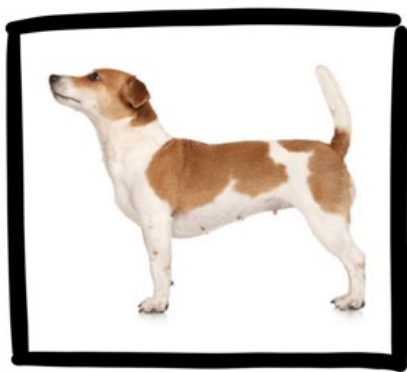
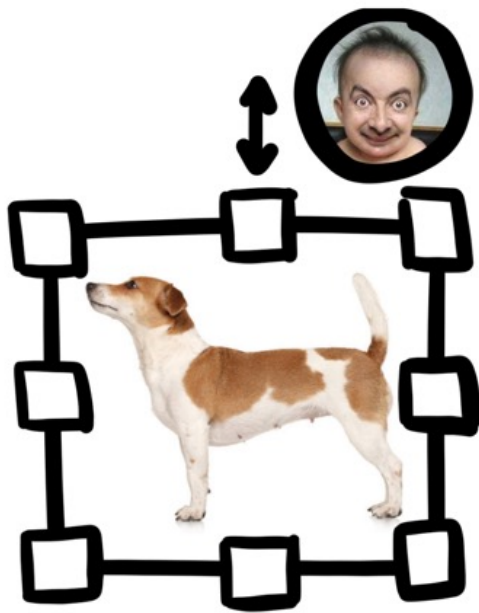
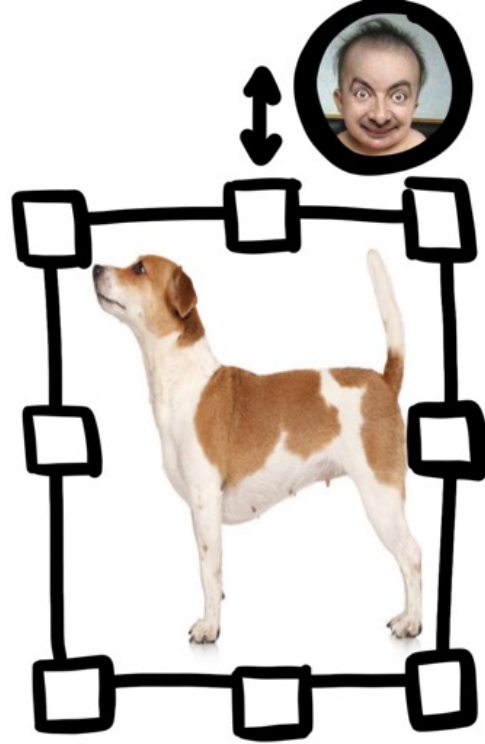


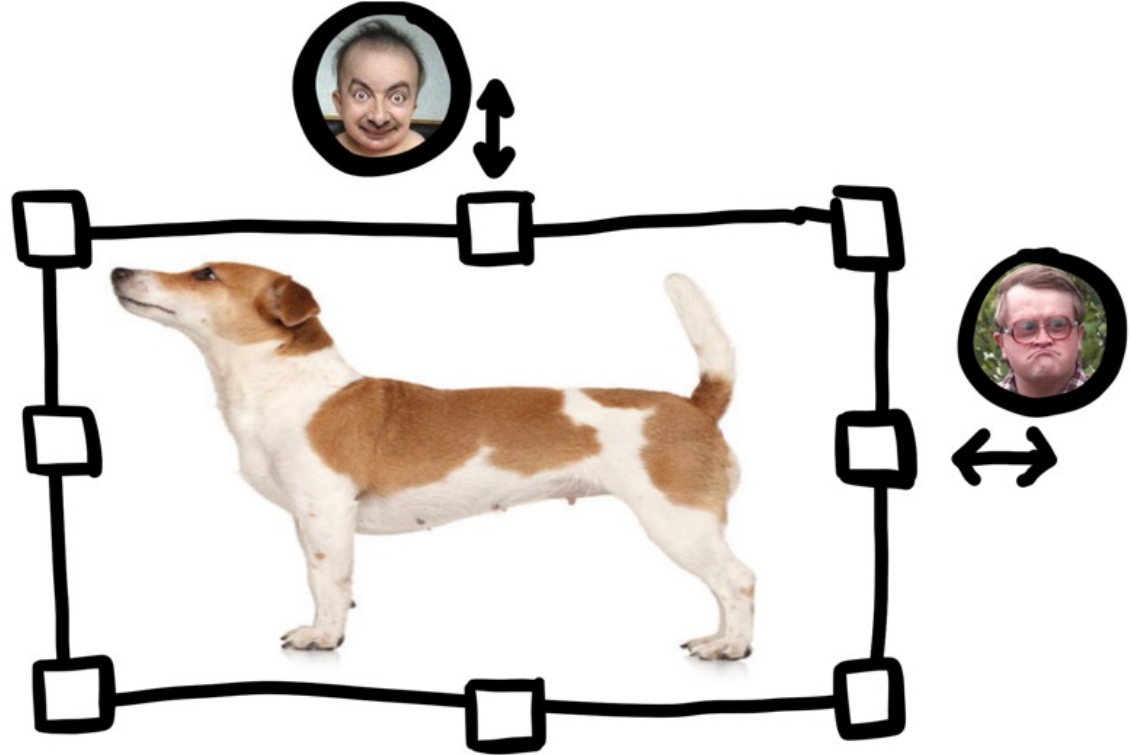
Client  
and  
Server  
need to talk

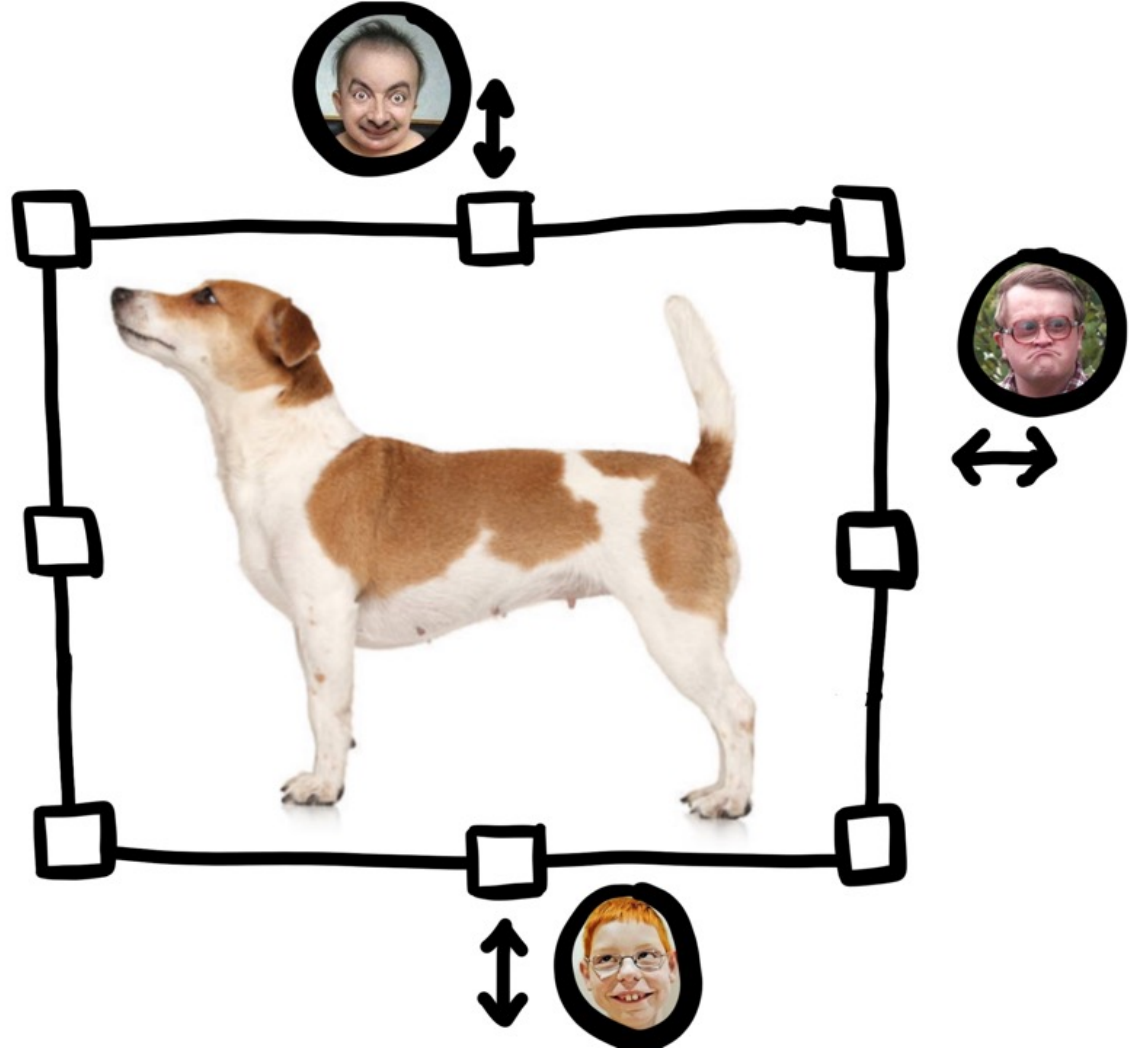
by @nikitonsky









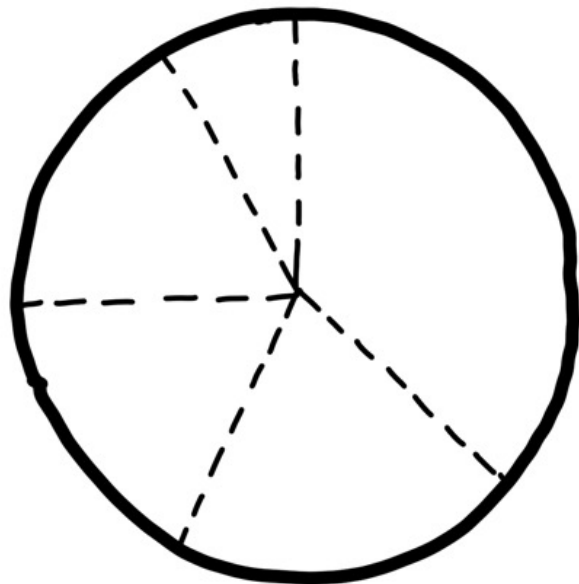


how hard is it to build

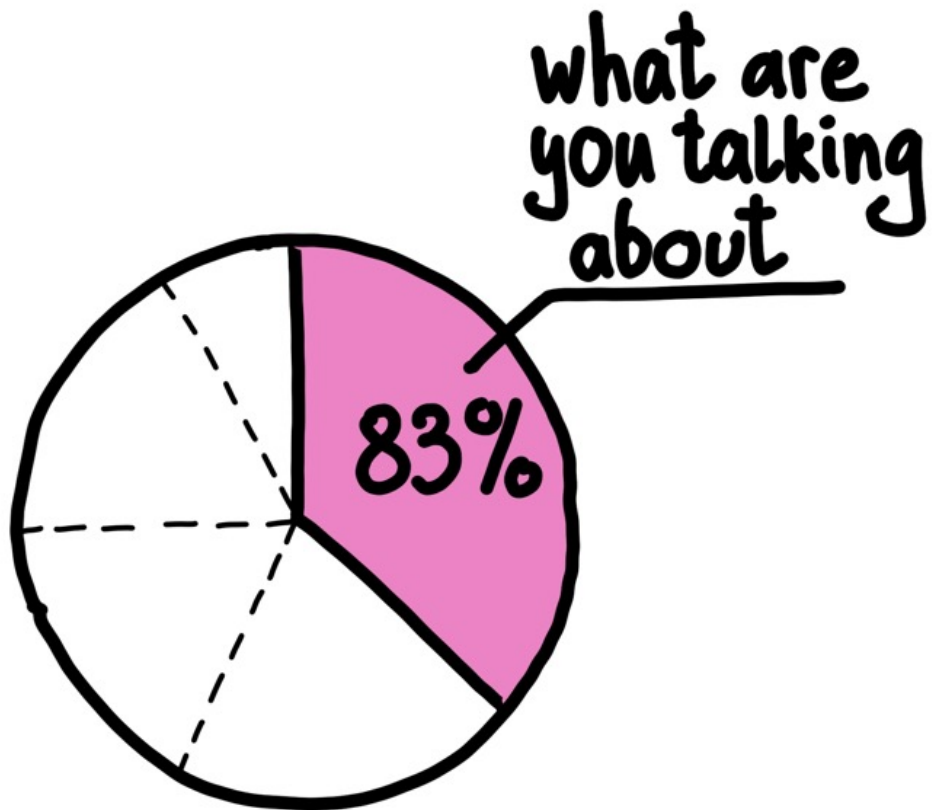
REACTIVE 

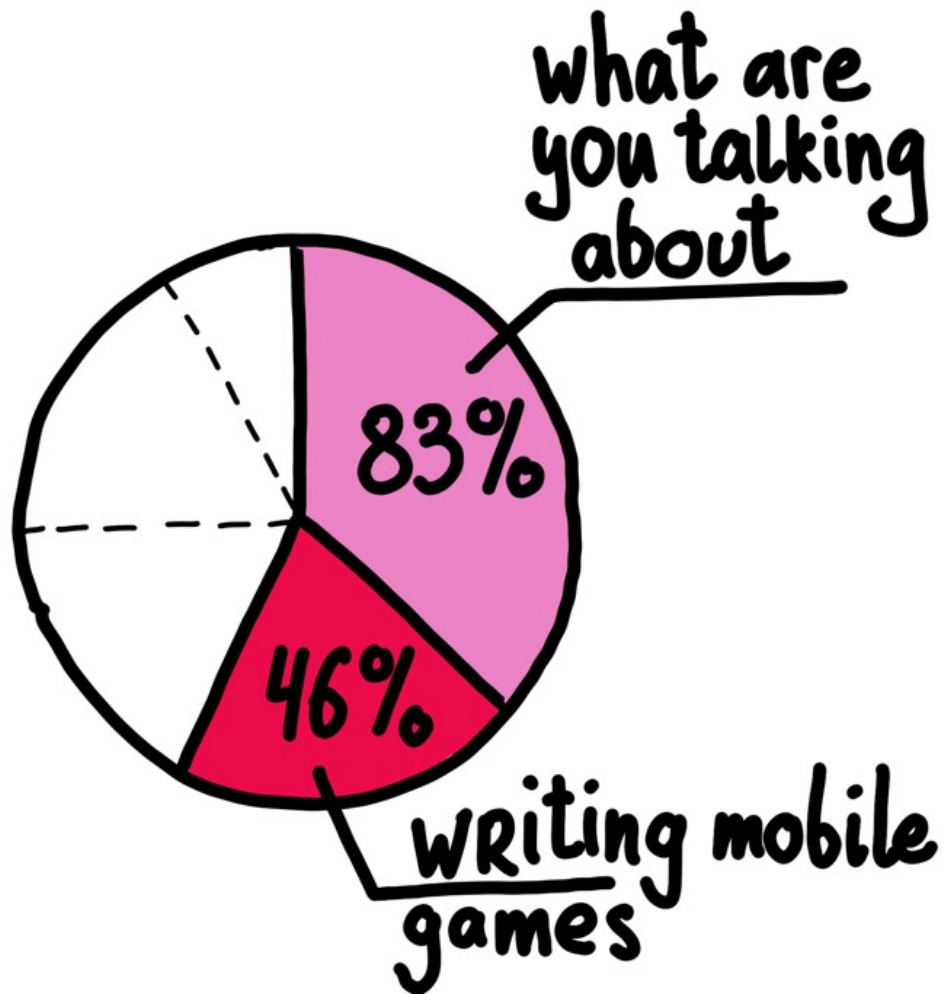
COLLAB  RATIVE

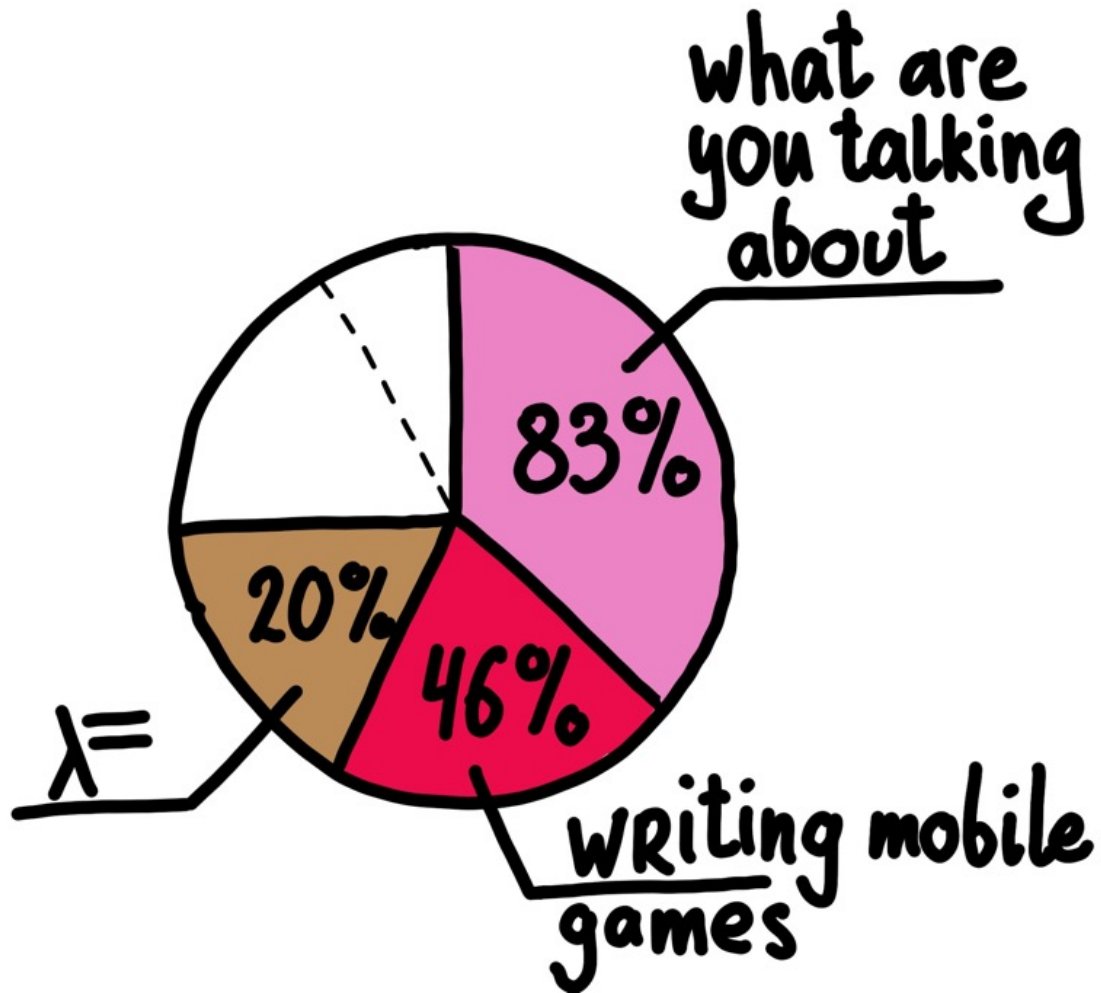
 WEB  
APPS ?





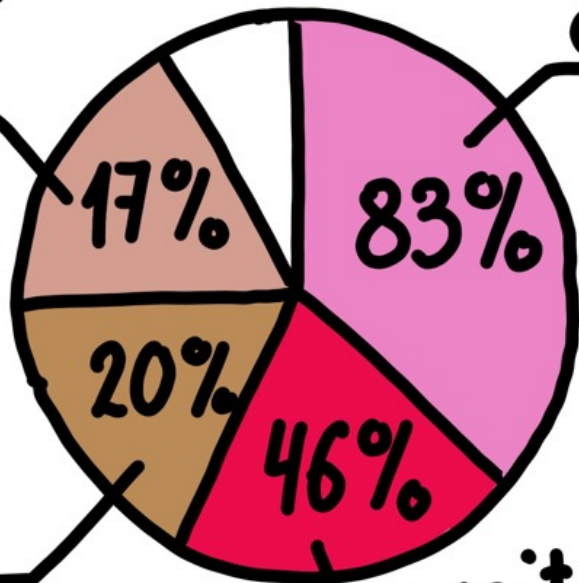








SOUNDS  
HARD



what are  
you talking  
about

$\lambda =$

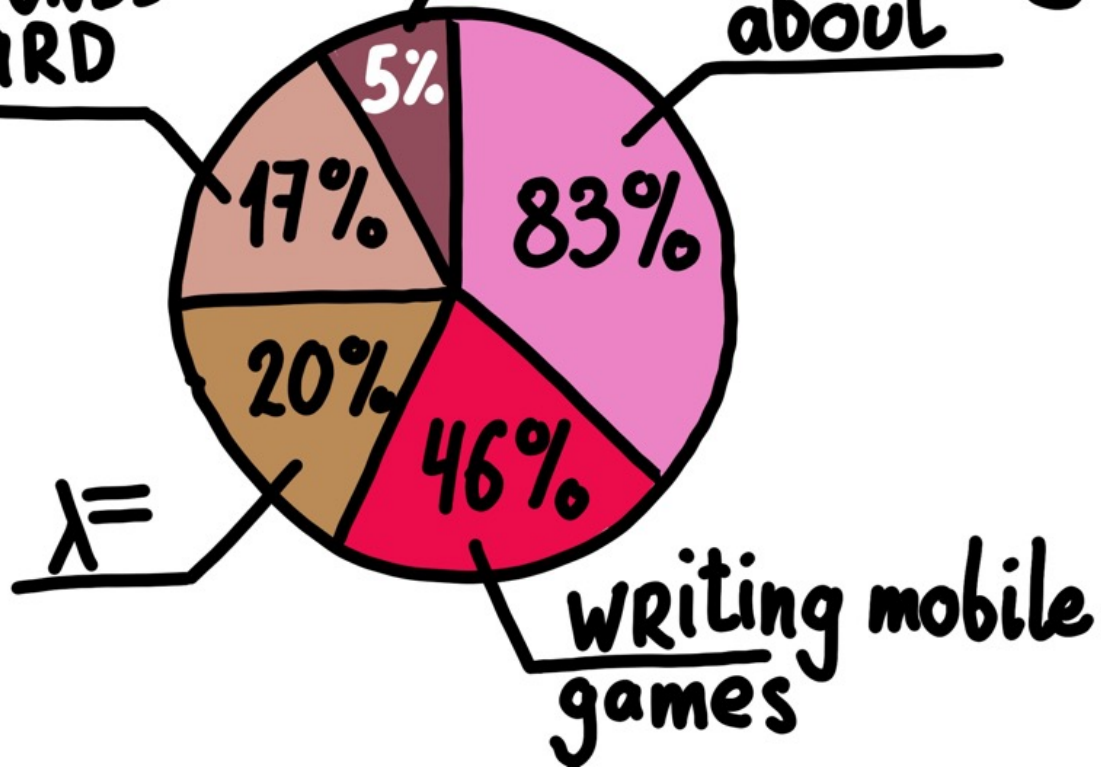
writing mobile  
games



SOUNDS  
HARD

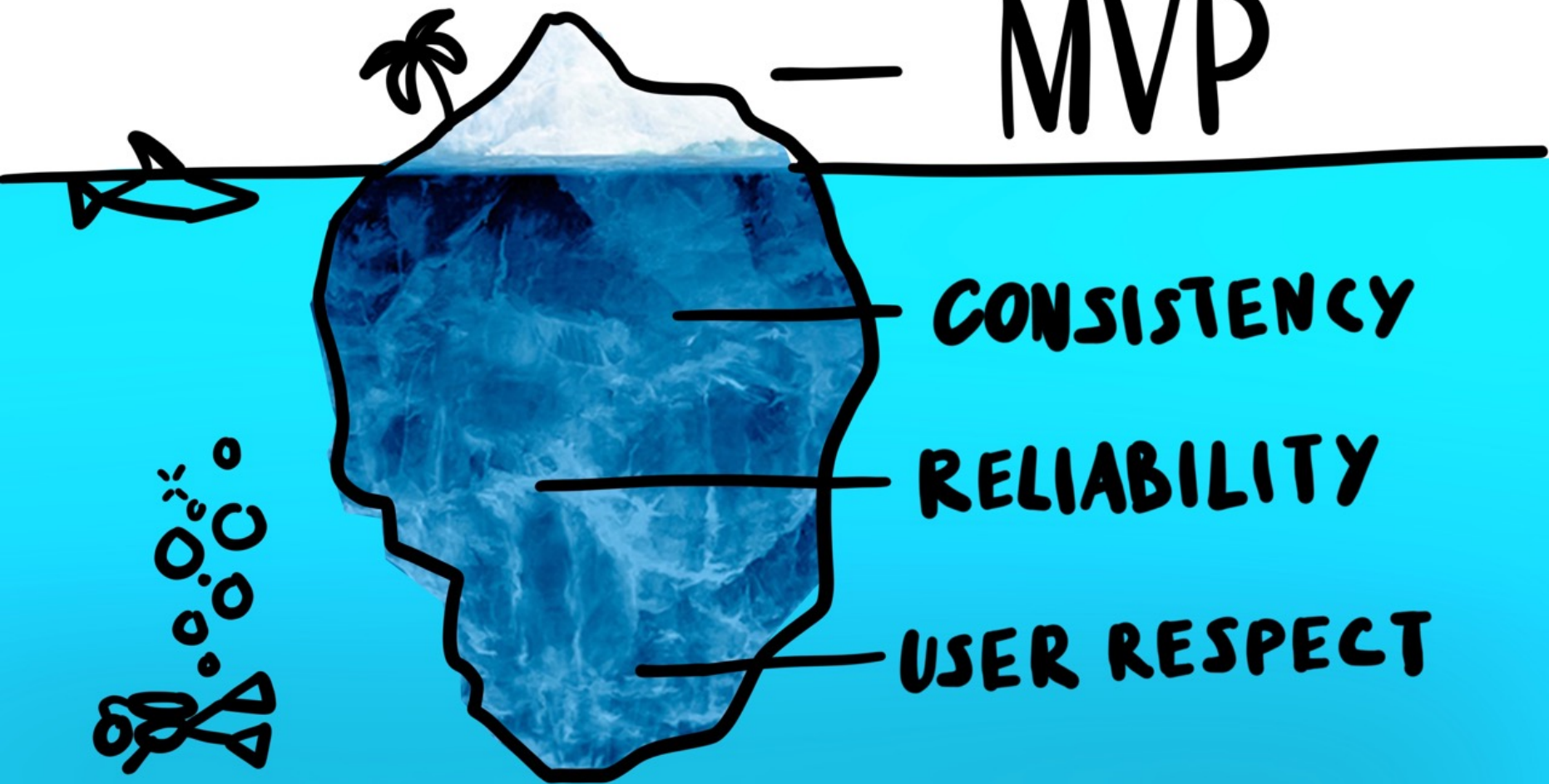
SEEMS EASY  
BUT IS \*\*\*  
Hard

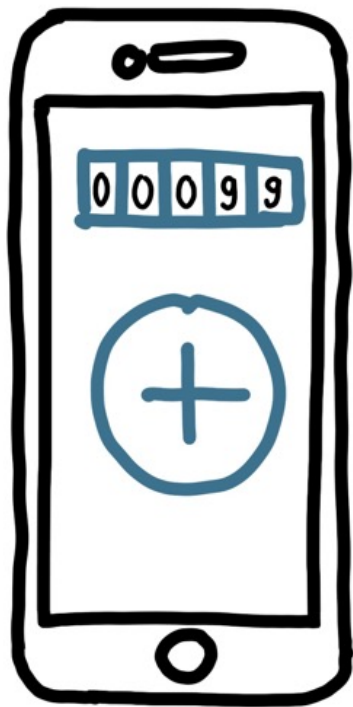
what are  
you talking  
about



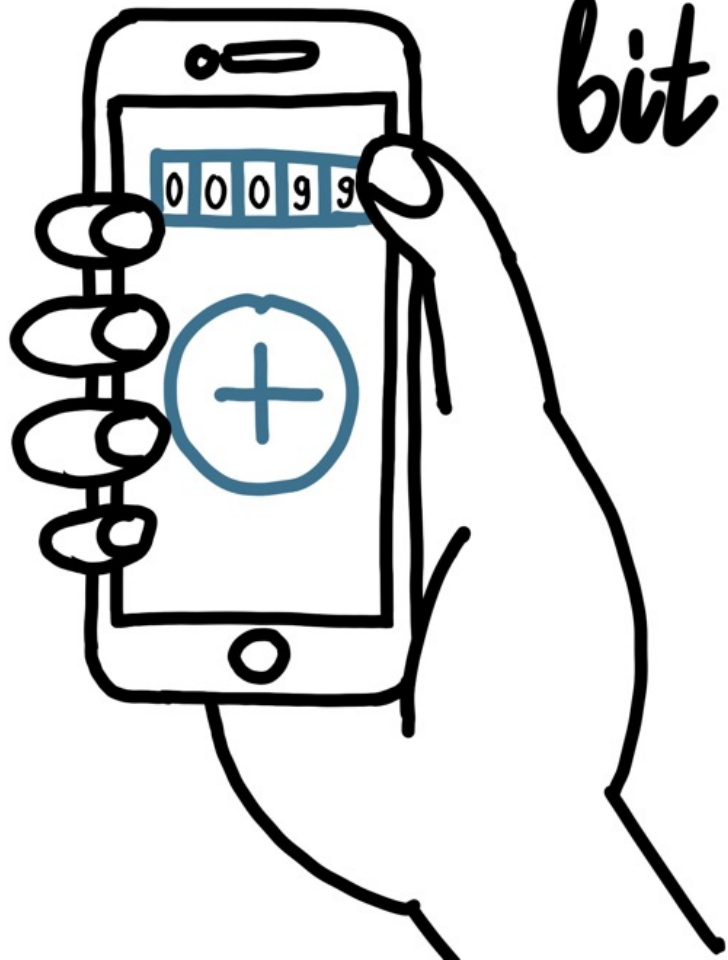


# MVP





SIMPLE  
COLLABORATIVE  
COUNTER



*bit.ly/  
reactive2017*



TRANSPORT



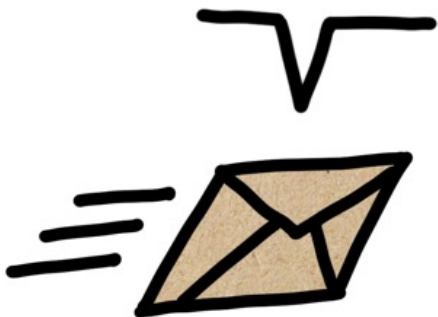
onClick:

```
{set_value: 77}
```



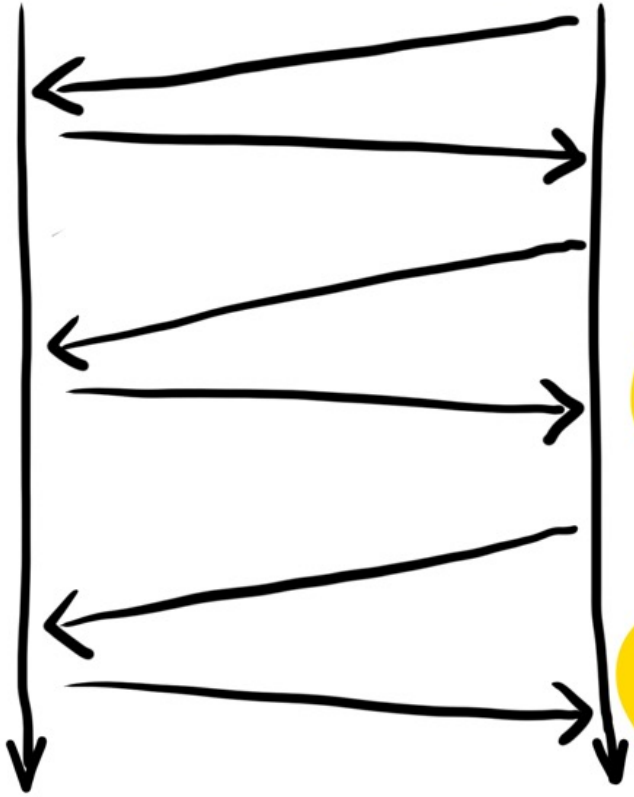
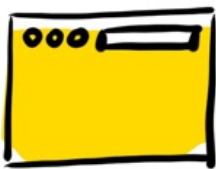
push:

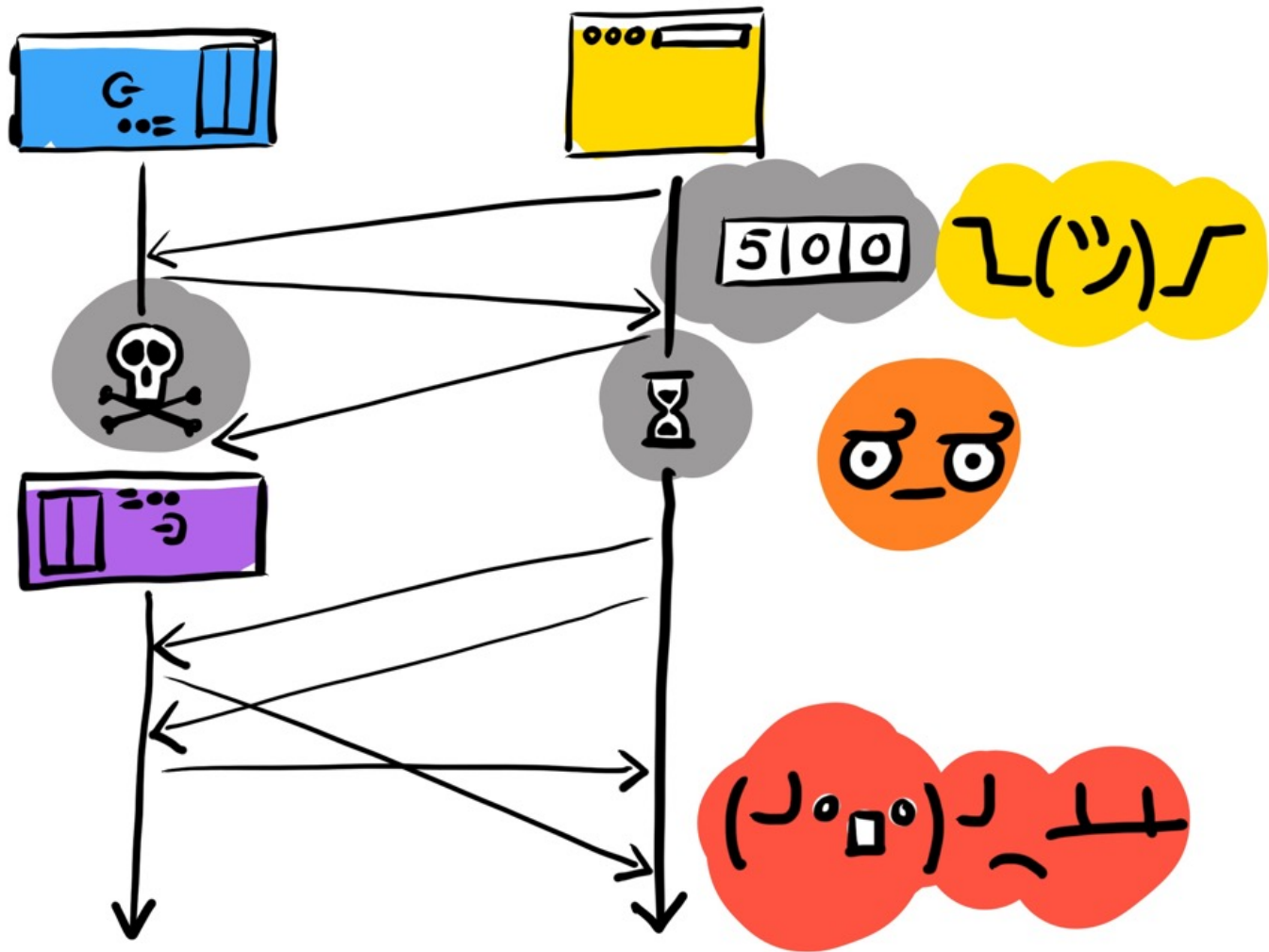
{new\_value: 77}





**XMLHttpRequest**  
**Fetch**  
**WebSockets**  
**GraphQL**





error handling

retries

subscription  
negotiation

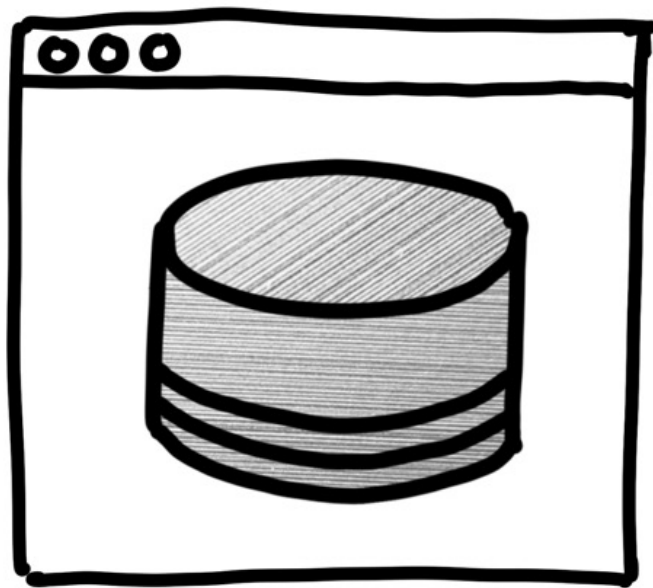
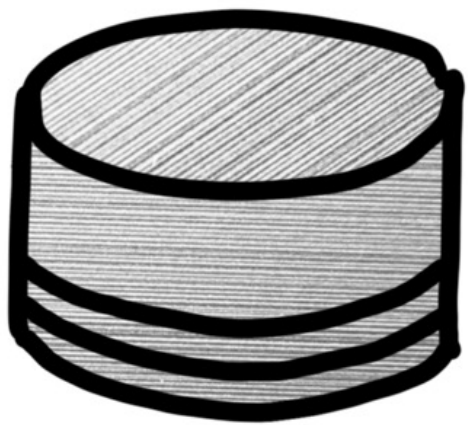


out-of-order  
responses

races

♡ beats

connection  
management



Data sync is not an operation



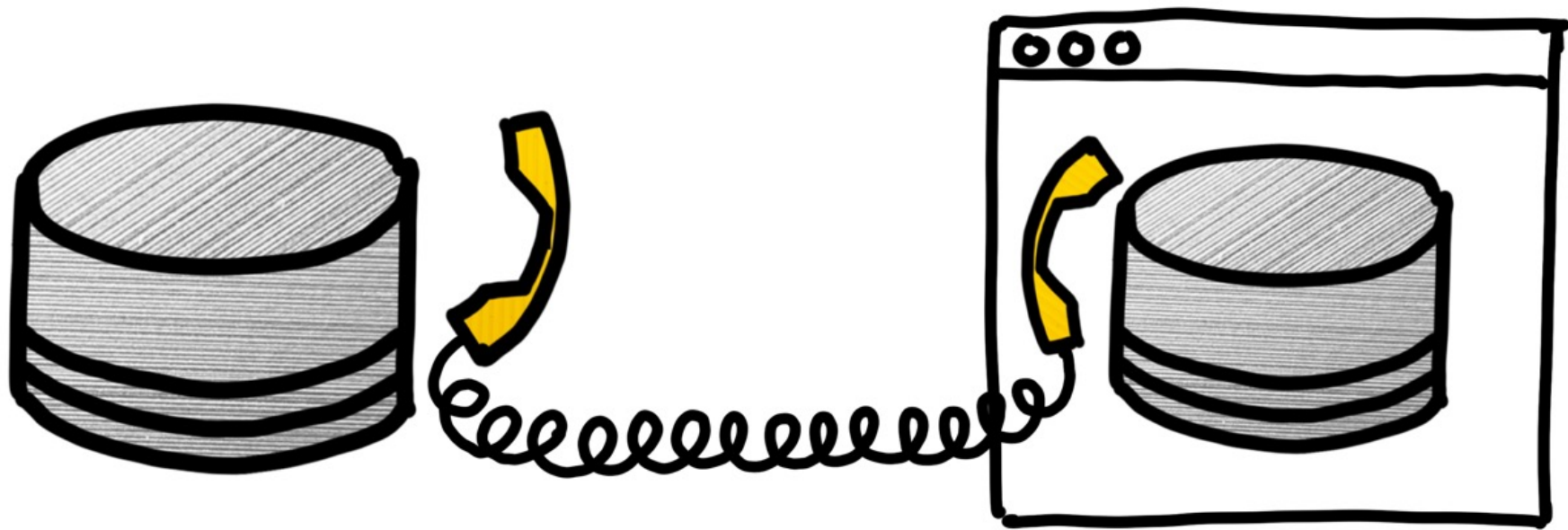
DATA SYNC

IS

a C   RDINATED

SUPERVISED

PROCESS



**STORAGE-to-STORAGE**

operations

~~operations~~

SUBSCRIPTIONS

~~operations~~

SUBSCRIPTIONS

imperative

~~operations~~

SUBSCRIPTIONS

~~imperative~~

DECLARATIVE

RELAY

APOLLO



METEOR



REALM



FIREBASE



GUN.JS



POUCH DB



HORIZON

# DATA STRUCTURES







Data  
IS SUBJECTIVE

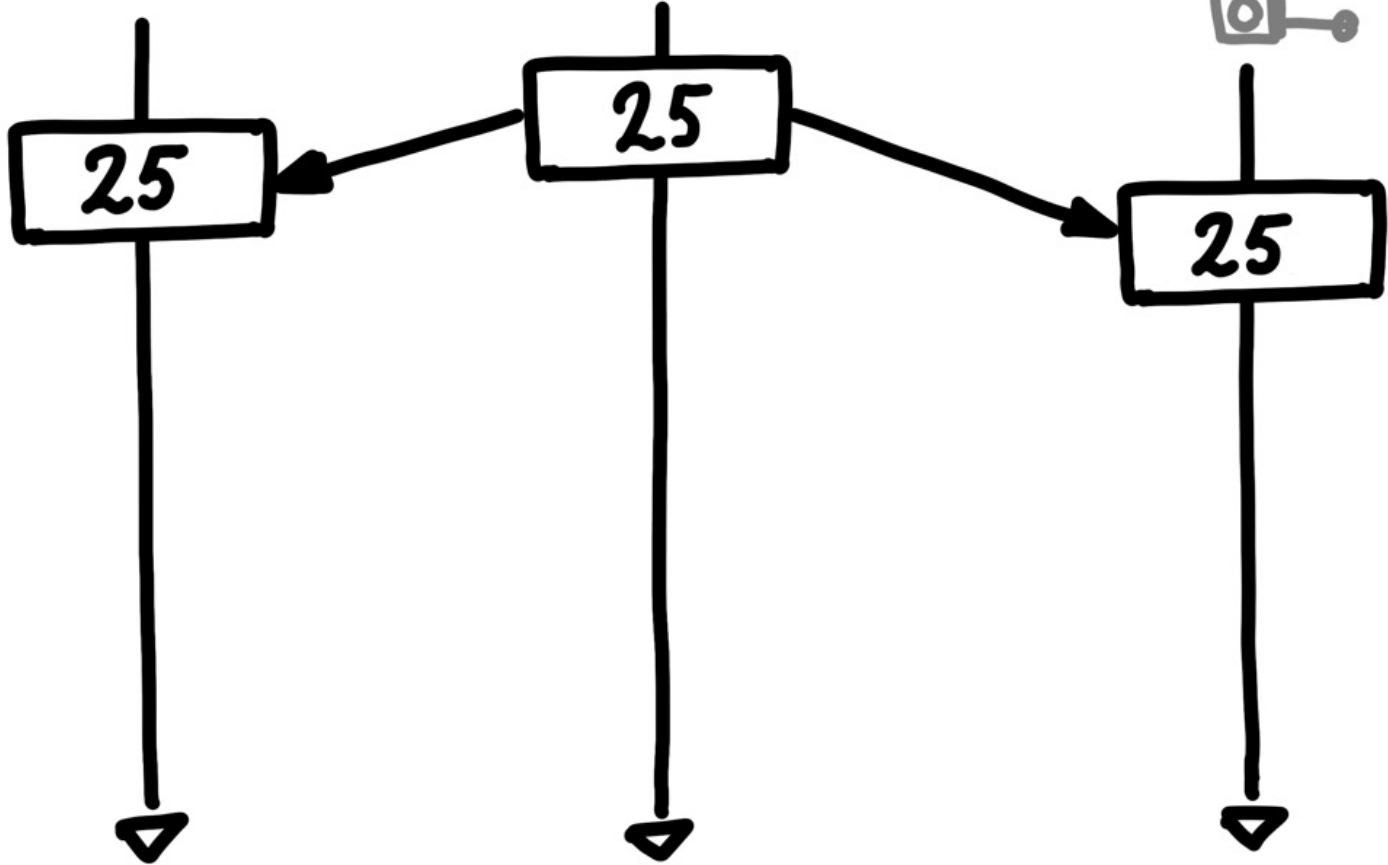


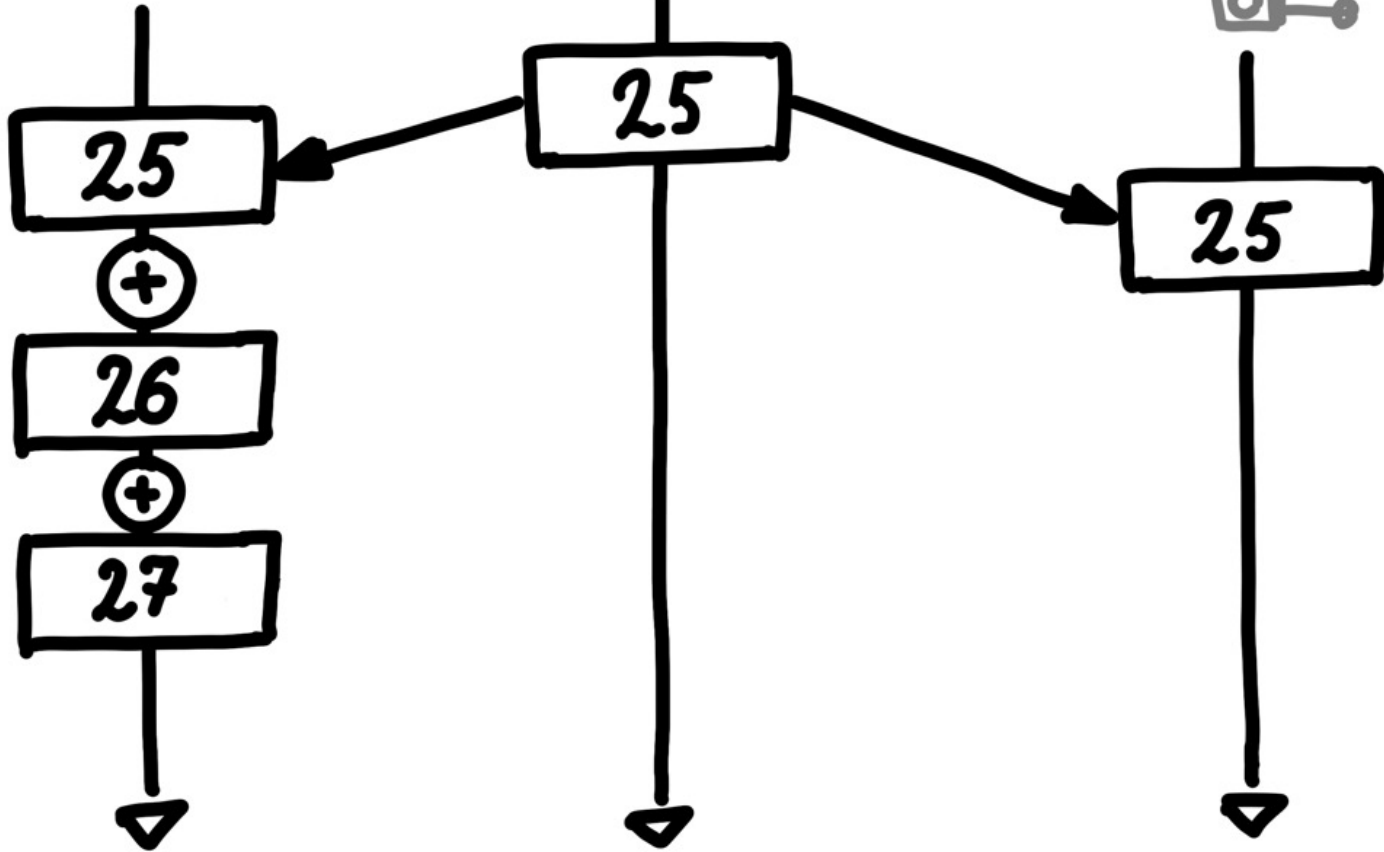


25

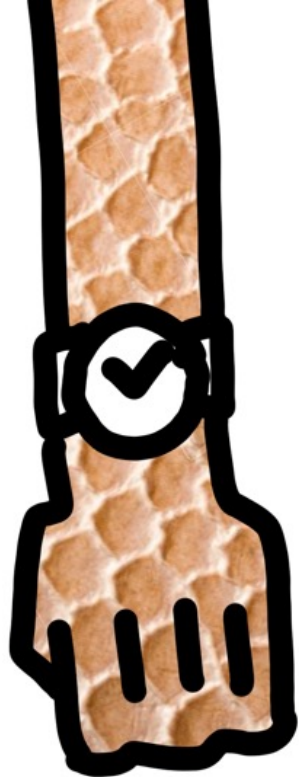
25

25





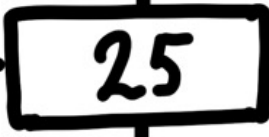
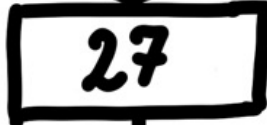




time



**IS SUBJECTIVE**



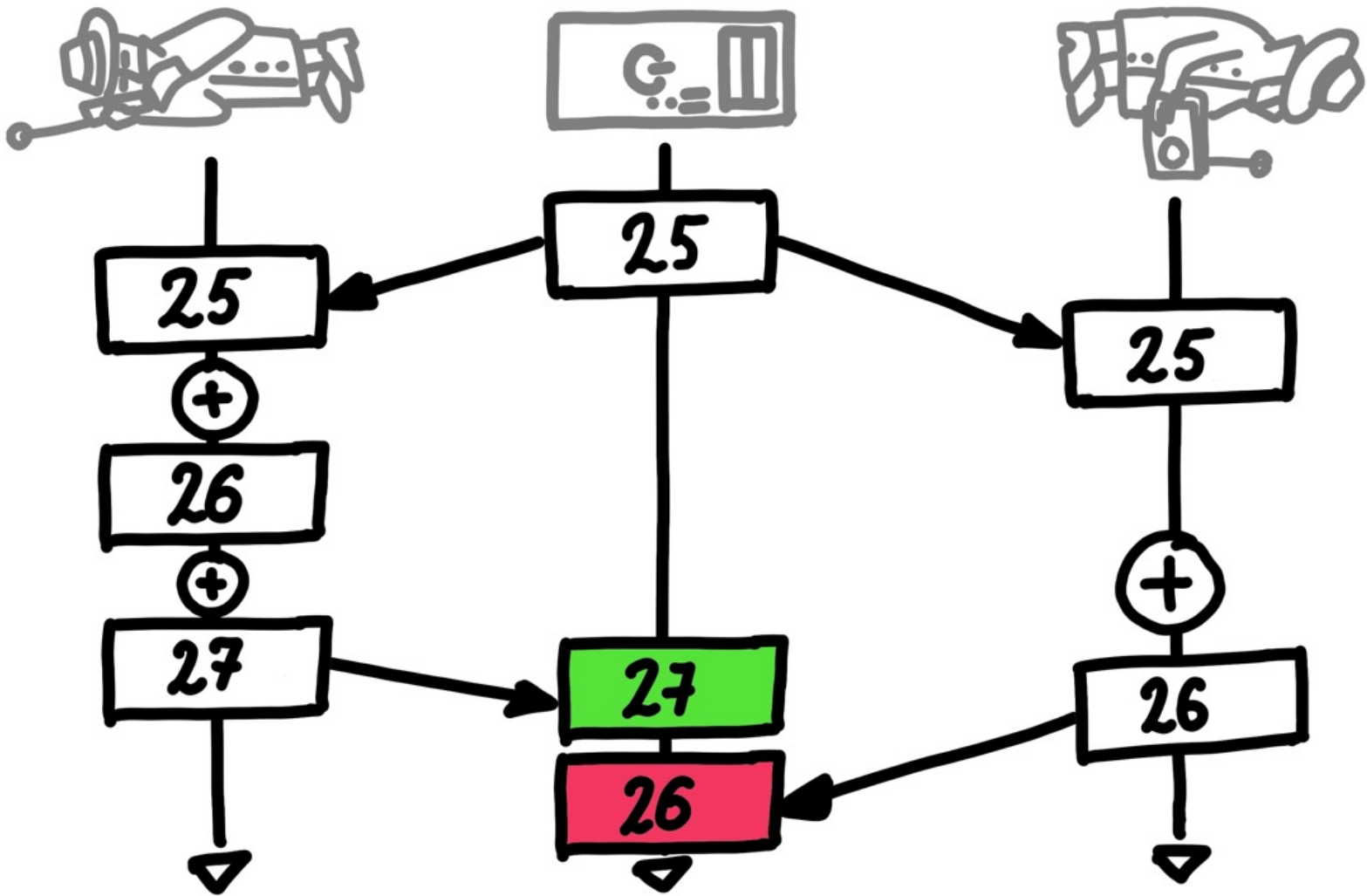
25



25











Keep track of everything



# MVCC

{ value: 33,  
version: 7 }

# COMPARE & SET

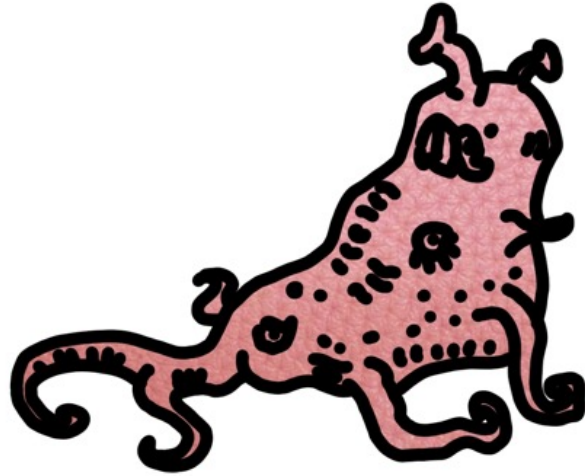
```
{ update: { value: 26,  
           version: 8 }  
last_seen: { value: 25,  
            version: 7 } }
```



NEVER  
TRUST  
CLOCK

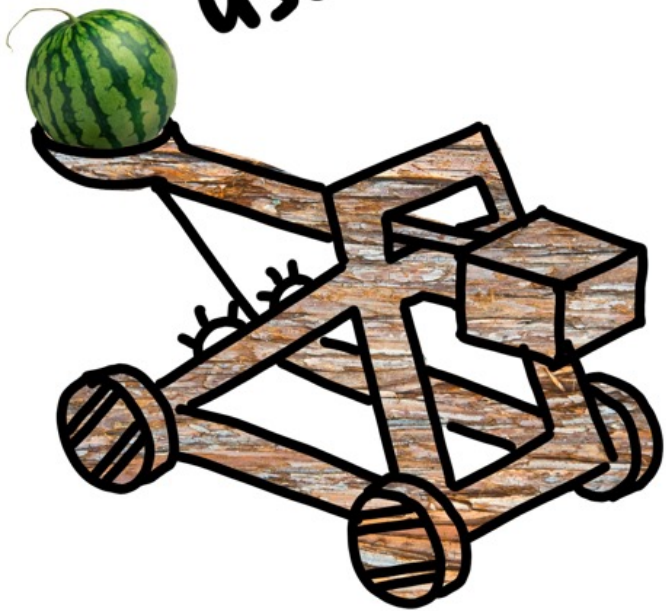






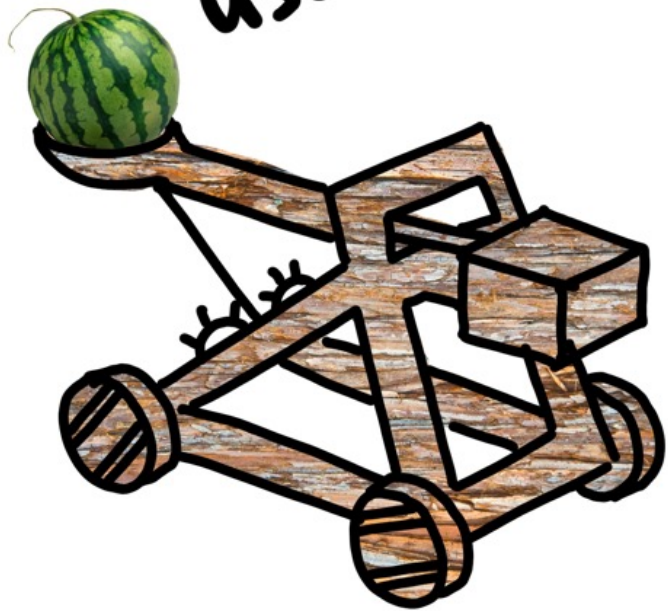
Normalize your data

use small atomic updates





use small atomic updates



**KEEP**



**REACTIVE**

#HEADER

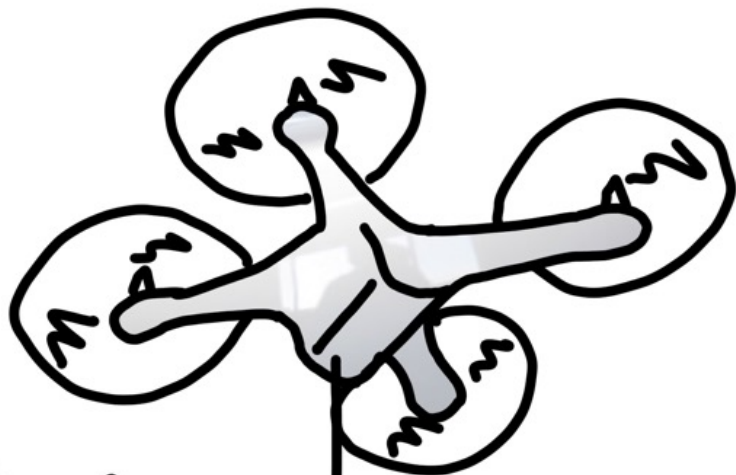


you duck! |



No, you duck! |





don't get hyped over offline

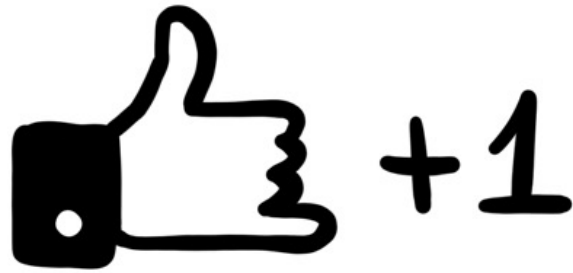




Would you like  
to resolve  
**700** conflicts?

BEGIN  $\frac{1}{700}$  >>

*Non-conflicting updates*



LET'S  $\Sigma$  IT UP



declarative  
reactive



ANNOTATED  
ACCOUNTED  
STABLE

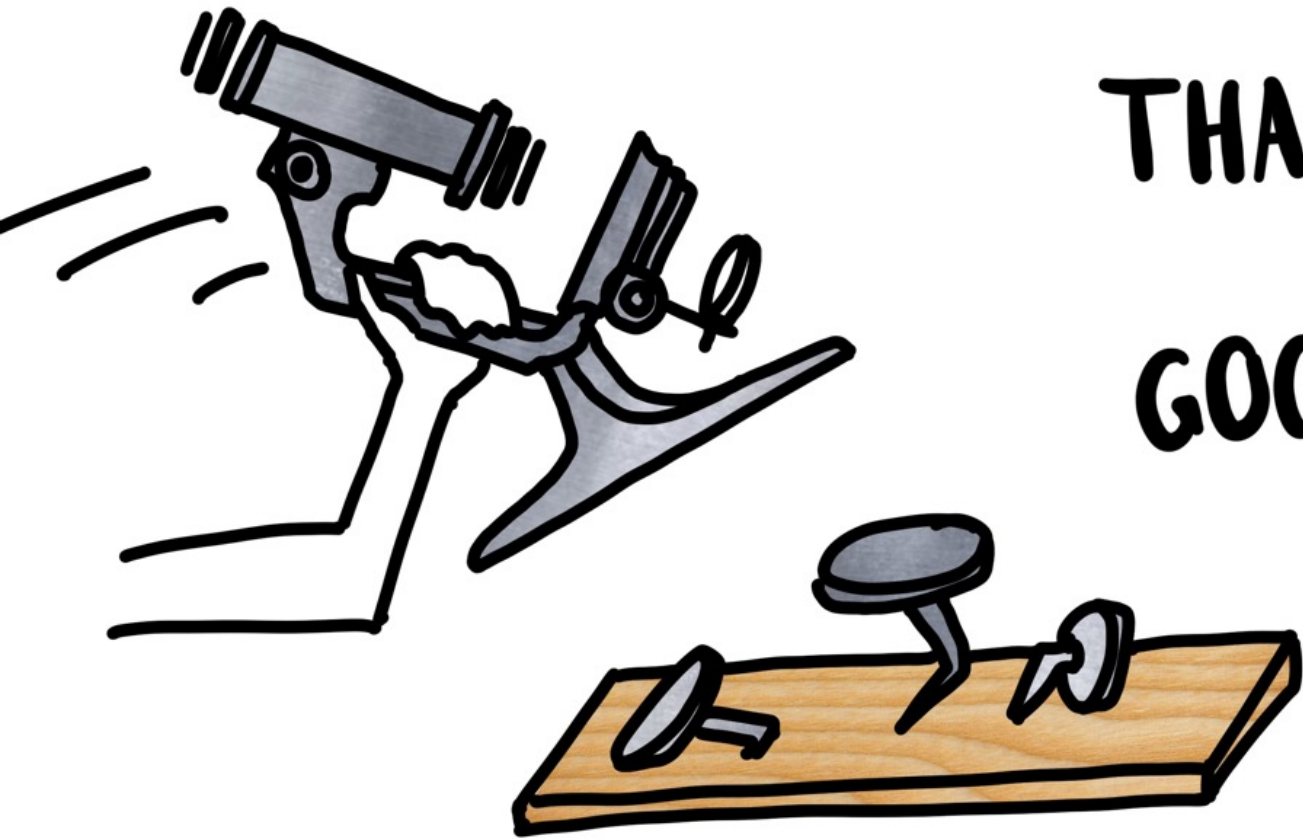




OFFLINE



NO OFFLINE



THANK YOU  
&  
GOOD LUCK