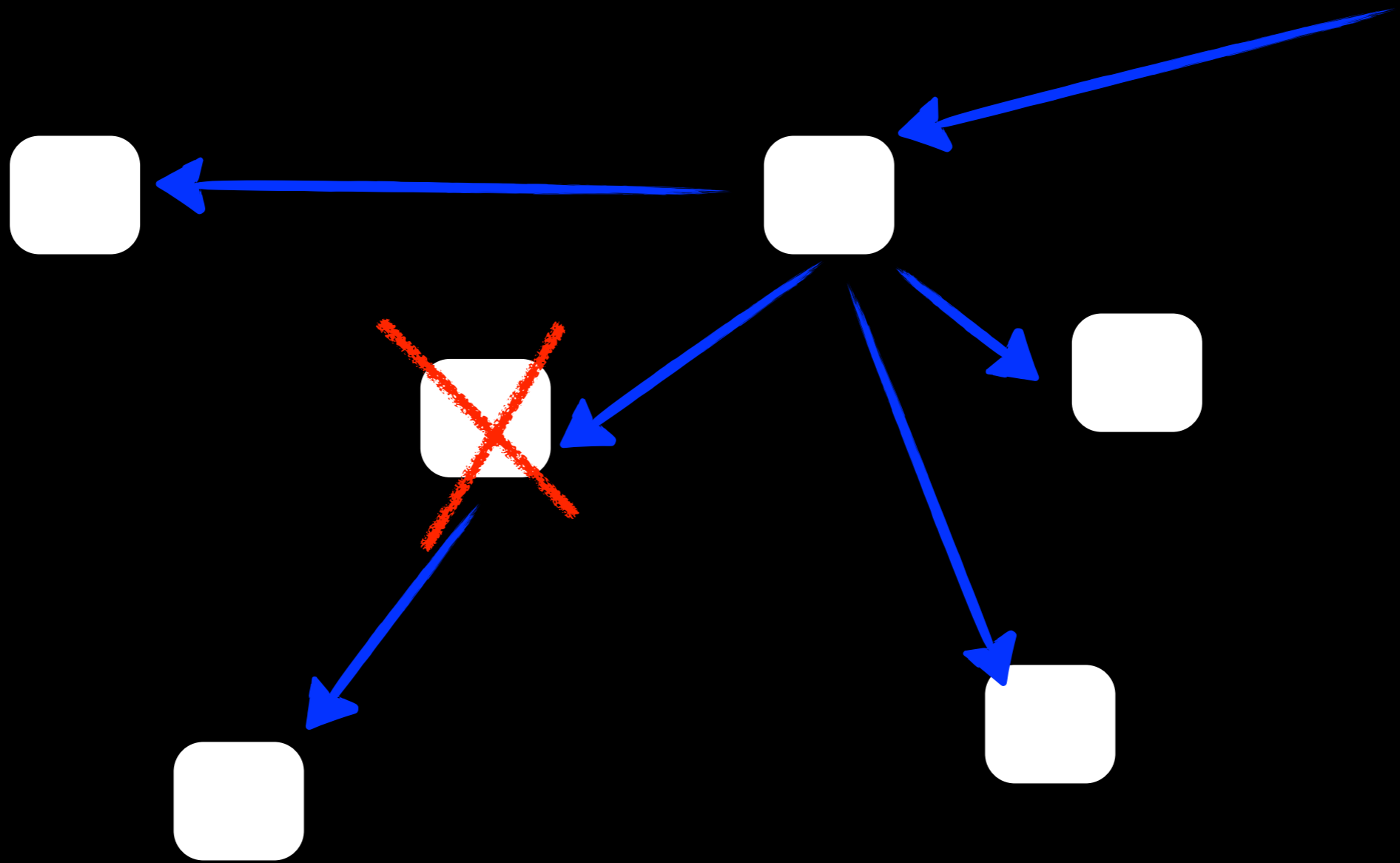


#gotoaar

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UP?



UP?

DOWN?

Number >> Size



#gotoaar

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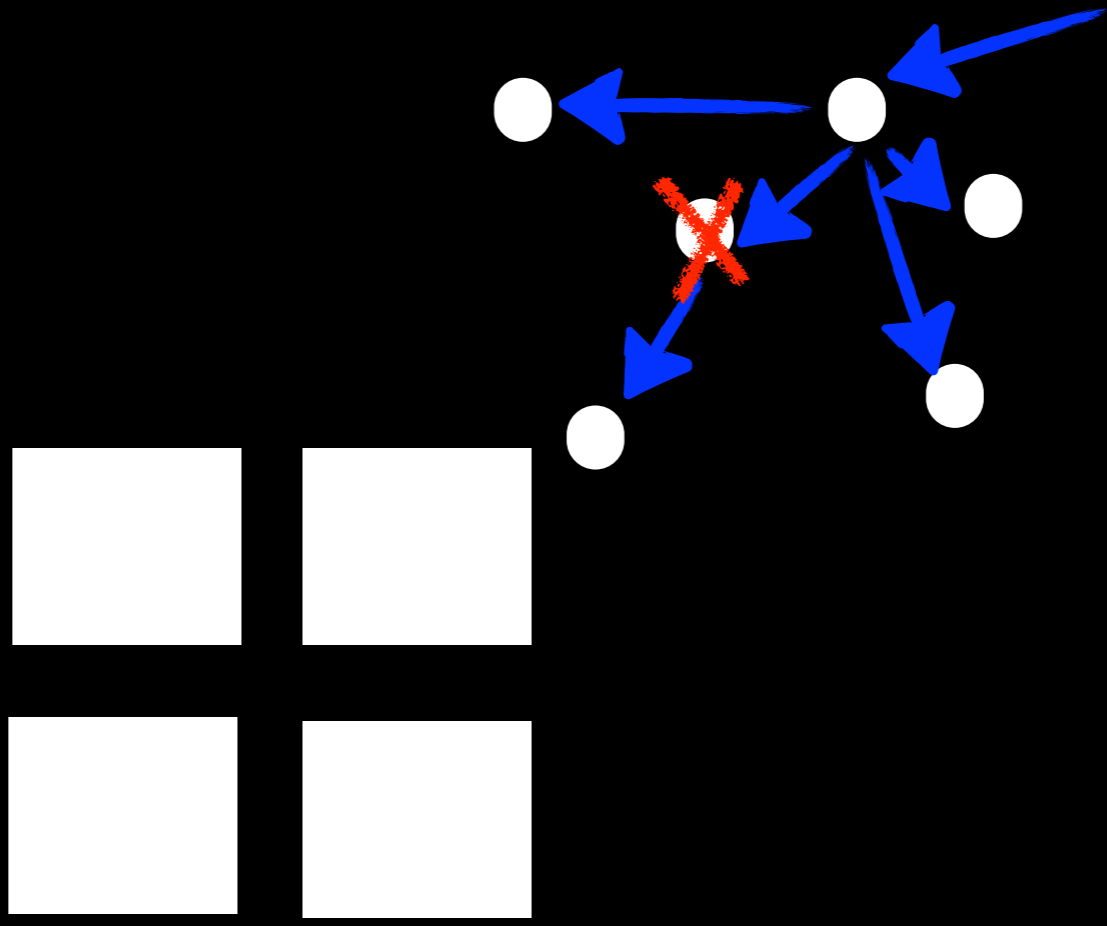
Monday, 30 September 13





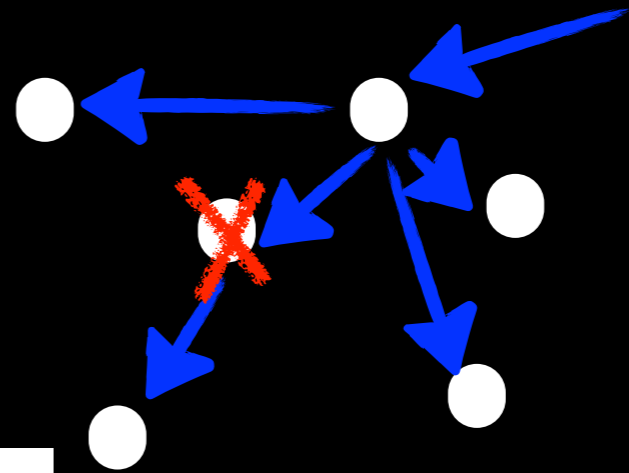
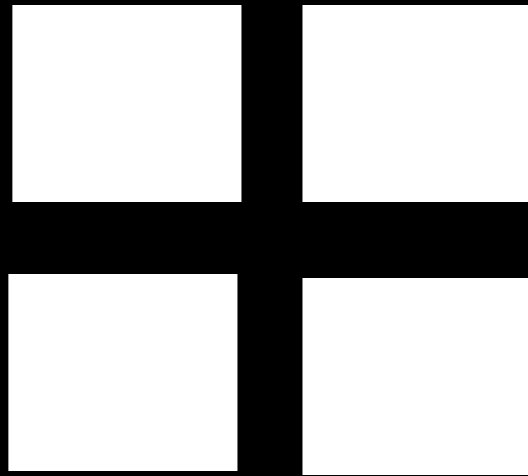
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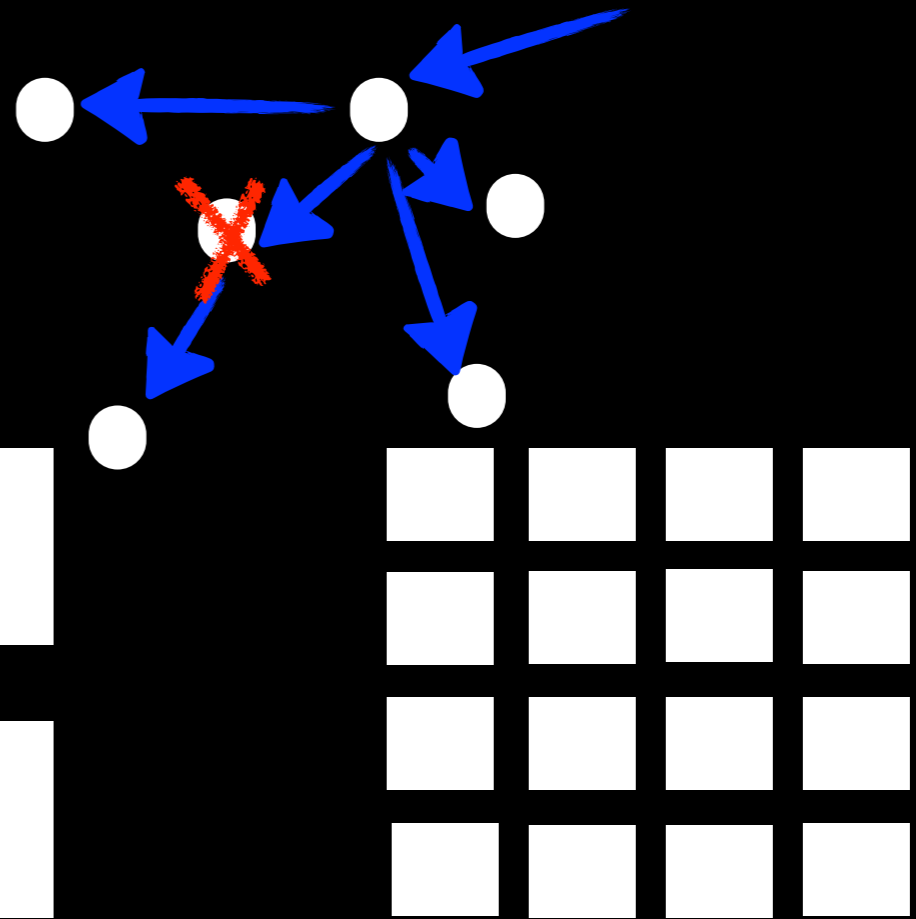
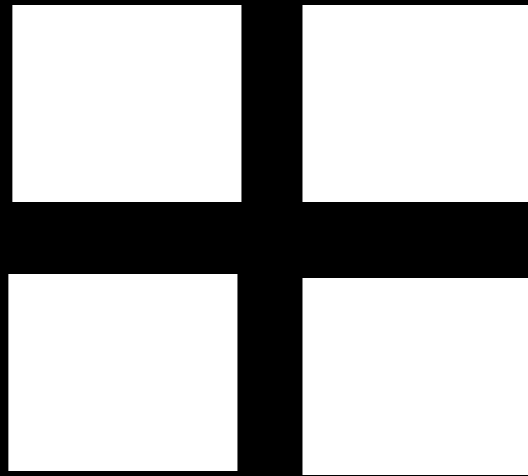
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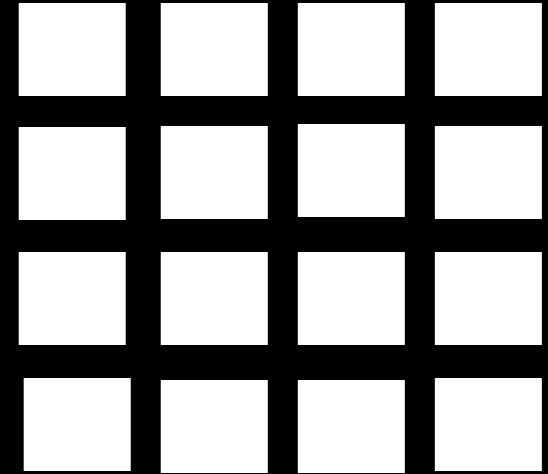
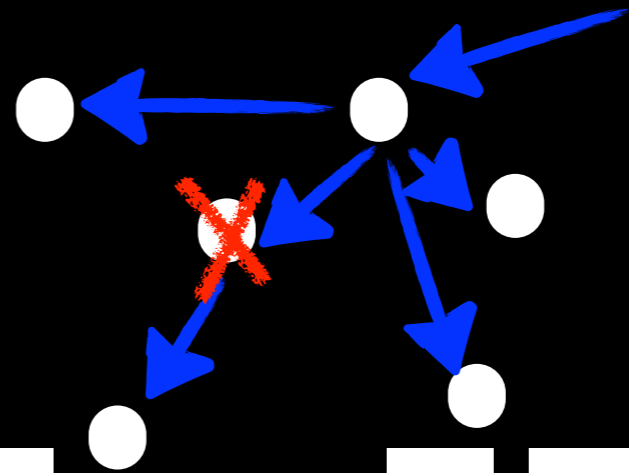
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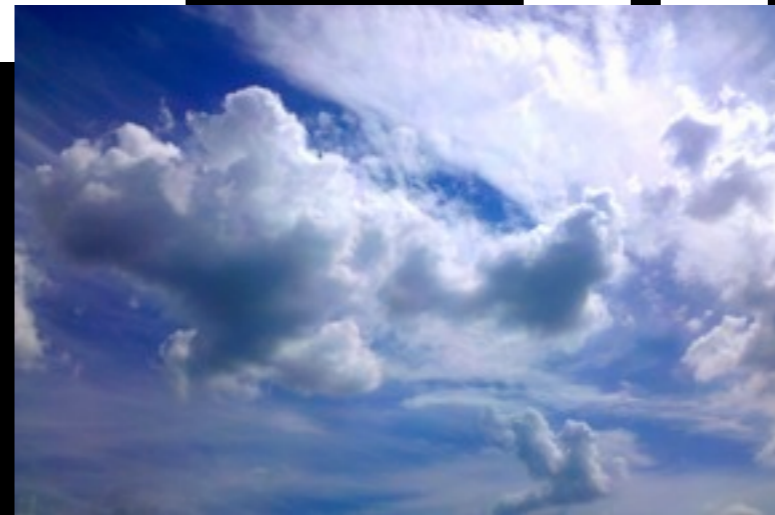
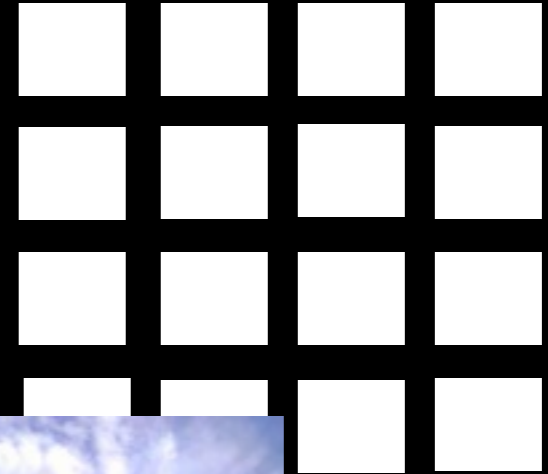
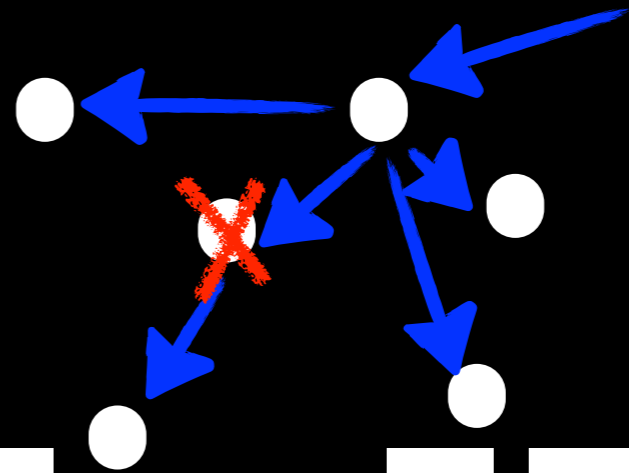
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# Summary

- Identify your bounded contexts
- Understand the cost of change - and do just enough up front thinking!
- This is an incremental journey - you won't get it right first time
- While size is important, number of services is often the limiting factor

# Thanks!

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@samnewman

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