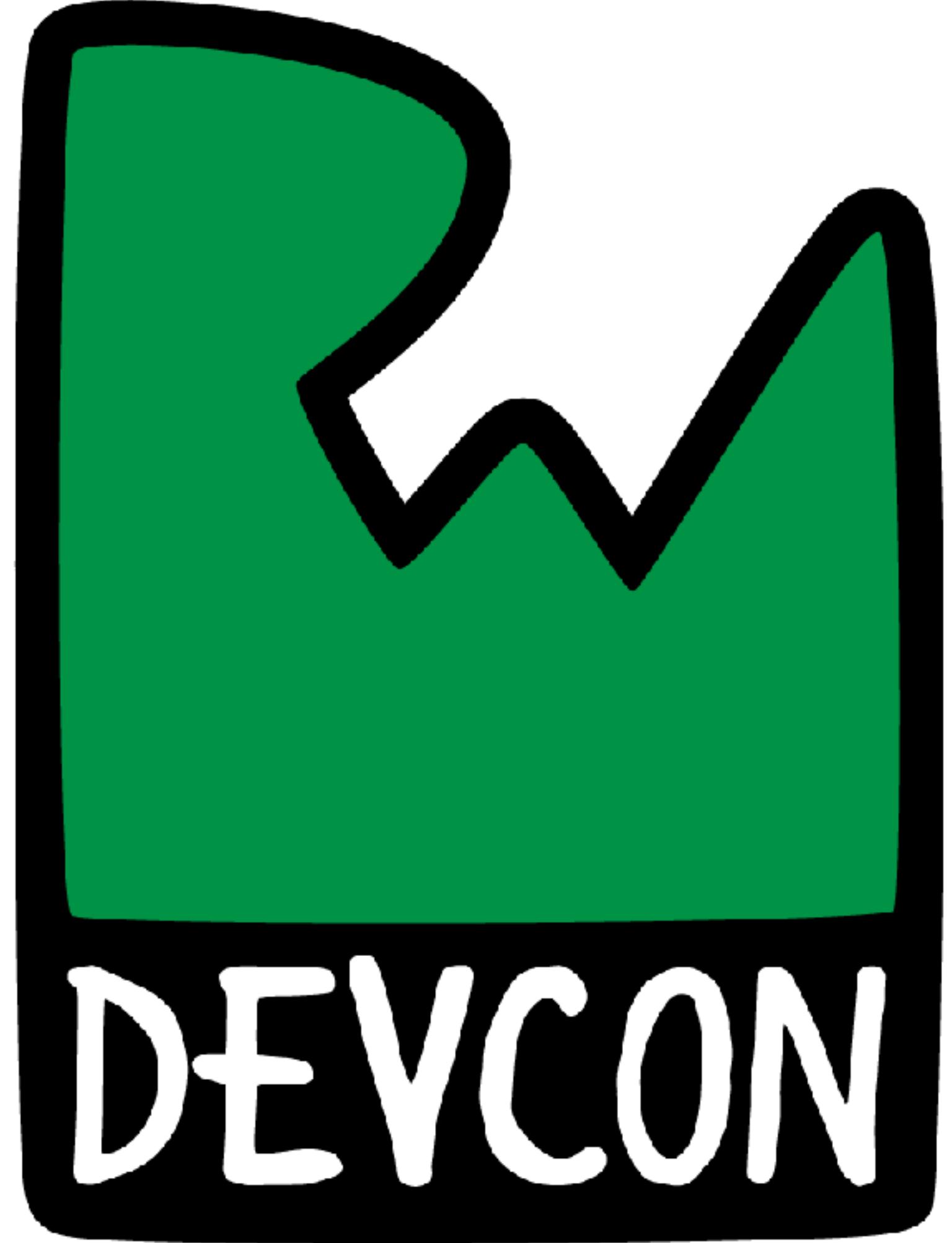


# Session 4: Cloning Netflix



RESTFUL APIs IN MOYA



Welcome to raywenderlich.com

In order to use the app and access video playback, please log in with your raywenderlich.com account

Login



R  
W

1 API  
MODELING

LOCAL  
CACHING



R  
W

3 CACHE  
SYNC

betamax Latest Synced Sent All Collections 200 1.53 s

Sessions Environments Default Group production Manage >

All Collections GET /api/v1/collections

Collection: First iOS App GET /api/v1/collections/91

Collection: Split View Contro... GET /api/v1/collections/7

Single Video GET /api/v1/videos/47

Viewings GET /api/v1/users/.../viewings

All Screencasts GET /api/v1/videos

Single Screencast GET /api/v1/videos/471

Category GET /api/v1/categories/3

GET https://videos.raywenderlich.com/api/v1/collections?format=course 200 OK

Description Headers URL Params Body Auth Options

Header Name Header Value

Authorization Token Default Group token

Add Header Name Add Header Value

Info Request Response Headers JSON Raw

Key or Index Type Value

Root 1 item

collections 61 items

Index 0 16 items

id 42 115

name A Server Side Swift with Vapor

description A Learn how to create server side Swift apps with Vapor.

duration 42 7486

pretty\_duration A 2 hours 4 minutes

featured ✓ false

released\_at A 2018-02-13T10:02:00.000Z

video\_count 42 25

production\_phase A complete

products\_cache 2 items

difficulty Ø null

created\_at A 2017-12-14T09:15:56.781Z

updated\_at A 2018-02-20T14:02:00.608Z

free ✓ false

attachments 8 items

categories 1 item

Index 1 16 items

id 42 85

name A Beginning App Asset Design

description A Introduction to designing and using visual assets for your app...

duration 42 8445

pretty\_duration A 2 hours 20 minutes

featured ✓ false

released\_at A 2018-01-23T15:00:00.000Z

video\_count 42 23

production\_phase A complete

products\_cache 2 items

difficulty Ø null

HTTP | ↗ | 🔒

2 Authorization: Token eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiI3OGQ50TM4Mi0xMWYzLTExZTYtYjExYS1iZmU0MTlUNWFjZGYiLCJpYXQiOjE1MTkxNDY1NDF9.hUr8delIk1iBRDqeI02qhrNzL0kuQQMuMmuBq9iHcwg

3 Host: videos.raywenderlich.com

4 Connection: close

5 User-Agent: Paw/3.1.5 (Macintosh; OS X/10.13.3) GCDHTTPRequest

+ | Filter by KeyPath

Sent All Collections  
GET /api/v1/collections

200  
1.53 s

Manage >

All Collections  
GET /api/v1/collections

Collection: First iOS App  
GET /api/v1/collections/91

Collection: Split View Contro...  
GET /api/v1/collections/7

Single Video  
GET /api/v1/videos/47

Viewings  
GET /api/v1/users/.../viewings

All Screencasts  
GET /api/v1/videos

Single Screencast  
GET /api/v1/videos/471

Category  
GET /api/v1/categories/3

HTTP |  | 

0iI30GQ50TM4Mi0xMWYzLTExZTYtDF9.hUr8delIk1iBRDqeI02qhrNz

4 connection: close  
5 User-Agent: Paw/3.1.5 (Macintosh; OS X/10.13.3) GCDHTTPRequest  
6  
7  
8  
9

GET https://videos.raywenderlich.com/api/v1/collections?format=course  
200 OK

Info Request Response  
Headers JSON Raw

Key or Index Type Value

Root

collections

Index 0

- id: 42, 115
- name: A, Server Side Swift with Vapor
- description: A, Learn how to create server side Swift apps with Vapor.
- duration: 42, 7486
- pretty\_duration: A, 2 hours 4 minutes
- featured: ✓, false
- released\_at: A, 2018-02-13T10:02:00.000Z
- video\_count: 42, 25
- production\_phase: A, complete

products\_cache

- difficulty: Ø, null

created\_at: A, 2017-12-14T09:15:56.781Z

updated\_at: A, 2018-02-20T14:02:00.608Z

free: ✓, false

attachments

- categories

Index 1

- id: 42, 85
- name: A, Beginning App Asset Design
- description: A, Introduction to designing and using visual assets for your app...
- duration: 42, 8445
- pretty\_duration: A, 2 hours 20 minutes
- featured: ✓, false
- released\_at: A, 2018-01-23T15:00:00.000Z
- video\_count: 42, 23
- production\_phase: A, complete

products\_cache

- difficulty: Ø, null

 Filter by KeyPath

Sent All Collections  
GET /api/v1/collections

200  
1.53 s

Sessions Environments  
Default Group production  
Manage »

All Collections  
GET /api/v1/collections

Collection: First iOS App  
GET /api/v1/collections/91

Collection  
GET />>

Single  
GET /

View  
GET /

All Sessions  
GET /

Single Session  
GET /

Category  
GET /

Description Headers URL Params Body Auth Options

Header Name Header Value

Authorization Token Default Group token

Add Header Name Add Header Value

HTTP | ↗ | 🔒

2 Authorization: Token eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiI30GQ50TM4Mi0xMWYzMTEzZTYt YjExYS1iZmU0MTlUNWFjZGYiLCJpYXQiOjE1MTkxNDY1NDF9.hUr8delIk1iBRDqeI02qhrNz L0kuQQMuMmuBq9iHcwg  
3 Host: videos.raywenderlich.com  
4 Connection: close  
5 User-Agent: Paw/3.1.5 (Macintosh; OS X/10.13.3) GCDHTTPRequest

Info Request Response

Headers JSON Raw

Key or Index Type Value

Root 1 item

ide Swift with Vapor  
w to create server side Swift apps with Vapor.

4 minutes

-13T10:02:00.000Z

Index 1

created_at	A 2017-12-14T09:15:56.781Z
updated_at	A 2018-02-20T14:02:00.608Z
free	✓ false
attachments	8 items
categories	1 item
Index 1	16 items
id	42 85
name	A Beginning App Asset Design
description	A Introduction to designing and using visual assets for your app...
duration	42 8445
pretty_duration	A 2 hours 20 minutes
featured	✓ false
released_at	A 2018-01-23T15:00:00.000Z
video_count	42 23
production_phase	A complete
products_cache	2 items
difficulty	∅ null

Filter by KeyPath

**betamax** Latest Synced

Sessions Environments  
Default Group production Manage »

All Collections GET /api/v1/collections  
Collection: First iOS App GET /api/v1/collections/91  
Collection: Split View Contro... GET /api/v1/collections/7  
Single Video GET /api/v1/videos/47  
Viewings GET /api/v1/users/.../viewings  
All Screencasts GET /api/v1/videos  
Single Screencast GET /api/v1/videos/471  
Category GET /api/v1/categories/3

Header Name Authorization Add Header Name

Key or Index

	Type	Value
Root	1 item	
collections	61 items	
Index 0	16 items	
id	42	115
name	A	Server Side Swift with Vapor
description	A	Learn how to create server side Swift apps with Vapor.
duration	42	7486
pretty_duration	A	2 hours 4 minutes
featured	✓	false
released_at	A	2018-02-13T10:02:00.000Z
video_count	42	25
production_phase	A	complete
products_cache	2 items	
difficulty	Ø	null
created_at	A	2017-12-14T09:15:56.781Z
updated_at	A	2018-02-20T14:02:00.608Z
free	✓	false
attachments	8 items	
categories	1 item	
Index 1	16 items	
id	42	85
name	A	Beginning App Asset Design
description	A	Introduction to designing and using visual assets for your app...
duration	42	8445
pretty_duration	A	2 hours 20 minutes
featured	✓	false
released_at	A	2018-01-23T15:00:00.000Z
video_count	42	23
production_phase	A	complete

```

2 Authorization: Token eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJleHAiOjE1NjMwOTQyNjMsImV4cCI6MTU2MzA5ODI2M30.L0kuQQMuMmuBq9iHcwg
3 Host: videos.raywenderlich.com
4 Connection: close
5 User-Agent: Paw/3.1.5
6
7
8
9
  
```

# MOYA



**network abstraction**  
**layer that sufficiently**  
**encapsulates** making  
network requests

# PROCESS

---

- ⚙️ Create enum to specify endpoints
- ⚙️ Provide details of how to construct each request
- ⚙️ Make requests with a provider object
- ⚙️ Map the response to local data objects



DEMO 1



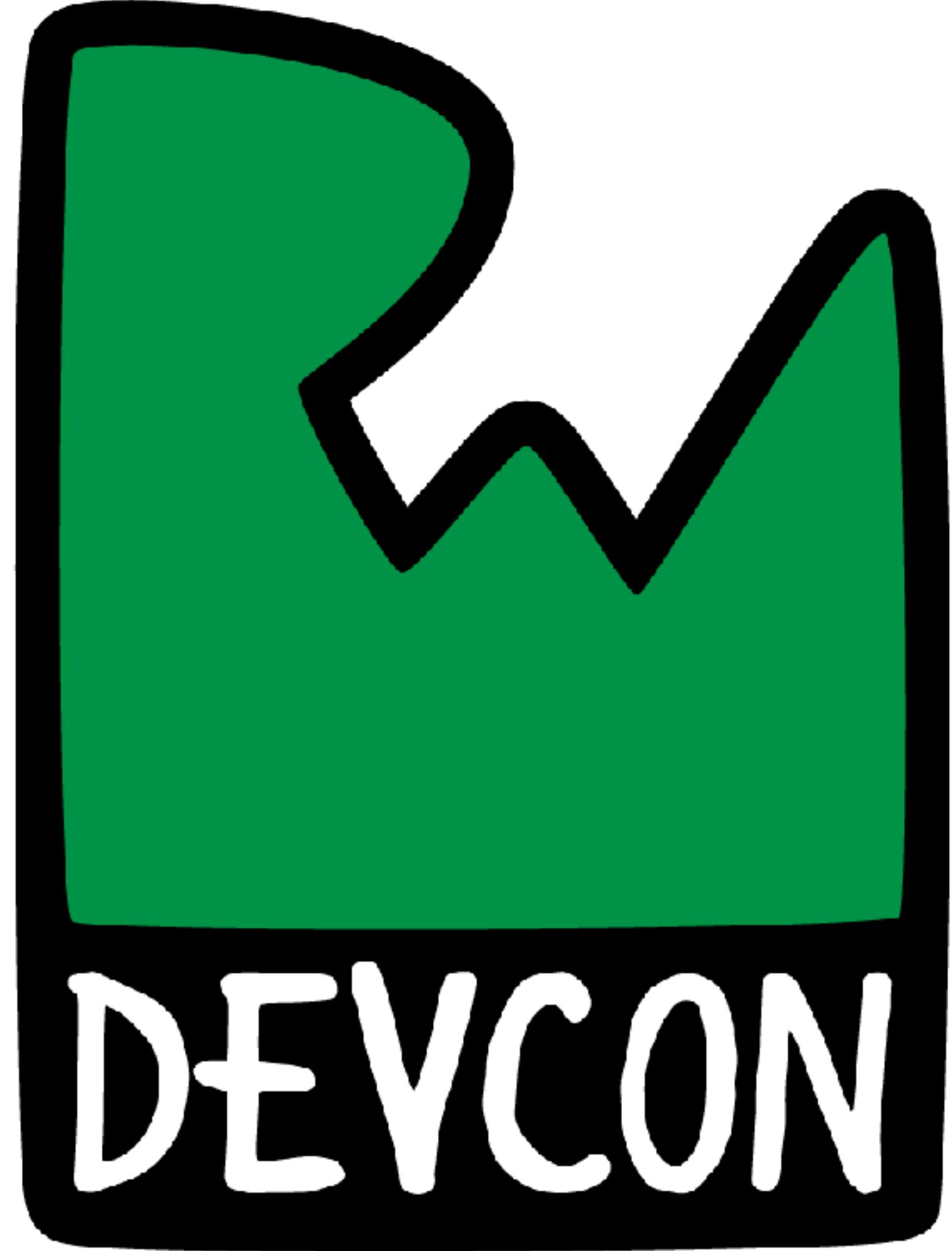
# DEMO 1

---

1. Model “get screencasts” API in Moya.
2. Integrate authentication using a Moya plugin.
3. Write user progress back to the API with additional Moya endpoints.



# Session 4: Cloning Netflix



RwM MARRYING MOYA, REALM & CODABLE

# JSONDECODER

---

```
open class JSONDecoder {  
    /// The strategy to use in decoding dates. Defaults to `deferredToDate`.  
    open var dateDecodingStrategy: JSONDecoder.DateDecodingStrategy  
  
    /// The strategy to use in decoding binary data. Defaults to `base64`.  
    open var dataDecodingStrategy: JSONDecoder.DataDecodingStrategy  
  
    /// The strategy to use in decoding non-conforming numbers. Defaults to `throw`.  
    open var nonConformingFloatDecodingStrategy: JSONDecoder.NonConformingFloatDecodingStrategy  
  
    /// The strategy to use for decoding keys. Defaults to `useDefaultKeys`.  
    open var keyDecodingStrategy: JSONDecoder.KeyDecodingStrategy  
  
    ...  
}
```



# JSONDECODER

```
open class JSONDecoder {  
    /// The strategy to use in decoding dates. Defaults to `deferredToDate`.  
    open var dateDecodingStrategy: JSONDecoder.DateDecodingStrategy  
  
    /// The strategy to use in decoding binary data. Defaults to `base64`.  
    open var dataDecodingStrategy: JSONDecoder.DataDecodingStrategy  
  
    /// The strategy to use in decoding non-conforming numbers. Defaults to `throw`.  
    open var nonConformingFloatDecodingStrategy: JSONDecoder.NonConformingFloatDecodingStrategy  
  
        /// The strategy to use for decoding keys. Defaults to `useDefaultKeys`.  
    open var keyDecodingStrategy: JSONDecoder.KeyDecodingStrategy  
  
    ...  
}
```



# DECODABLE

---

```
public protocol Decodable {  
    /// Creates a new instance by decoding from the given decoder.  
    /// This initializer throws an error if reading from the decoder fails, or  
    /// if the data read is corrupted or otherwise invalid.  
    /// - Parameter decoder: The decoder to read data from.  
    public init(from decoder: Decoder) throws  
}
```





Realm Database is an alternative to **SQLite** and **Core Data**. Thanks to its zero-copy design, Realm Database is **much faster** than an **ORM**, and often faster than raw SQLite.



# OBSERVER PATTERN

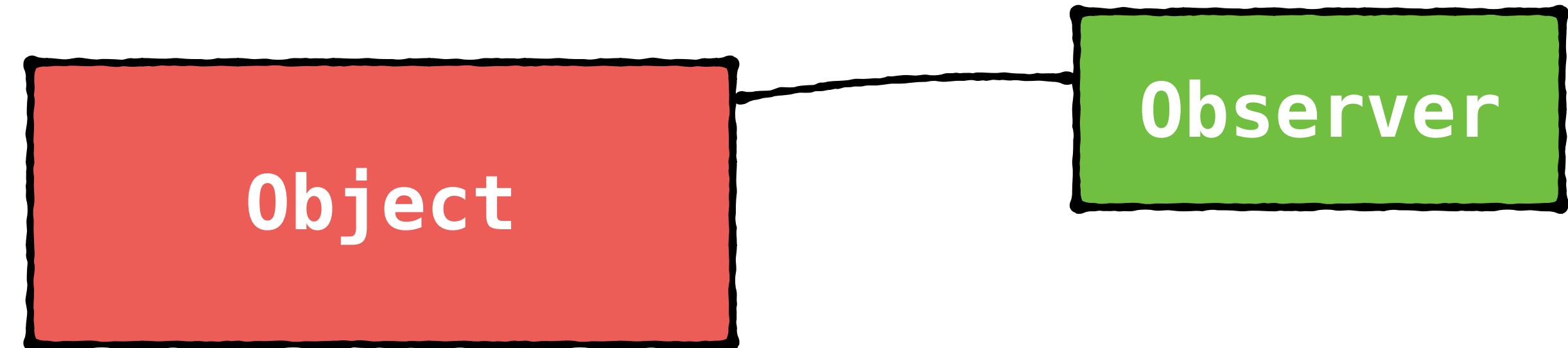
---

Object



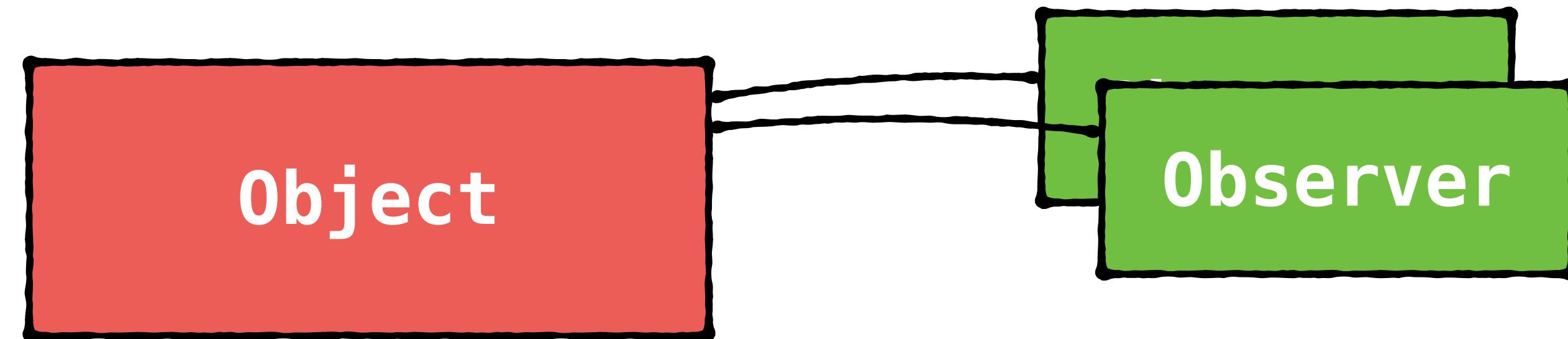
# OBSERVER PATTERN

---



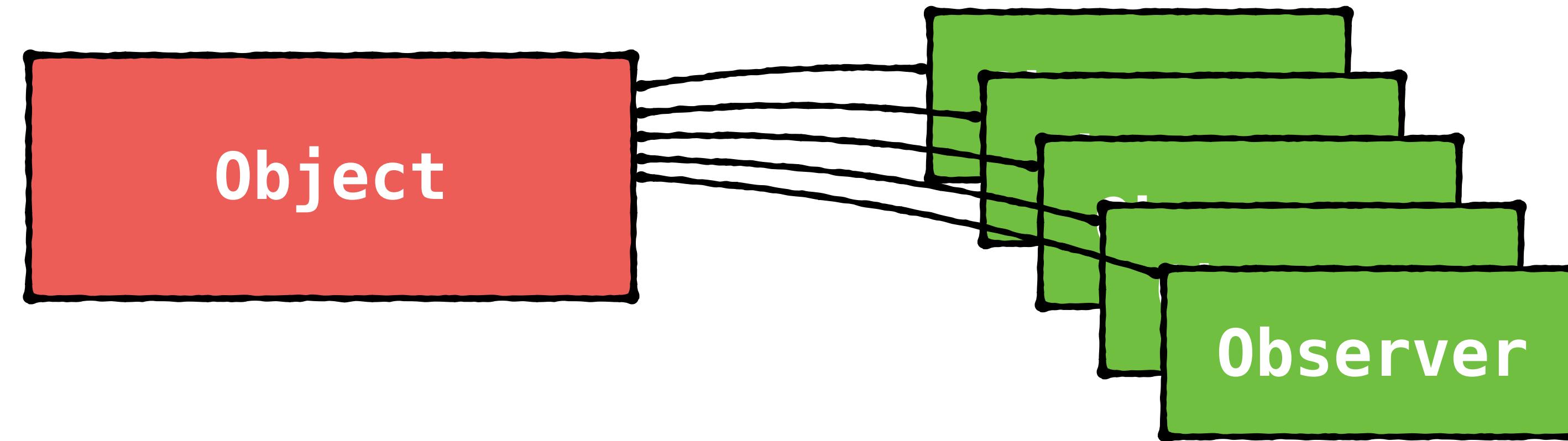
# OBSERVER PATTERN

---



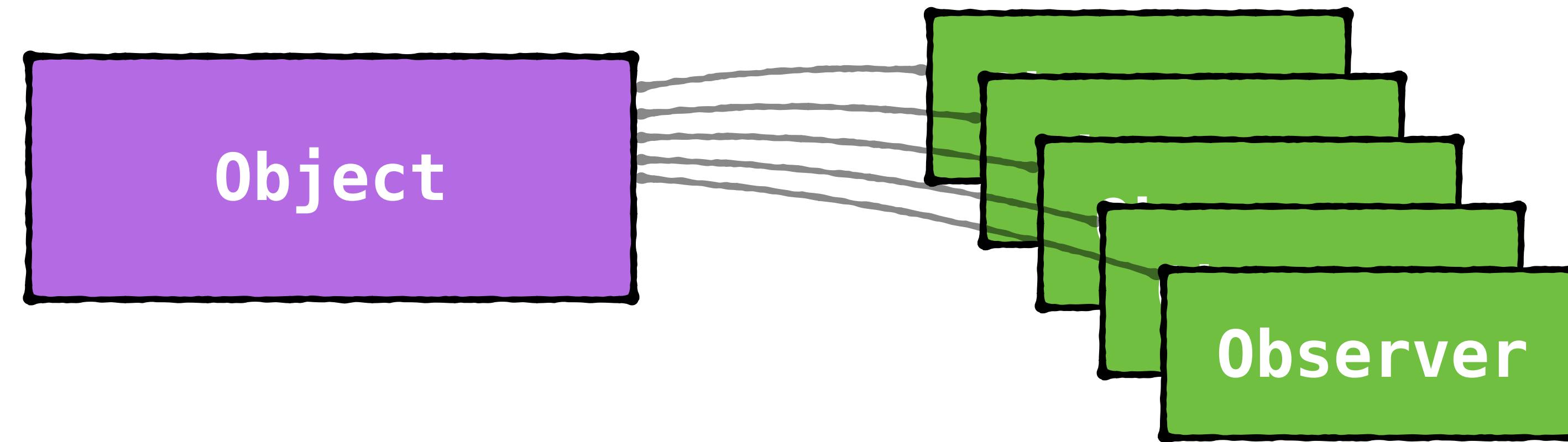
# OBSERVER PATTERN

---

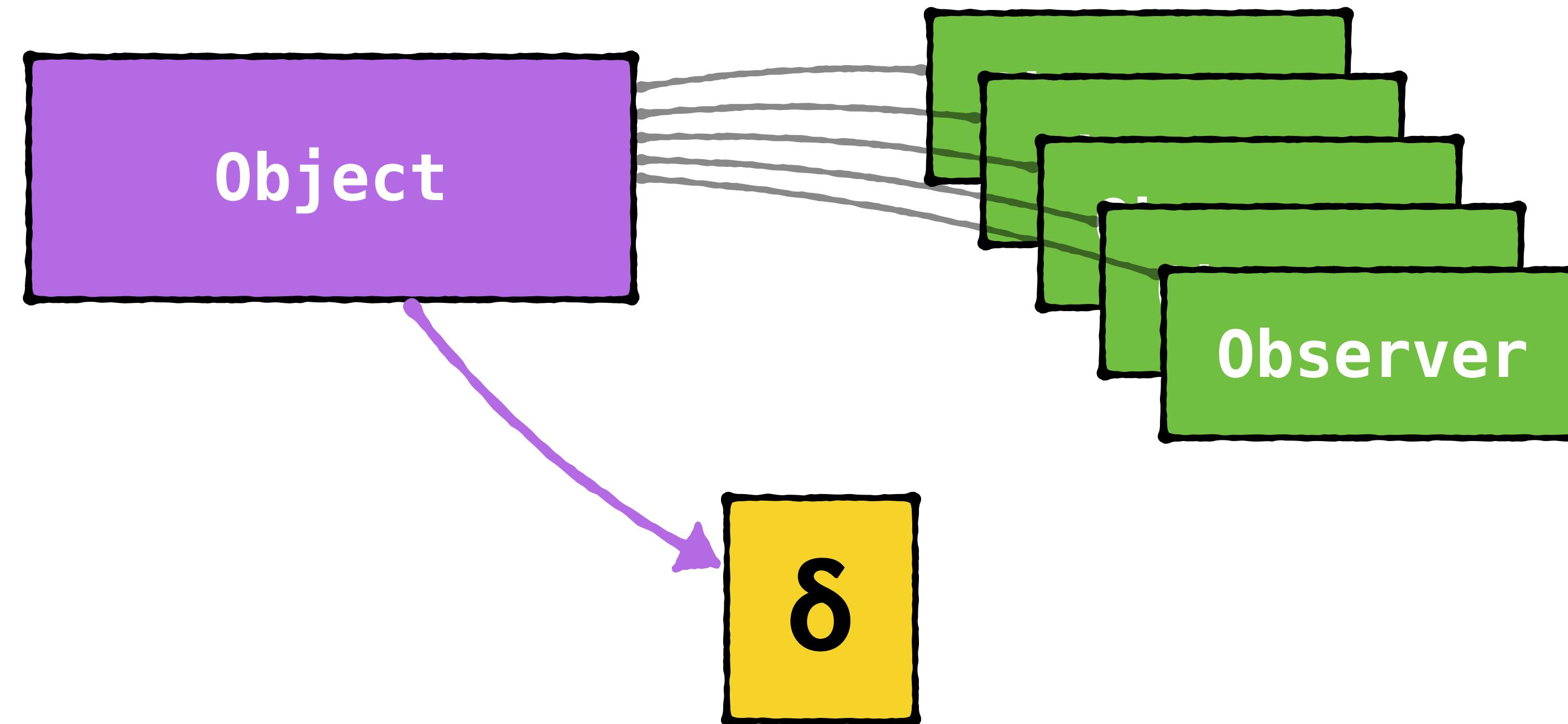


# OBSERVER PATTERN

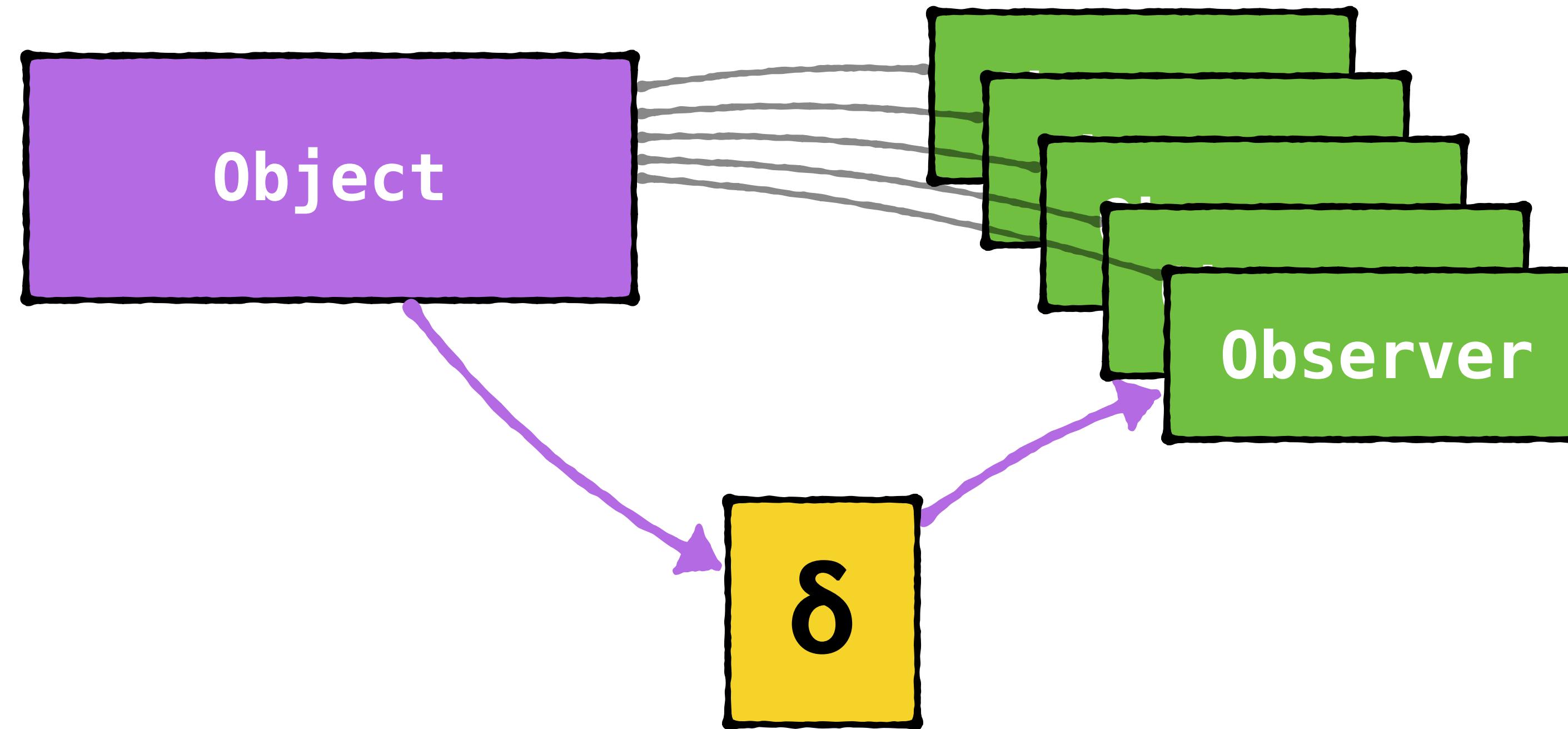
---



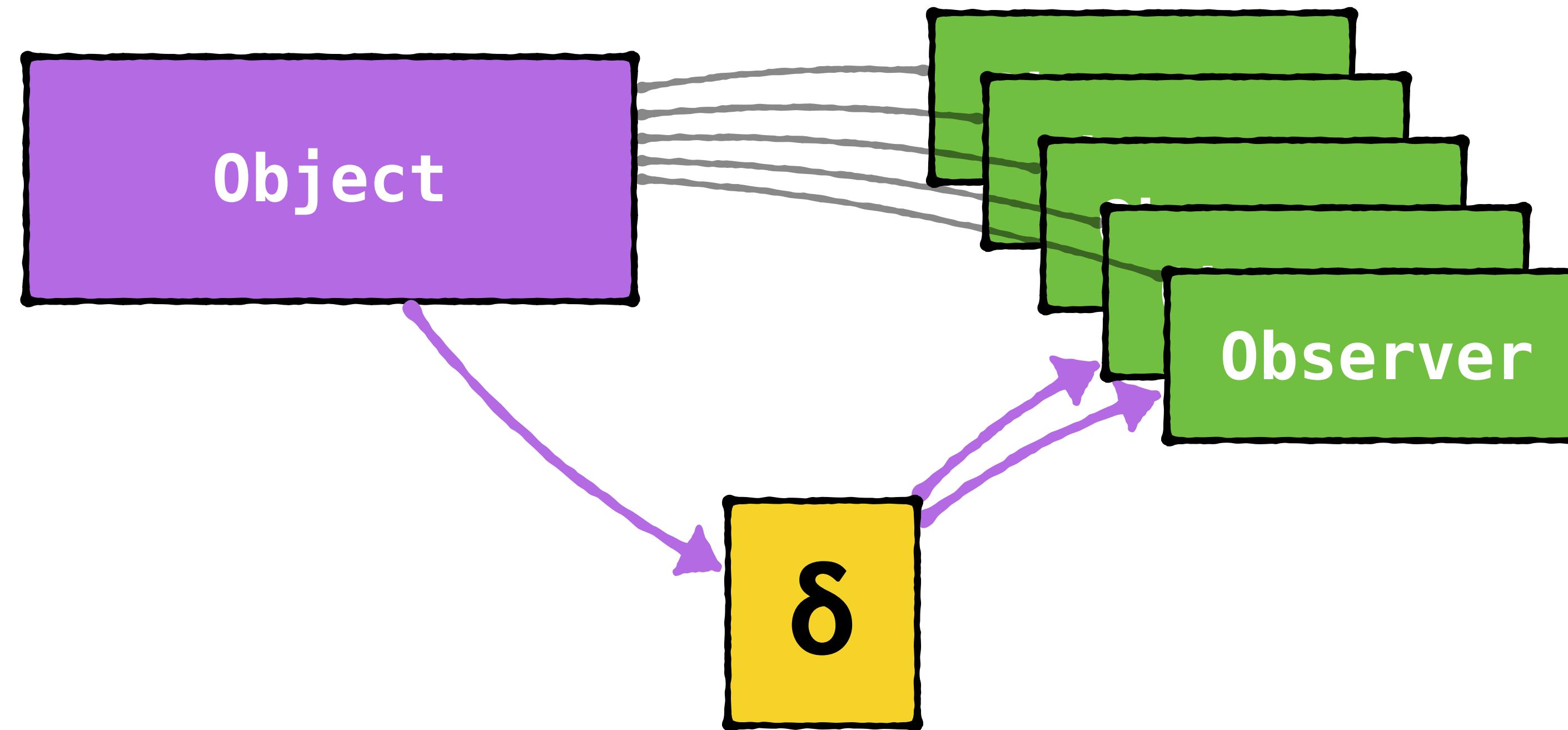
# OBSERVER PATTERN



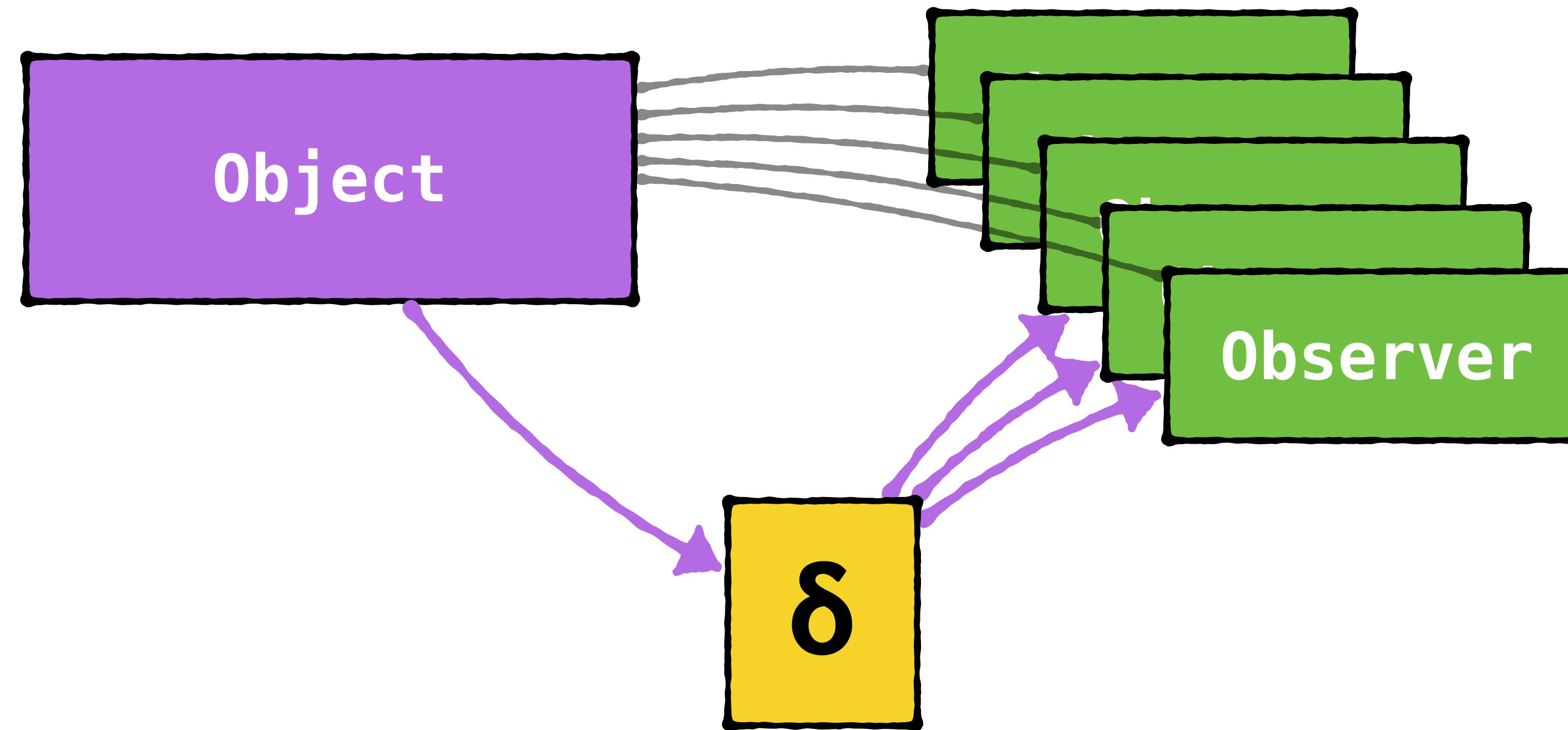
# OBSERVER PATTERN



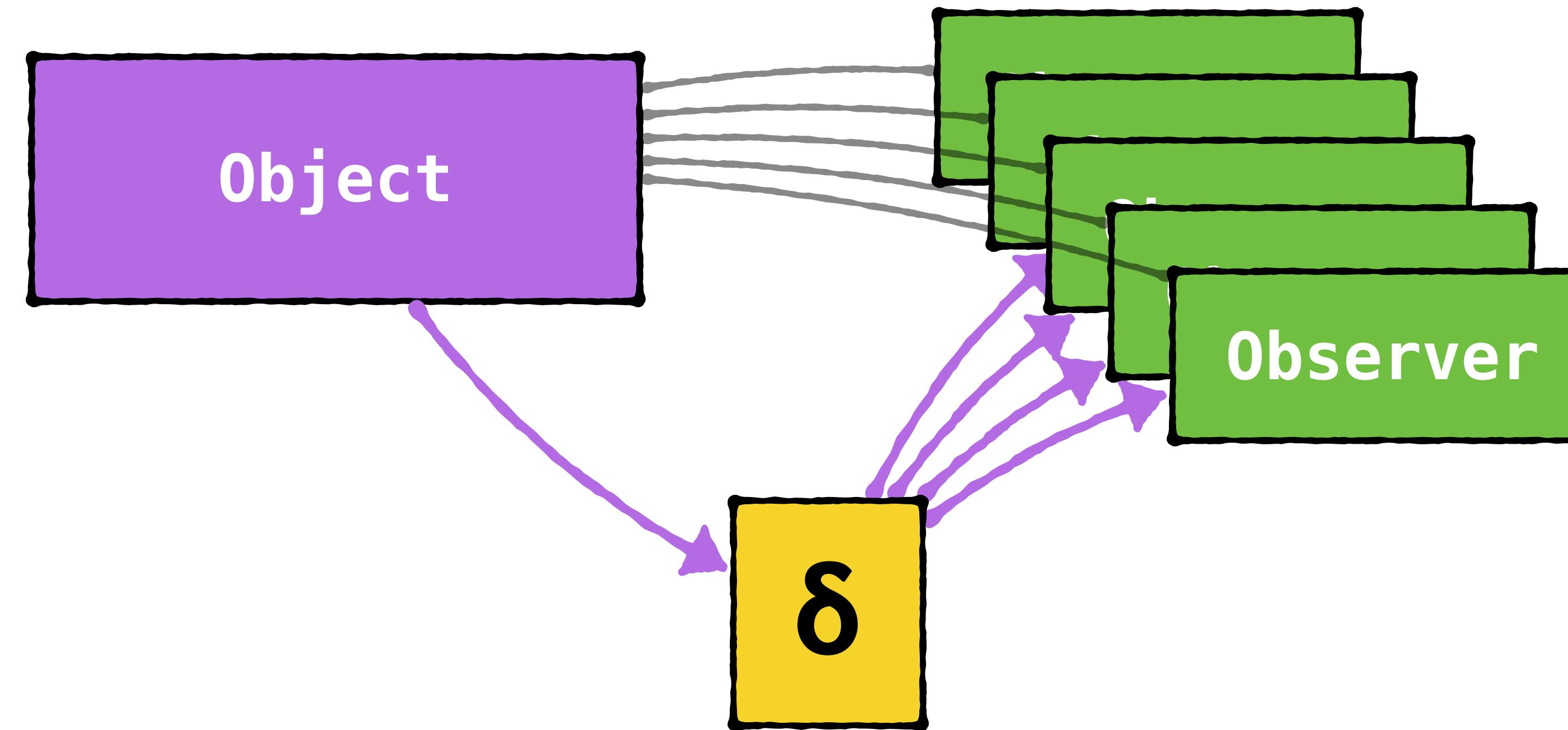
# OBSERVER PATTERN



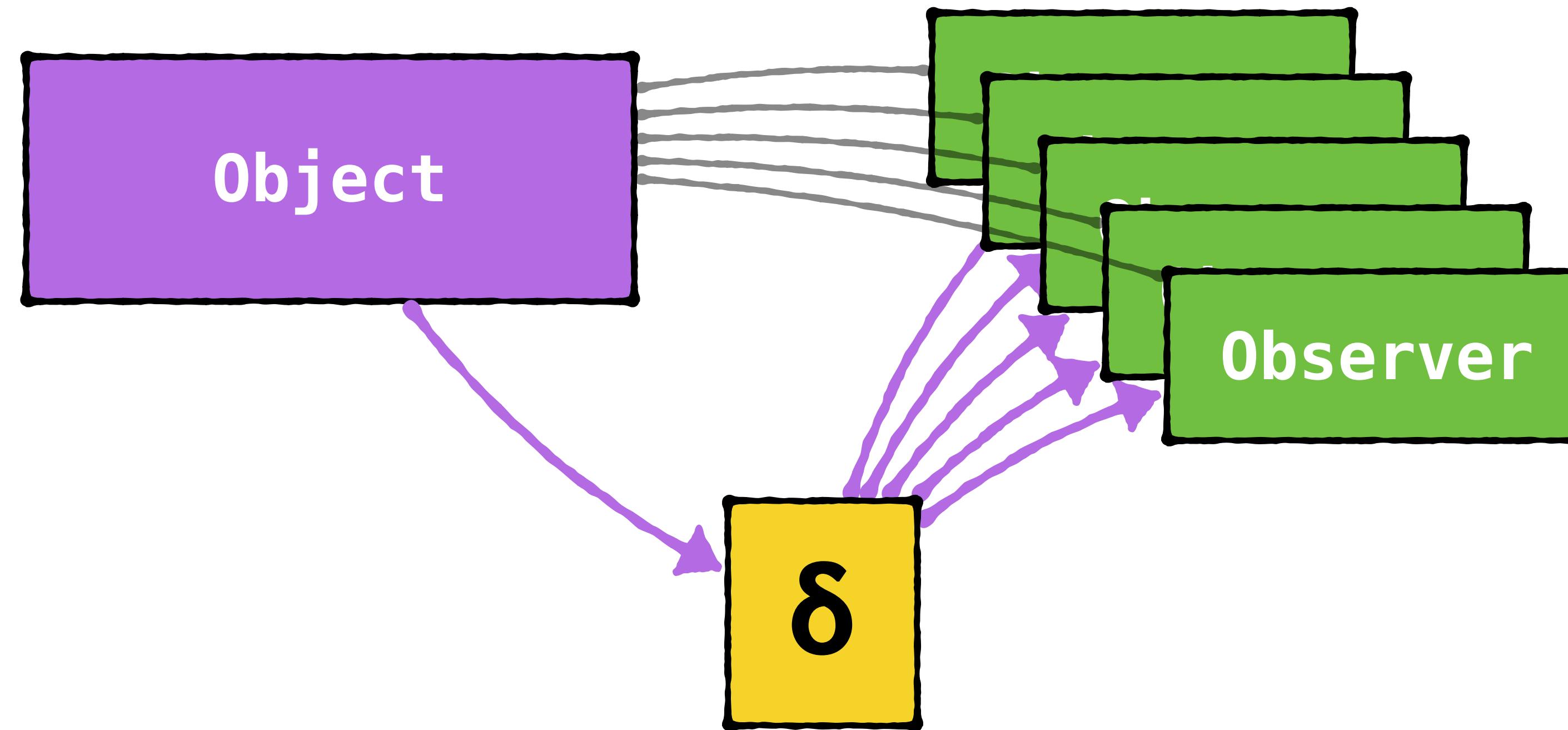
# OBSERVER PATTERN



# OBSERVER PATTERN



# OBSERVER PATTERN



DEMO 2



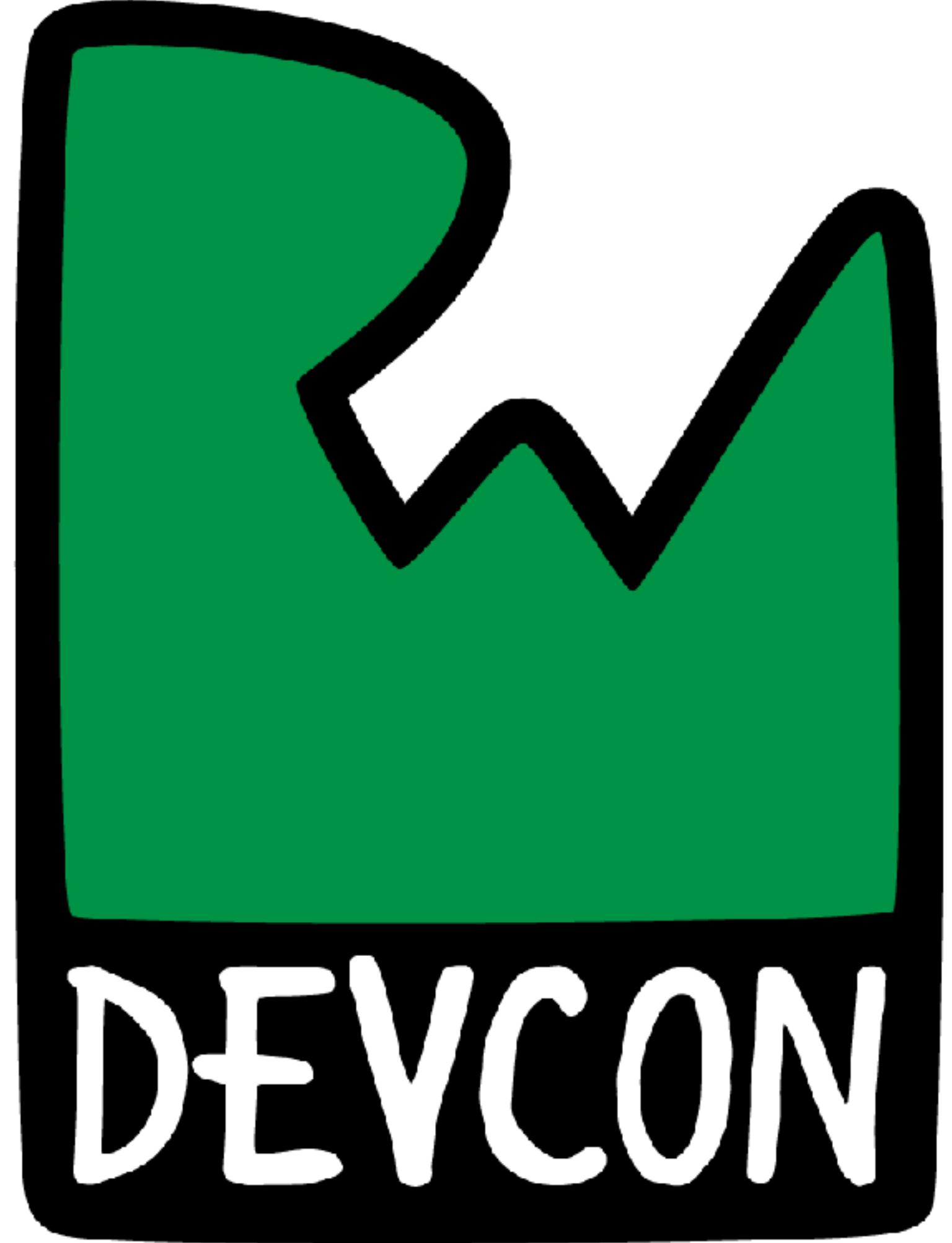
# DEMO 2

---

1. Customise Moya's JSON decoder.
2. Implement Decodable on a Realm object.
3. Use Realm's reactivity to deliver asynchronous results from the network.



# Session 4: Cloning Netflix



AUTO-SYNCING LOCAL CACHE

# VIEWING

---

```
@objcMembers class Viewing: Object, Decodable {  
    let rawCollectionId = RealmOptional<Int>()  
    dynamic var videoId: Int = 0  
    dynamic var time: Int = 0  
    dynamic var duration: Int = 0  
    dynamic var finished: Bool = false  
    dynamic var updatedAt: Date = Date(timeIntervalSince1970: 0)  
    dynamic var dirty: Bool = false  
  
    ...  
}
```



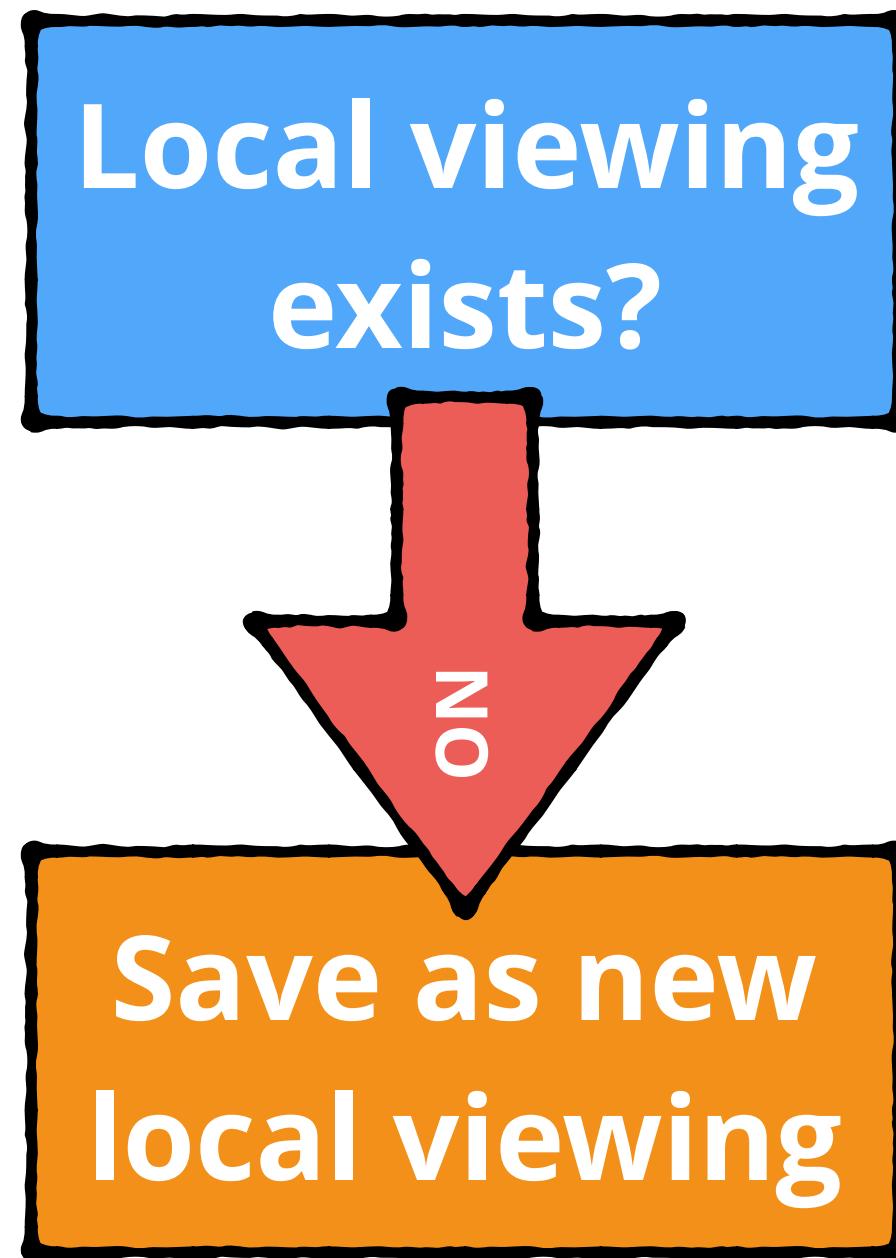
# CONFLICT RESOLUTION

---

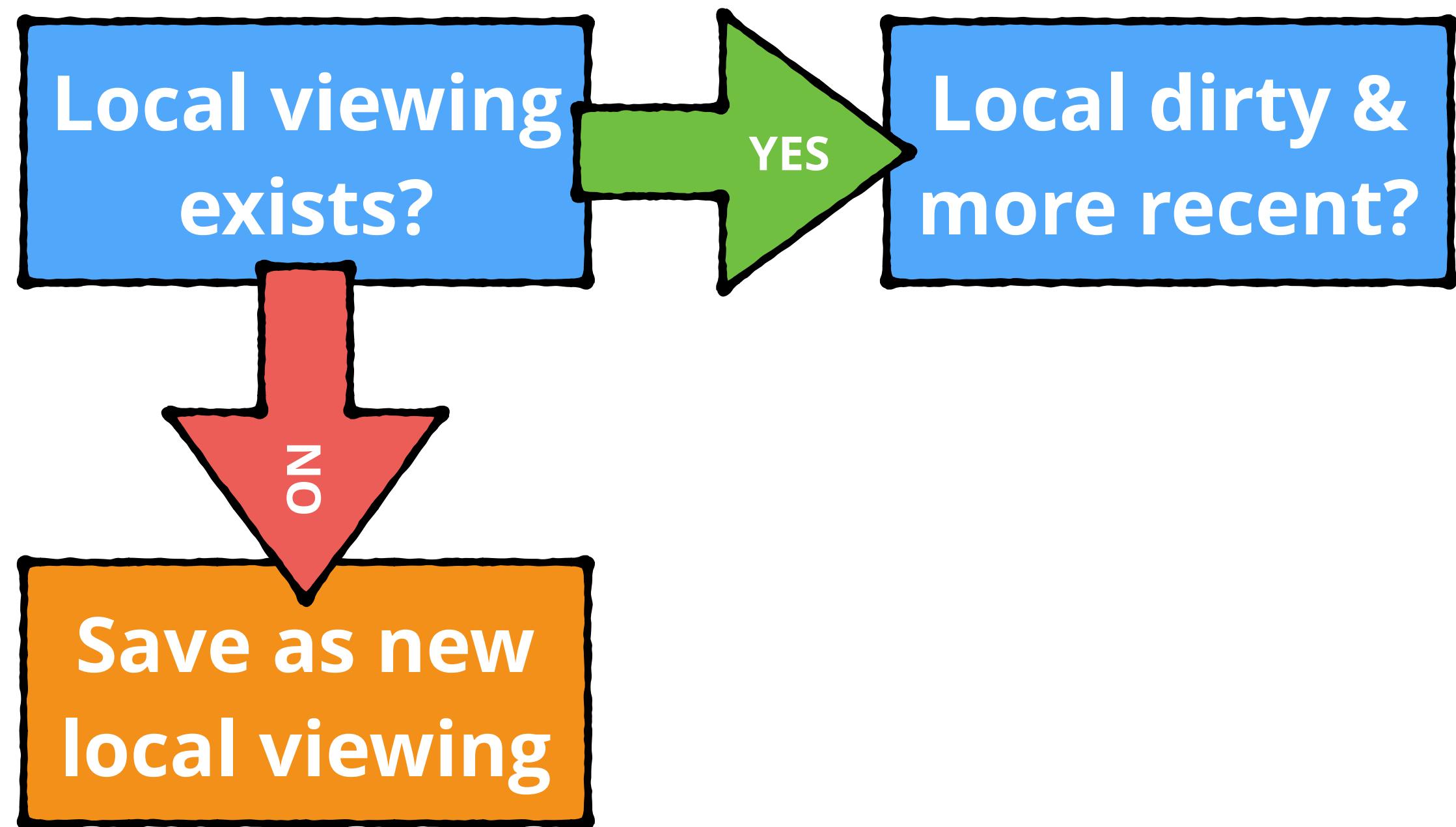
Local viewing  
exists?



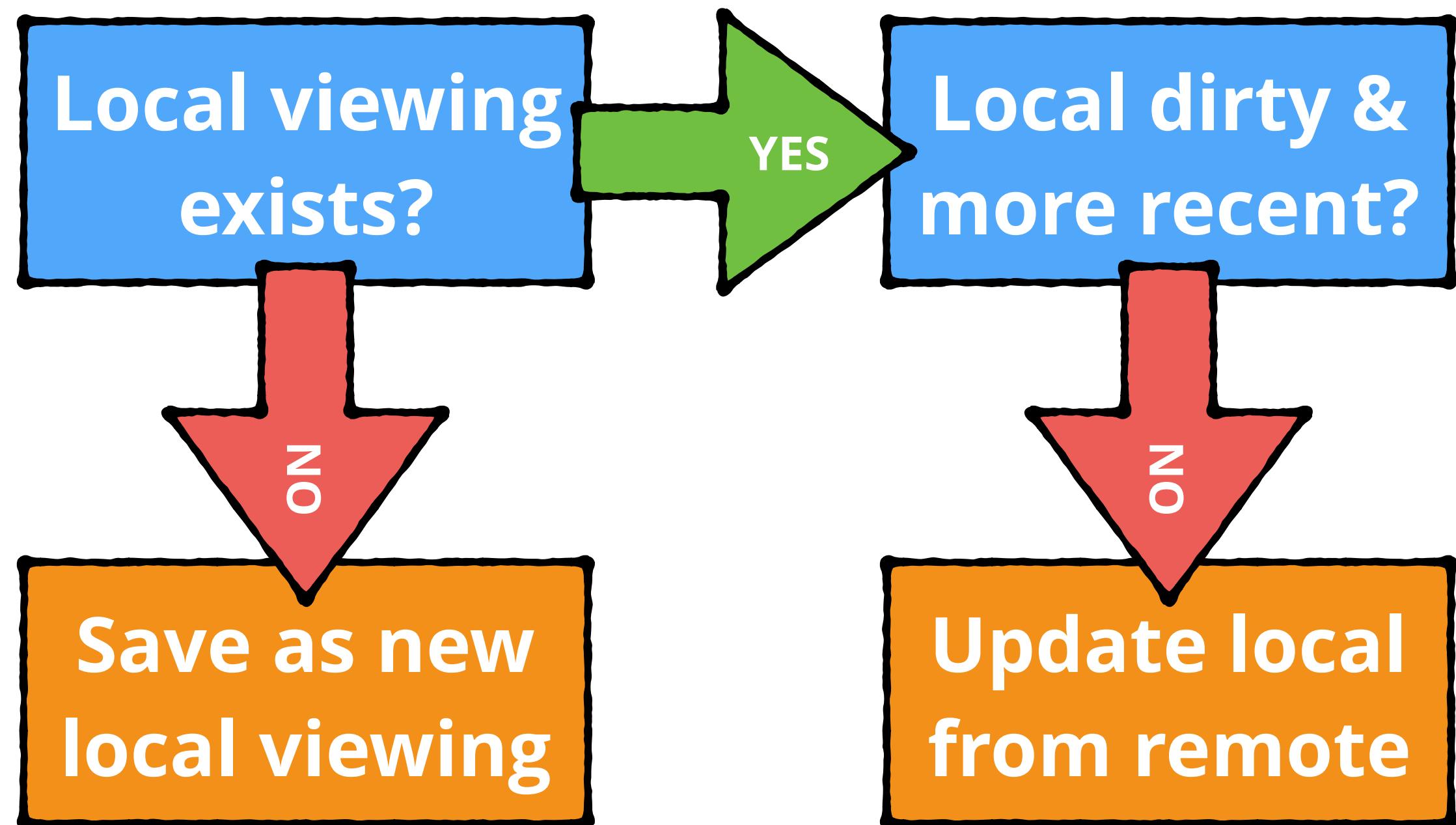
# CONFLICT RESOLUTION



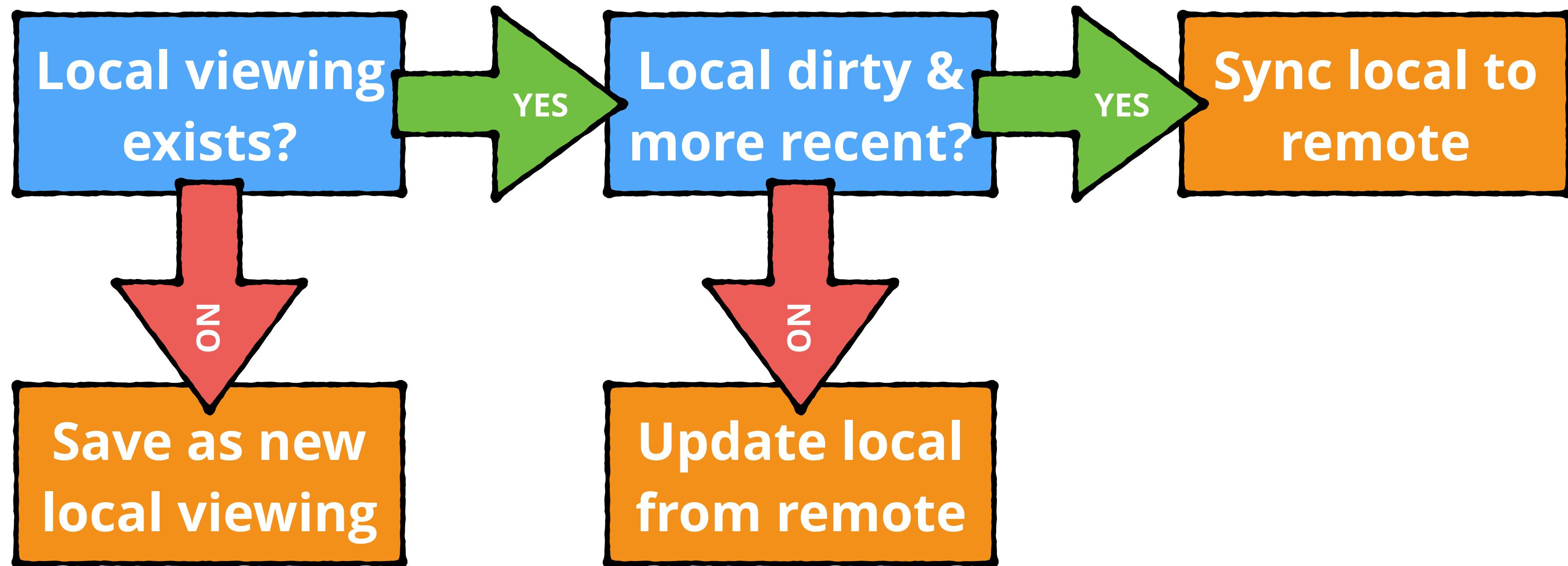
# CONFLICT RESOLUTION



# CONFLICT RESOLUTION



# CONFLICT RESOLUTION



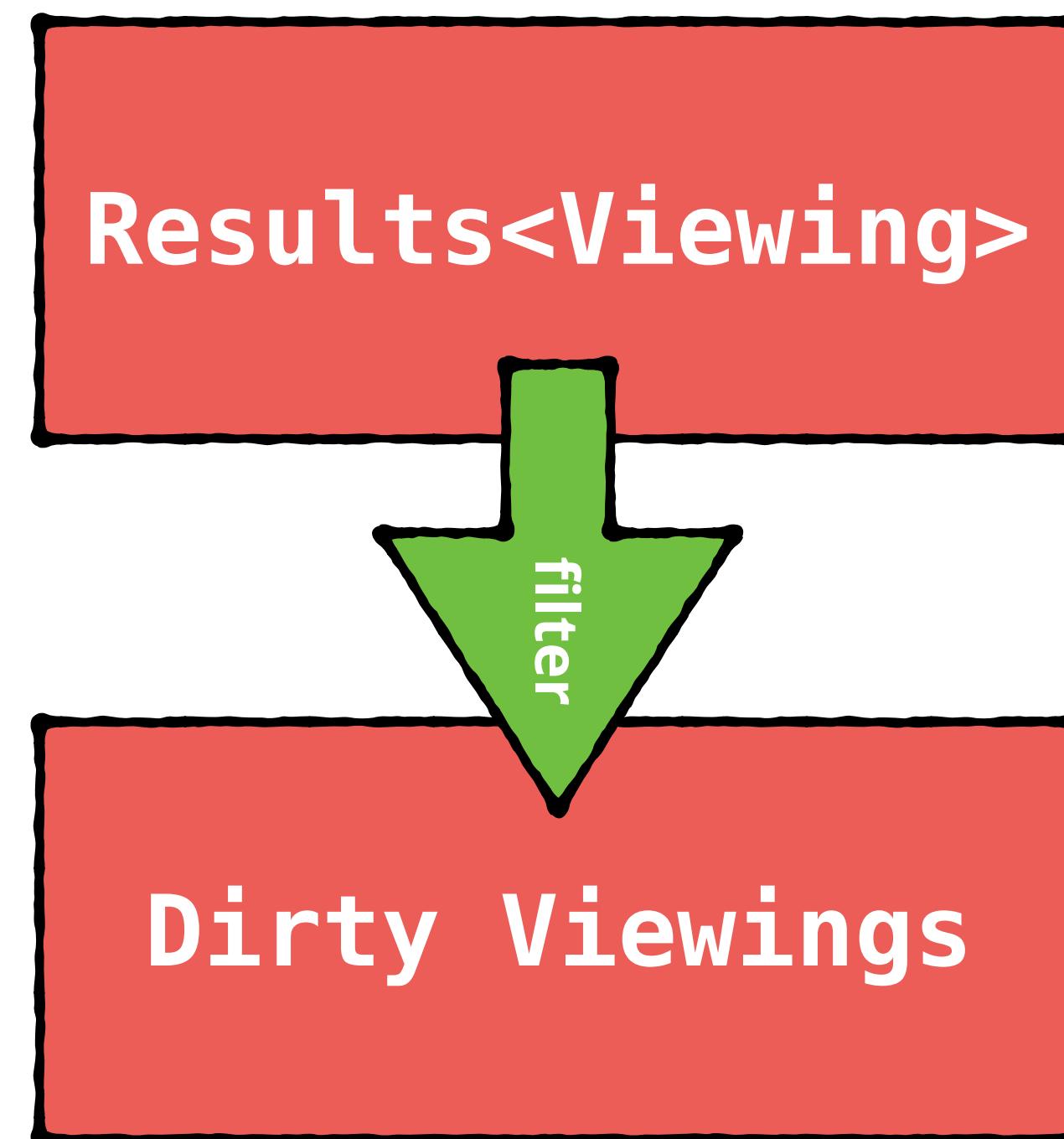
# SYNCING BACK TO REMOTE

---

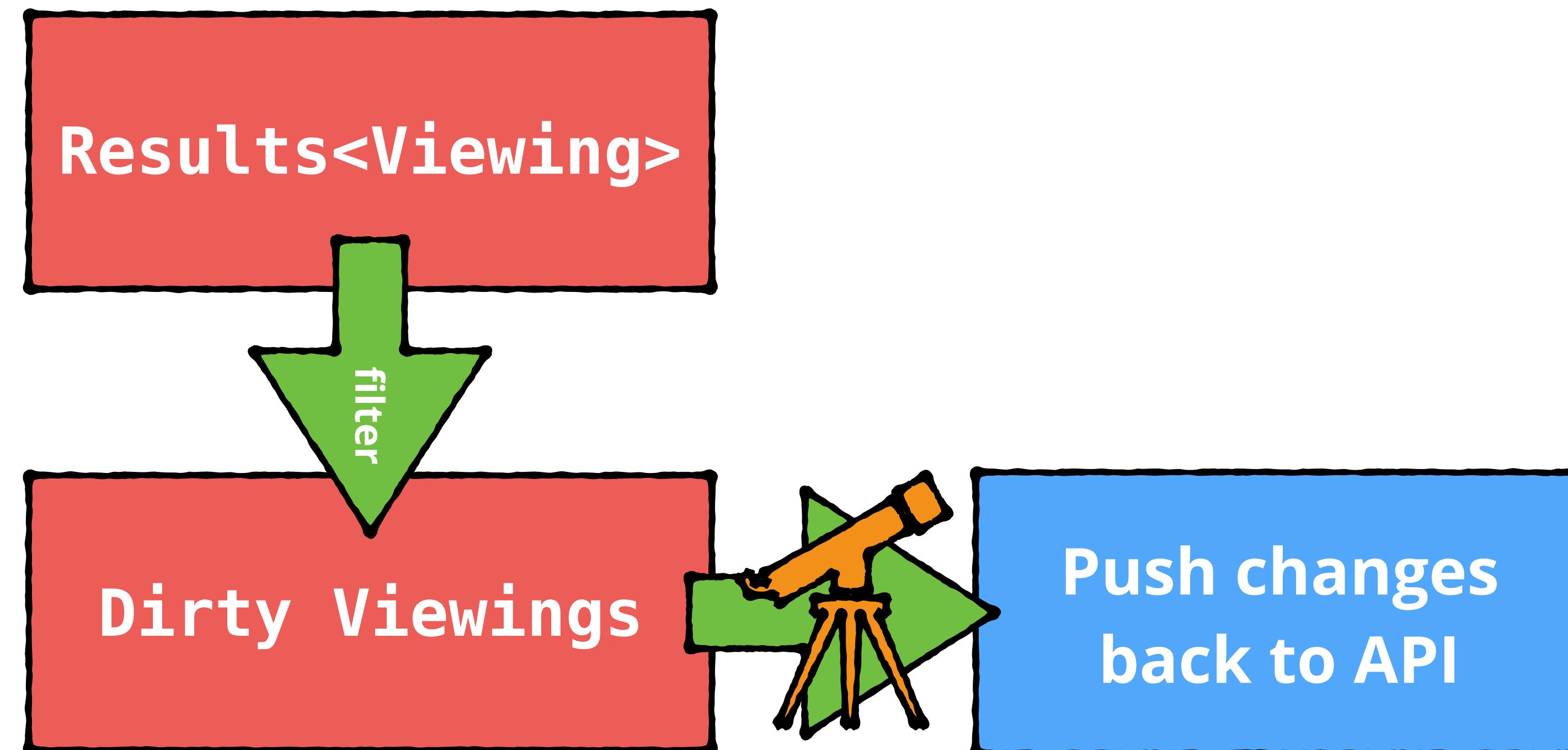
Results<Viewing>



# SYNCING BACK TO REMOTE



# SYNCING BACK TO REMOTE



DEMO 3



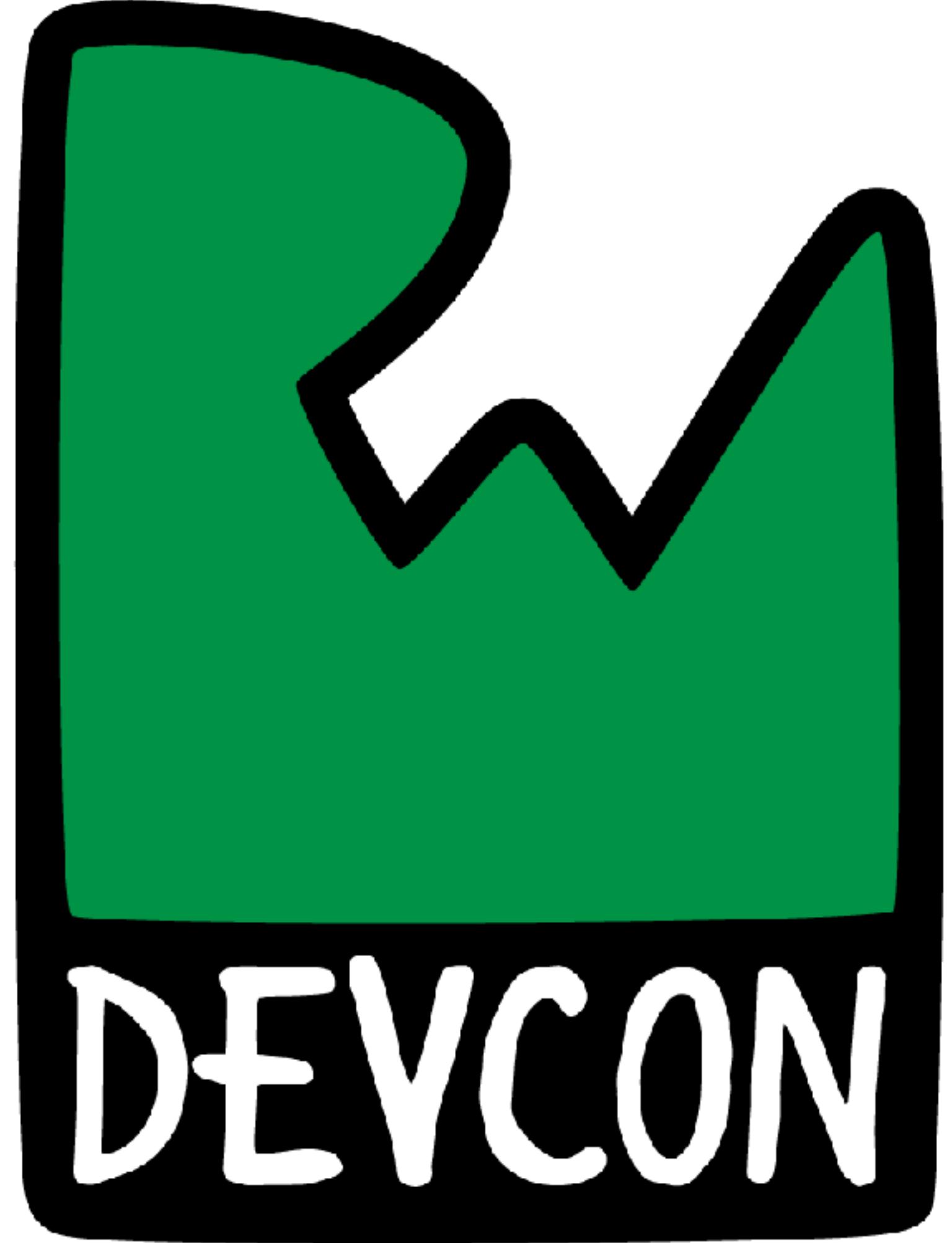
# DEMO 3

---

1. Add a timer to the video player to observe the user's progress.
2. Seek to the correct point when starting video playback.
3. Merge user progress from the API to the local cache.
4. Auto-sync locally updated progress records with the API.



# Session 4: Cloning Netflix



CONCLUSION

# WHAT DID YOU LEARN?

---

- ⚙️ **Demo 1:** Using Moya to model a RESTful API.
- ⚙️ **Demo 2:** Moya, Realm & Codable in sweet harmony.
- ⚙️ **Demo 3:** Building a local cache in Realm with auto-sync to a remote API.



# WHERE To Go FROM HERE?

---

- ⚙️ [realm.io](https://realm.io)
- ⚙️ [moya.github.com](https://moya.github.com)
- ⚙️ <https://engineers.sg/video/codeable-in-swift-4-ios-conf-sg-2017--2061>
- ⚙️ <https://videos.raywenderlich.com/screencasts/1249-what-s-new-in-foundation-parsing-json-in-swift-4>
- ⚙️ Twitter: [@iwantmyrealname](https://twitter.com/iwantmyrealname)

