TDD IN FR  NTEND

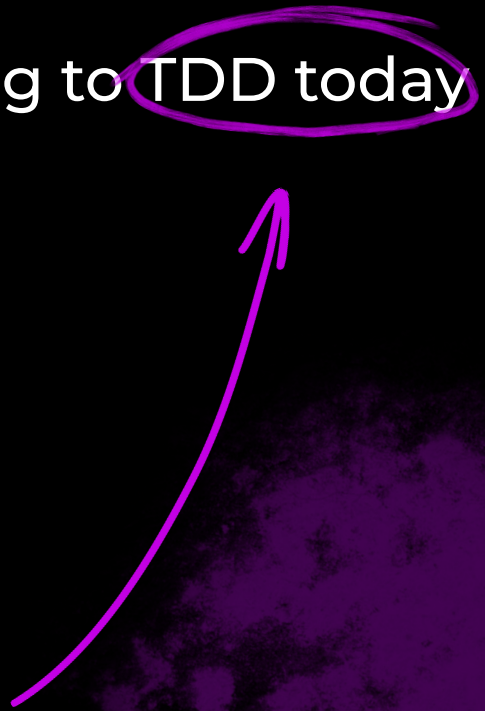
by Aleksandr Shinkarev

Back in the early 1990s

Test Driven Development (TDD) is a software development approach where tests are written before the actual code. Yeah, that’s it...

Bottom Line

Writing your code according to TDD today is a **fun** way of working



Is it a magazine or something?

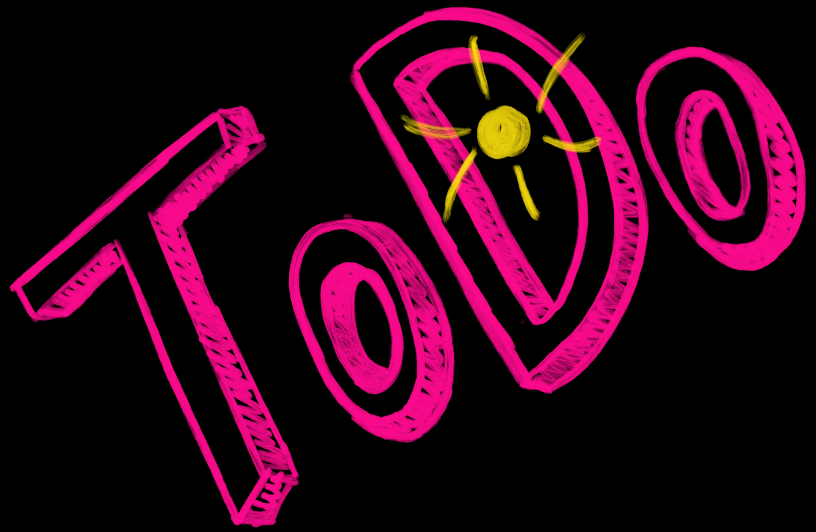
Why ToDDay?

1. Maturity
2. Technologies
3. Automation

Context

Your Favorite Web App

Two User Stories
Ugly looking UI



Not only in-memory!

Making actual network calls
when The Empire strikes back.

User Story Numero Uno

List of ToDos

As a User
Want to be able to see my ToDos
So that I know what is left to be done

Contract First

Endpoint to Read

GET /to-dos-api/to-dos

Response

```
{
  "toDos": [
    {
      "id": 1,
      "name": "Test"
    }
  ]
}
```

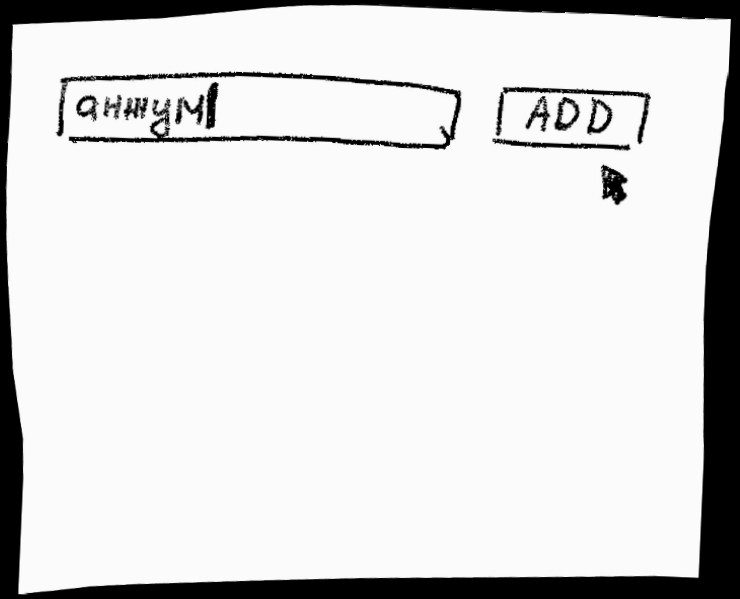
User Story Deux

New ToDo

As a User
Want to be able to add a new ToDo
So that I can keep track of my duties

Acceptance Criteria

1. I can add a ToDo with some name
2. When I add it, it should appear in the list of my ToDos



Contract First

Endpoint to Create

POST /to-dos-api/to-dos

Request Body

```
{
  "name": "Dishes"
}
```

Response

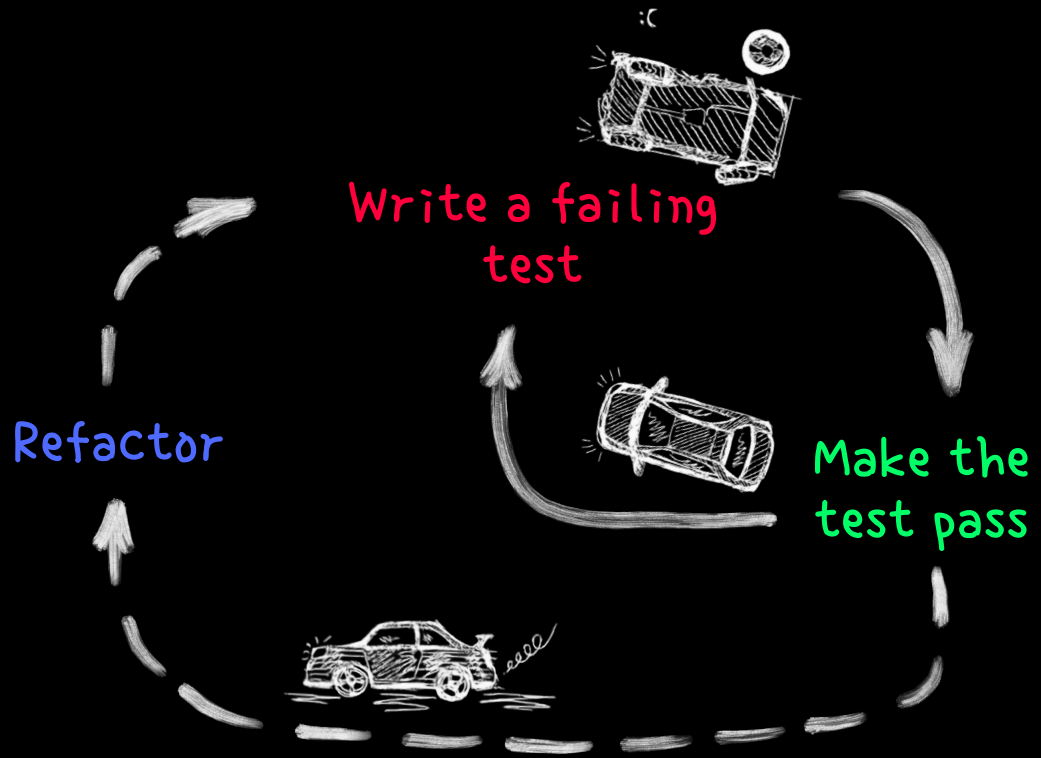
```
{
  "newToDoId": 2
}
```

Endpoint to Delete

DELETE /to-dos-api/to-dos?toDoId=2

TDD Recap

Red - fail
Green - pass
Blue - improve



Show time!

https://github.com/TourmalineCore/to-dos-ui

https://github.com/TourmalineCore/to-dos-api

Swagger

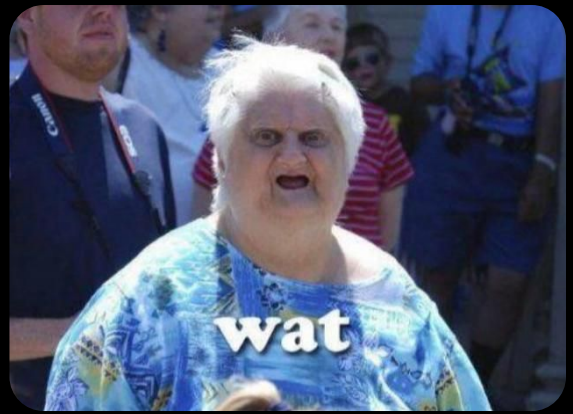
- OpenAPI Specification
- Playground
- Typed Backend Code → OpenAPI Specification → TypeScript Types

Swagger home page

https://swagger.io/

Cypress is WAT?

- A tool to write and run your web app tests within
- A way to make everything visual
- A sandbox for kids with a not yet ready ~~broken~~ API



Cypress landing shows it all

https://www.cypress.io/

Behaviour-Driven Development with Whom?

Bless you!

Example of Gherkin syntax for specifications

Given a free online course

When watch it and practice

Then don't buy expensive courses

https://cucumber.io/docs/bdd/

https://cucumber.io/docs/bdd/better-gher

Cypress Component Tests

- You test a component in isolation
- Isolation means no website is running, no backend
- Only the component itself is rendered

Cypress docs about it

https://docs.cypress.io/guides/component-testing/overview

One more nice ref from there

https://www.componentdriven.org/

Image

http://surl.li/satmn

What is state?

State Management

When interact with UI

Update state

When change state

Update UI

Why MobX?

1. As Simple as Possible
2. Clean

https://mobx.js.org/

ES6 Class is MobX Friend #1

```
class TimerState {
    private _secondsPassed = 0

    constructor() {
        makeAutoObservable(this)
    }

    get secondsPassed() {
        return this._secondsPassed
    }

    increaseTimer() {
        this._secondsPassed += 1
    }
}
```

The only bit of MobX magic

That is how we read from getters with **no** arguments

This is how we modify state using class methods that you **never** read through

MobX example

https://mobx.js.org/react-integration.html

React Context is the 2nd MobX Bestie

```
const TimerStateContext = createContext<TimerState>()

<TimerStateContext.Provider value={new TimerState()}>
    <TimerView />
</TimerStateContext.Provider>,
```

This is how we inject the state class **instance**

Nested React Context to get it
not only for Dependency Injection

https://medium.com/@Nicklannelli/nested-context-the-underrated-aspect-thats-probably-missing-from-your-react-app-16e73f7d1

React Context is the 2nd MobX Besty

MobX magic!

```
const TimerView = observer(() => {
   const timerState = useContext(TimerStateContext)

   return (
       <span>
           Seconds passed: {timerState.secondsPassed}
       </span>
   )
})
```

This is how we access the state

Cypress E2E Tests

Here you test your end product

Opens your product inside Cypress

You make calls to your real backend (no or very little mocking)

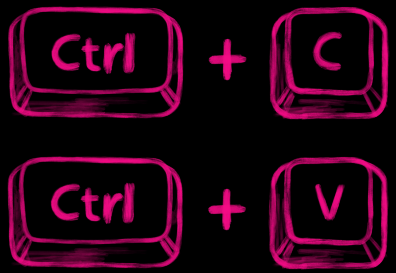
You act like a real user of your product (as much as it makes sense)

Cypress E2E getting started

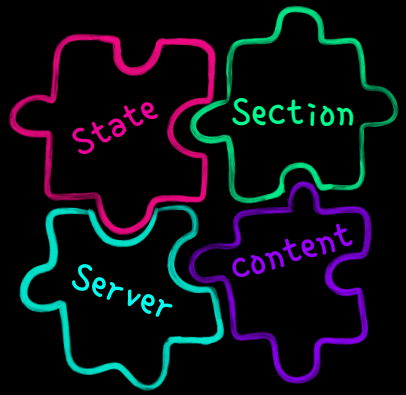
https://docs.cypress.io/guides/end-to-end-testing/writing-your-first-end-to-end-test

Why so complex with all these Content, Container, State?

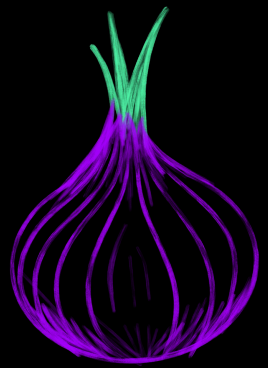
Repeatable

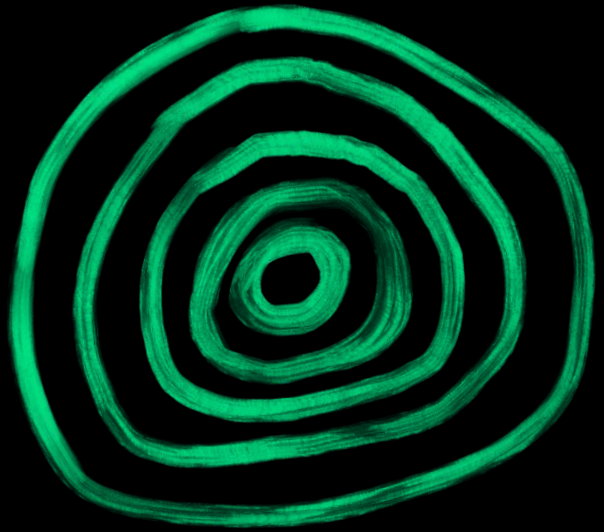


Separation of Concerns



Layers



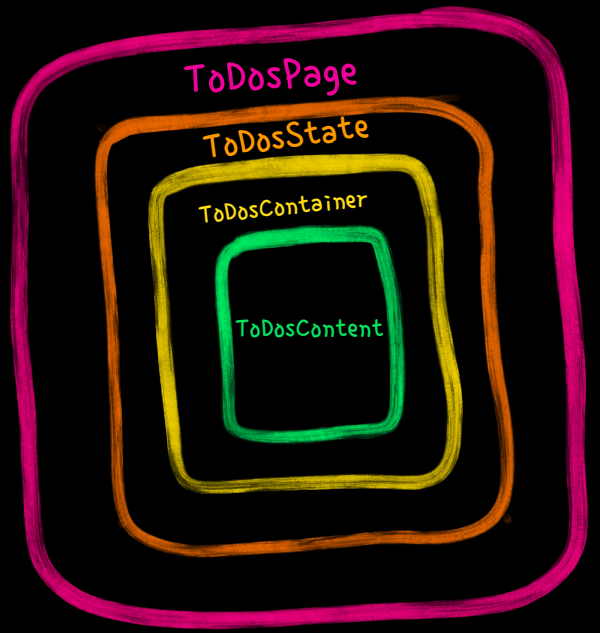


ToDo App Example

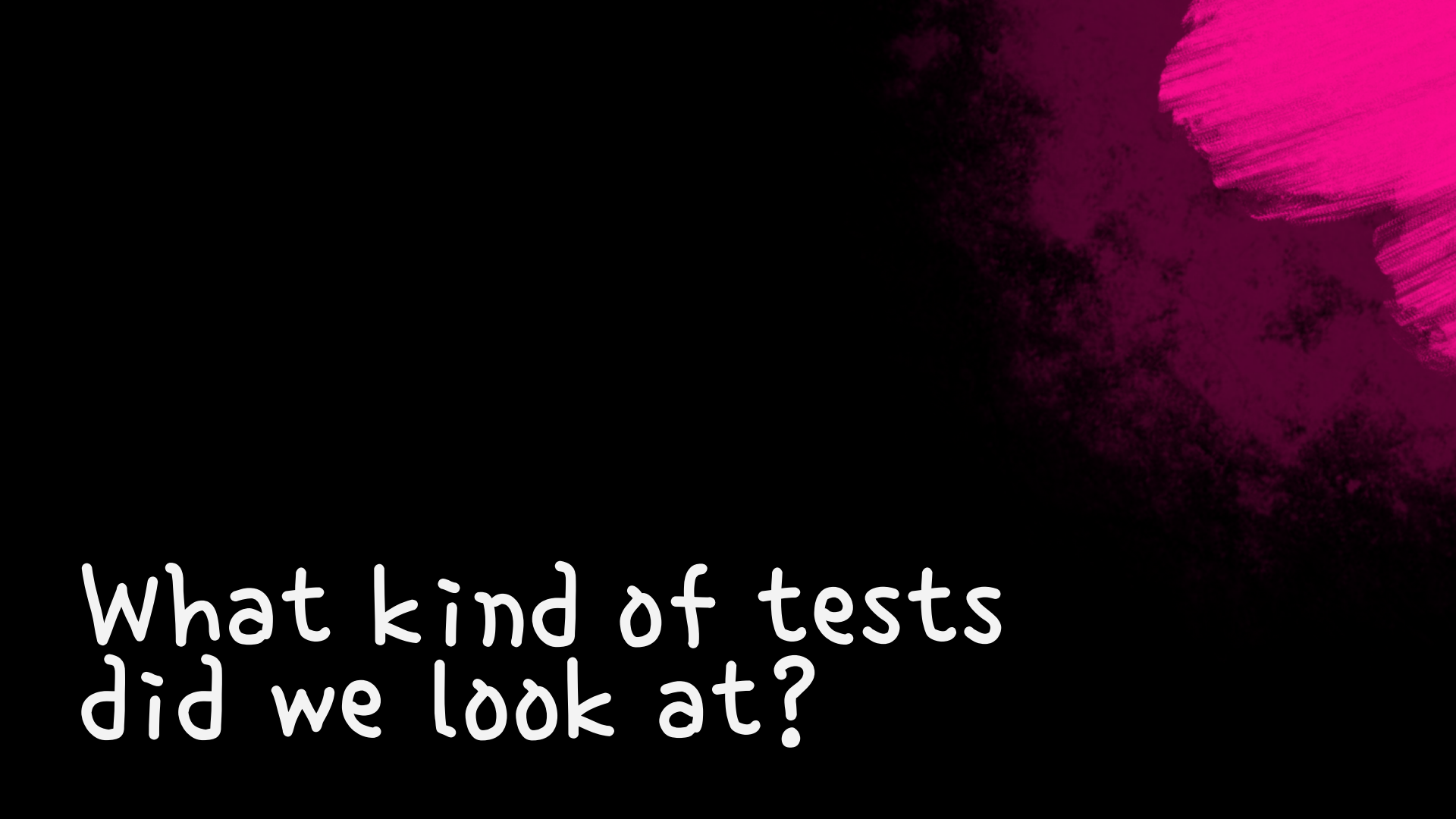
Closer to Real Life

Components Hierarchy

- Page - orchestrates
- State - data for read and write
- Container - makes network calls
- Content - interaction, **most** tested one



It is questionable, isn’t it?


What kind of tests
did we look at?

Types of Tests

1. State
2. Component
3. E2E
4. Contract
   using linting by auto-generated API types

Where to Test?

State

Tricky logic with your state (modification and read)

- Toggle selection of items
- Validation of input
- Filtration

Content

How it is rendered, if functions are called or not after certain event

- Is a button disabled at certain state?
- If I see a thing?
- If I click here will this callback be called/not called?

Where to Test?

Container

Data loading and data modification via network

- Can I receive data via network and see it?
- Can I save data via network?
- What if I receive an error making a network call?

E2E

I can execute the user flow of the end product

- Going through the core business flow
- Reveals issues at **any** layer preventing users from getting the main business value
- The biggest ROI (Return of Investment)

Benefits of Working Like That on Frontend

Testability is baked-in

You don’t really test manually

You are independent from API

You can make quite complex pages based on these ideas

Code does what you expect from it

You get some dopamine

Drawbacks

- It is difficult
- You need to carefully decide on your Testing Strategy
- Cypress is a drama queen sometimes

These are Just Tools

- React
- Cypress
- MobX
- Swagger

But What You Really Need Is

More References

One more guideline
from my ex-colleague

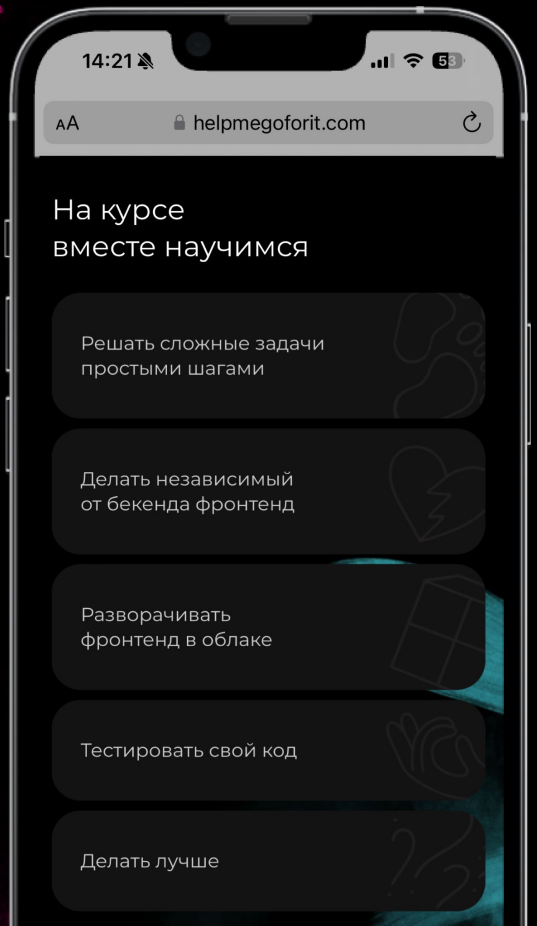
Bran van der Meer - Test-Driven Development
in JS with Acceptance Tests 53m
https://www.youtube.com/watch?v=ym62X_gvMXs

Uncle Bob's live
coding on the subject

Robert C. Martin - The Three Laws of TDD
1h 06m
https://www.youtube.com/watch?v=AoIfc5NwRks

More about modern
application of TDD itself

Dave Farley - TDD - Test Driven Development
30 videos playlist
https://www.youtube.com/playlist?list=PLwLLcwQlnXByqD3a13UPeT4SMhc3rdZ8q



Course :)

FronTDD Architecture

We are having the course tested
and gathering feedback

Landing about course

https://helpmegoforit.com

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12 years of experience

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