Mixing in Elixir to Build Search

Friday, 16 March

Code BEAM SF

Adrian

Software Engineer
Search & Personalization

Building all things search at Teachers Pay Teachers
www.teacherspayteachers.com

- github/twitter: @drincruz
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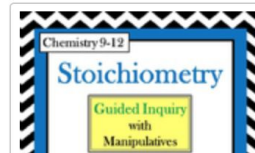# Register for free to receive:

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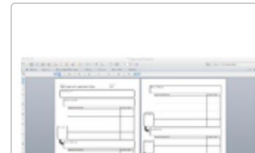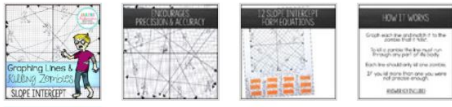9 - 12   ›
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SUBJECT

AMERICAN LITERATURE OVERVIEW

Chemistry 9-12
Stoichiometry
Guided Inquiry with Manipulatives

Graphing Lines & Zombies ~ Slope Intercept Form

Subject
Algebra, Graphing, Halloween

Grade Levels
7th, 8th, 9th, 10th

Resource Type
Worksheets, Activities, Printables

Product Rating
★★★★ 4.0 • 1,091 ratings

File Type
PDF (Acrobat) Document File

Be sure that you have an application to open this file type before downloading and/or purchasing.

1 MB | Includes Graph Page (with and without numbers), Equations, and Answer Key

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$1.50
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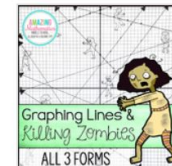＋ Add to Wish List

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Graphing Lines & Zombies ~ Point Slope...
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Graphing Lines & Zombies ~ All 3 Forms
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Product Description

This zombie themed graphing activity will strengthen your students' skills in graphing lines in slope intercept form.

Mixing in Elixir

—

What does that mean?

Mixing in Elixir

—

What does that mean?

Breaking the monolith...

Mixing in Elixir

—

What does that mean?

Breaking the monolith...by porting pages piecemeal

Let's talk about search

—

Let's talk about search

Let's start searching...

___

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math

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Suggestions

st patricks day math

math

math games

math centers

math worksheets

Sellers

Math Mojo

Literacy and Math Ideas

Resources

Math Centers

See all results for **math**

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GRADES

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3 - 5
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...mber?

e to receive:

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math

Suggestions

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Suggestions

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math games

math centers

math worksheets

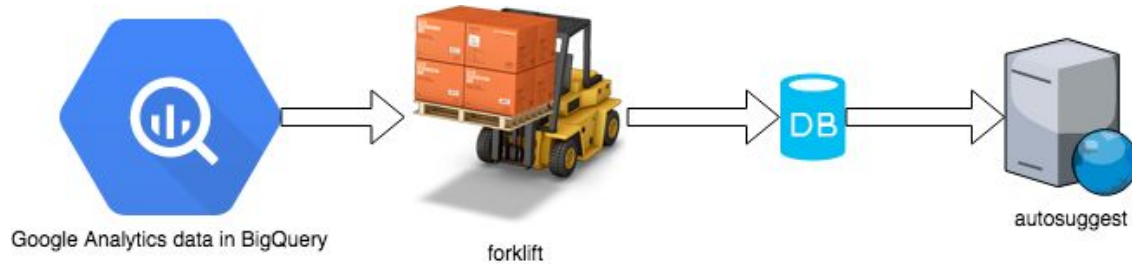**Sellers**

Math Mojo

Literacy and Math Ideas

Resource suggestions

Resources

Math Centers

See all results for **math**
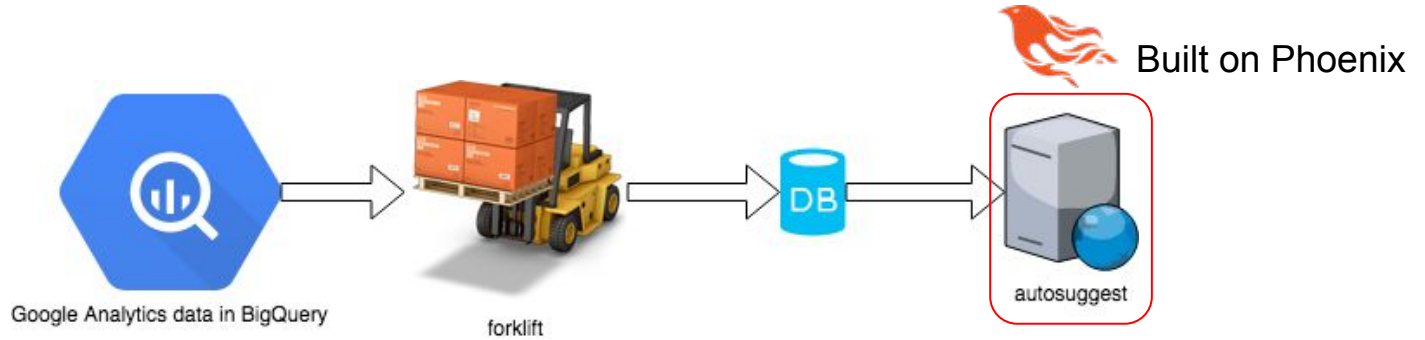
JSON returned from autosuggest

```
{
    "sellers": {
        "1": {
            "url": "/Store/Math-Mojo",
            "thumb_url": "https://ecdn.teacherspayteachers.com/thumbuserthumb/Math-Mojo-1520640523/460017.jpg",
            "text": "Math Mojo"
        },
        "2": {
            "url": "/Store/Math-Tech-Connections",
            "thumb_url": "https://ecdn.teacherspayteachers.com/thumbuserthumb/Math-Tech-Connections-1520628976/359717.jpg",
            "text": "Math Tech Connections"
        }
    },
    "resourcetypes": {
        "132": {
            "url": "/Browse/Type-of-Resource/Math-Centers",
            "name": "Math Centers"
        }
    },
    "list": [
        "st patricks day math",
        "math",
        "math games",
        "math centers",
        "math worksheets"
    ]
}
```

Process to power autosuggest

Google Analytics data in BigQuery   forklift   DB   autosuggest

Process to power autosuggest

Google Analytics data in BigQuery

forklift

Built on Phoenix

autosuggest

autosuggest

—

A standalone service built as a proof-of-concept for Elixir adoption at TPT

autosuggest

—

A standalone service built as a proof-of-concept for Elixir adoption at TPT

Thanks to Samira for owning this project 👏

Now the information retrieval
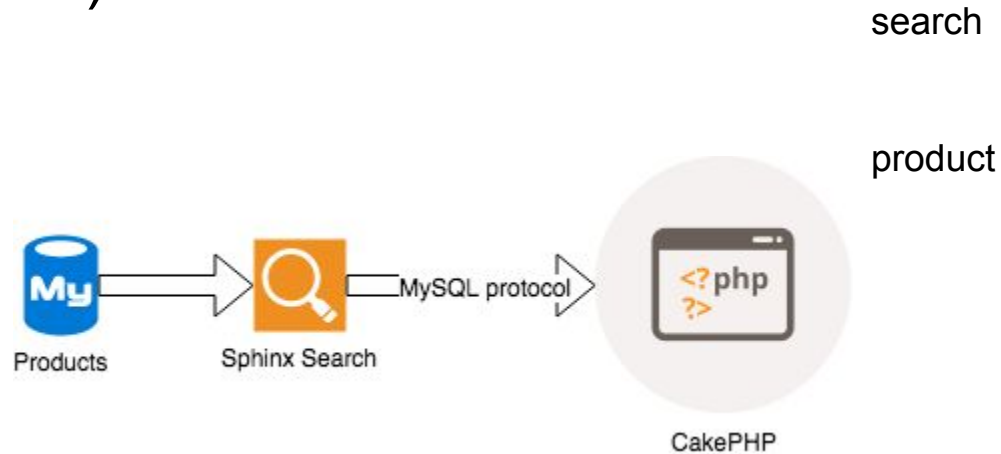
—

The search part

previous way to serve search
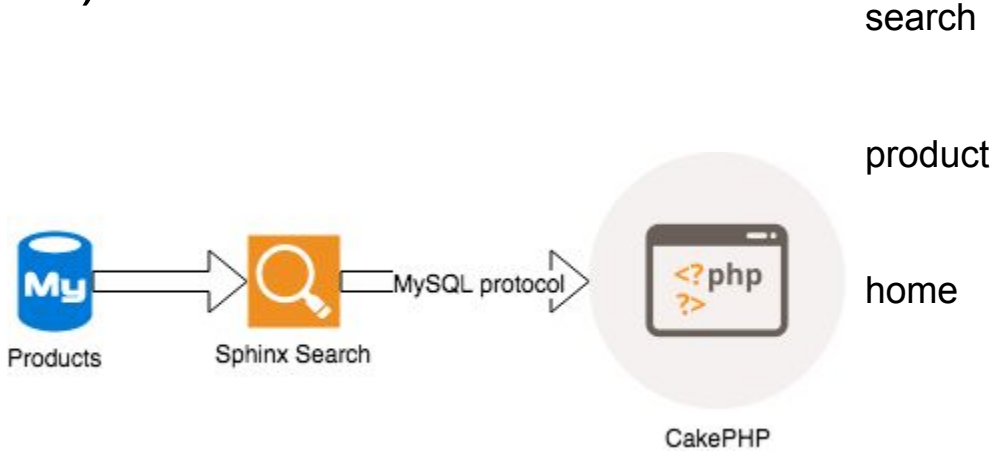(simplified)

previous way to serve search
(simplified)
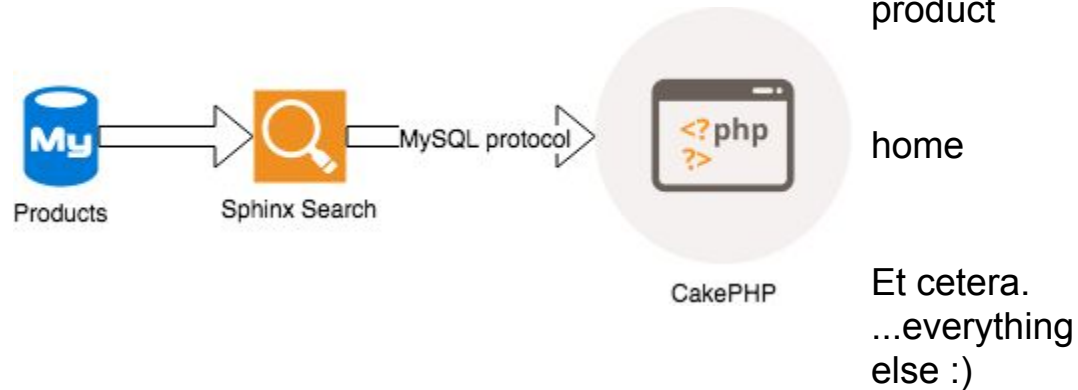
search

previous way to serve search
(simplified)

search

product

Products → Sphinx Search → MySQL protocol → CakePHP

previous way to serve search
(simplified)

search

product

home

Products → Sphinx Search —MySQL protocol→ CakePHP

previous way to serve search
(simplified)

search

product

Products → Sphinx Search → MySQL protocol → CakePHP
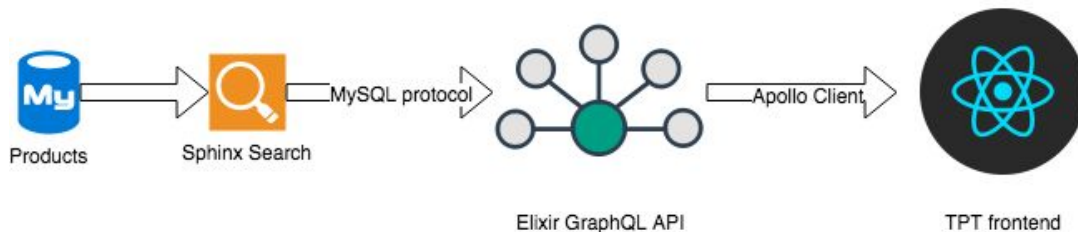
home

Et cetera. ...everything else :)

Implementing more elixir

—

A GraphQL API

Mixing in GraphQL

Mixing in GraphQL

And then this gave us more tools to debug and analyze search

Products → Sphinx Search —MySQL protocol→ Elixir GraphQL API —Apollo Client→ TPT frontend
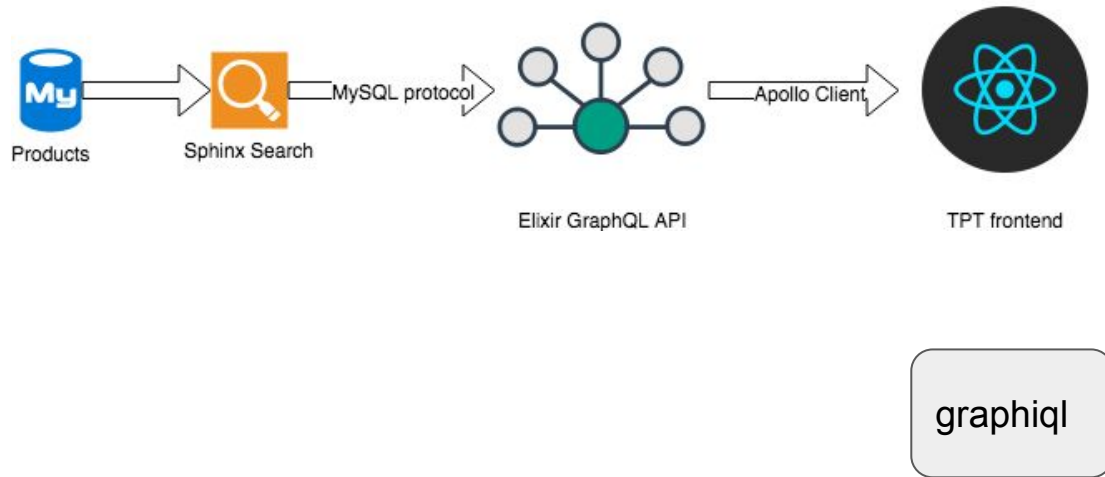
Mixing in GraphQL

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graphiql

Mixing in GraphQL

And then this gave us more tools to debug and analyze search

Products → Sphinx Search →MySQL protocol→ Elixir GraphQL API →Apollo Client→ TPT frontend

Search replayer
Built with Elixir
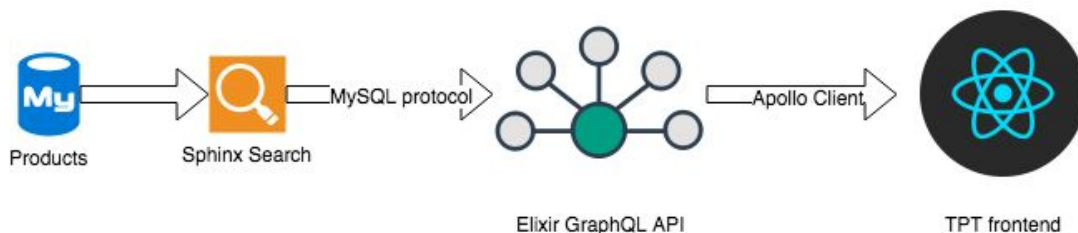running Cowboy
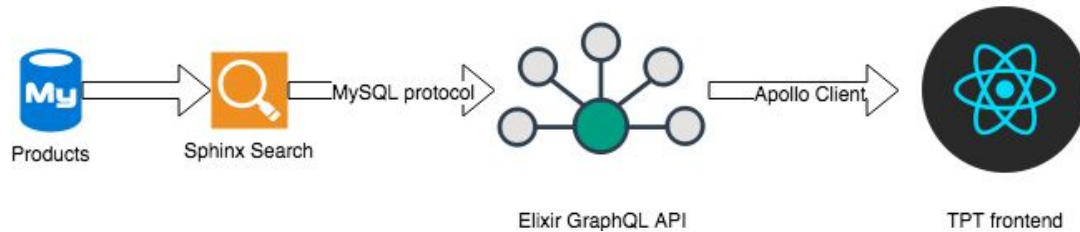
graphiql

Mixing in GraphQL

And then this gave us more tools to debug and analyze search

Mixing in GraphQL
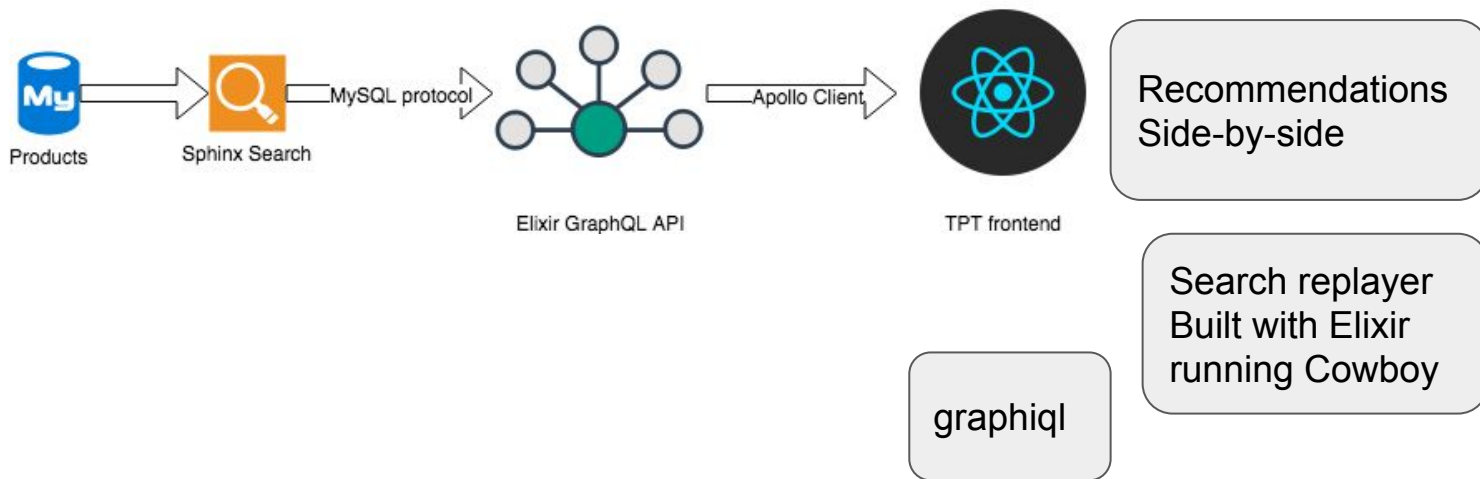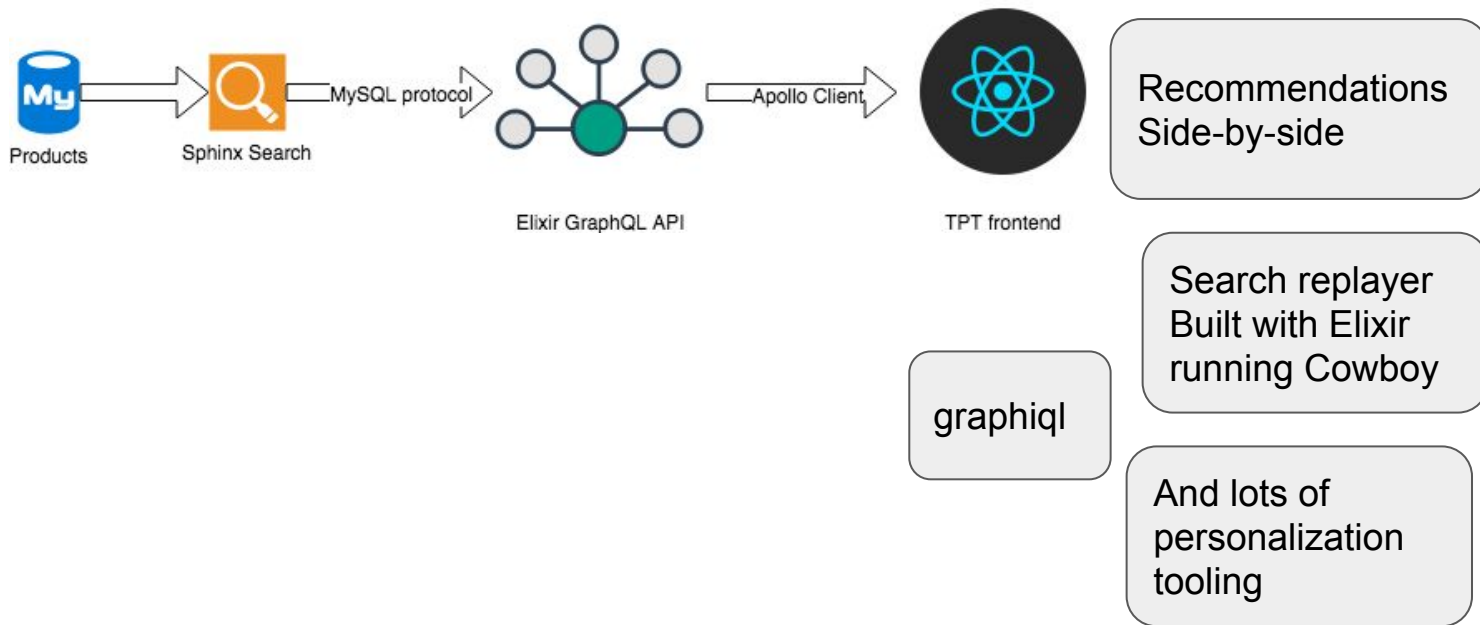
And then this gave us more tools to debug and analyze search

Products · Sphinx Search · MySQL protocol · Elixir GraphQL API · Apollo Client · TPT frontend

Recommendations
Side-by-side

Search replayer
Built with Elixir
running Cowboy

graphiql

And lots of
personalization
tooling

graphiql

graphiql

graphql query

graphiql

results

graphiql

Just with graphiql, search became easier to debug

graphiql

Just with graphiql, search became easier to debug

And also easier to test

```
test "facet on grade group should return grades in the resultFacets" do
    query = """
    query {
      searchProducts(query: "", limit: 5, facets: ["Grade-Level/1-2"]) {
        resultFacets {
          grades {
            id
          }
        }
      }
    }
    """
```

```elixir
assert {:ok, result} = Poison.Parser.parse(response.body)

assert Map.has_key?(result, "data")

assert not Map.has_key?(result, "errors")

search_results = result["data"]["searchProducts"]

obs_grades = search_results["resultFacets"]["grades"]

assert length(obs_grades) == 2

assert Enum.member?(obs_grades, %{"id" => "Grades_First"})

assert Enum.member?(obs_grades, %{"id" => "Grades_Second"})
end
```

Testing our Search terms also became easier!

Testing our Search terms also became easier!

We convert our search string into an AST (abstract syntax tree)

Typical unquoted text string

```
TptApi.SearchText.from_string("this and that")
{:ok, {:ast_and, [ast_word: 'this', ast_word: 'and', ast_word: 'that']}}
```

Quoted string

```
TptApi.SearchText.from_string(~s("this and that"))
{:ok, {:ast_quoted, 'this and that'}}
```

Advanced negative searching

```
TptApi.SearchText.from_string("this -that")
{:ok, {:ast_and, [ast_word: 'this', ast_not: {:ast_word, 'that'}]}}
```

We test a list of different search terms we support

```elixir
test "successfully parse nice inputs", %{nice_inputs: inputs} do
  for {input, expected} <- inputs do
    assert {:ok, expected} == TptApi.SearchText.from_string(input)
  end
end
```

That list looks similar to the following

```
[...
{"fractions \"cheese bananas\"", {:ast_and,
    [ast_word: 'fractions', ast_quoted: 'cheese bananas']}},
{"fractions -\"cheese bananas\"", {:ast_and,
    [ast_word: 'fractions', ast_not: {:ast_quoted, 'cheese bananas'}]}},
{"fractions \"cheese or bananas\"", {:ast_and,
    [{:ast_word, 'fractions'}, {:ast_quoted, 'cheese or bananas'}]}},
...]
```

Search analytics

—

Search is *not* easy

Search analytics

—

Search is *not* easy
But that's why we A/B test and look at a lot of data

Replay and SxS tool

A/B configuration

A weight expr: [ ] [▦]   B weight expr: [ ]
A rank expr: [ ]   B rank expr: [ ]
A abtests: [ ]   B abtests: [ ]

Grade facets:
```
Pre-K
Kindergarten
1st
2nd
```

Replayer Search terms / Browses

```
Top 100 (overall)
Top 100 (1 word)
Top 100 (2 words)
Top 100 (3 words)
```
[Replay]

Single query SxS

Query string: [ ]   [Show SxS]

Internal eval is important

Replay and SxS tool

A/B configuration

A weight expr: [   ] [▤]   B weight expr: [   ]
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[Replay]

Single query SxS

Query string: [   ]   [Show SxS]

Internal eval is important

replays Search or Browse graphql queries and gets aggregate data

Replay and SxS tool

Internal eval is important

A/B configuration

A weight expr: [   ] 🔖 B weight expr: [   ]
A rank expr: [   ] B rank expr: [   ]
A abtests: [   ] B abtests: [   ]

Grade facets:
```
Pre-K
Kindergarten
1st
2nd
```

Replayer Search terms / Browses

```
Top 100 (overall)
Top 100 (1 word)
Top 100 (2 words)
Top 100 (3 words)
```  [ Replay ]

Single query SxS

Query string: [   ] [Show SxS]

Side by Side search comparisons for A/B tests

Example on Replayer of Top 100 Browses

```
facets

|> Enum.map(&(Task.async(Replayer.Browse, :do_browse, [&1, cfg.a_url_params]))))

|> Enum.map(&Task.await/1)

|> update_with_rank()
```

```graphql
# Snippet of GraphQL query in Replayer.Browse.do_browse/2
    totalCount,

    results{

        type,

        url,

        name,

        description(maxLength: 300),

        images{large},

        downloads,

        views,

        votes,

        abbreviatedGrades,

        ratings{scoreAverage, count},

        sold,

        price,

        isFree,

        author{id, name, icon{location}}
# ... more code
```

Results

Wordlist	Name	Avg Price	WAD Price	Avg #Votes	Num Free	Num Paid	Unique Sellers	Avg Grades
Top 100 Browses	page1a	9.36	9.10	2912.34	2133	3015	704	4.25
Top 100 Browses	top5a	8.95	8.39	6090.01	206	289	129	4.71
Top 100 Browses	top1a	6.93	6.93	9141.51	39	60	34	6.30
Top 100 Browses	page1b	12.80	13.12	2927.67	2156	2992	693	4.32
Top 100 Browses	top5b	15.06	13.88	6118.35	209	286	130	4.83
Top 100 Browses	top1b	12.26	12.26	9179.24	40	59	34	6.06

*WAD: weighted average discount
Full disclosure: the data here does not represent what is in production :)

Mixing Elixir for tooling

—

Replaced PHP tooling

Mixing Elixir for tooling

—

Replaced PHP tooling

Also a great learning project for onboarding

Mixing Elixir for tooling

—

Replaced PHP tooling

Also a great learning project for onboarding

Thanks to Louis for bootstrapping this project 👏

Related searches

—

An SEO initiative

Related searches

—

An SEO initiative

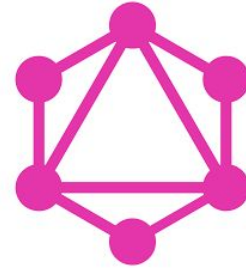Built easily in the new elixir platform

(refresher)

Autosuggest endpoint

(refresher)

Autosuggest endpoint

GraphQL API

```elixir
defp run_query(path) do
  uri =
    Application.get_env(:tpt_api, :autosuggest_api_root)
    <> "/#{path}"
    |> URI.parse()

  HTTPUtil.get_json!(uri, [], [timeout: @timeout, recv_timeout: @timeout])
end
```

Now on our Search pages in React

Related searches for *pi day*

pi day activities middle school

pi day activities

pi day activities elementary

pi day activities high school

showing 1-52 of **1,293** results

Elixir Mixed In

Elixir Mixed In

- Autosuggest helped push adoption forward

Elixir Mixed In

- Autosuggest helped push adoption forward
- GraphQL API provided great decoupling benefits

Elixir Mixed In

- Autosuggest helped push adoption forward
- GraphQL API provided great decoupling benefits
- Having engineers bootstrap Elixir projects provide good learning

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- engineering.teacherspayteachers.com

Thank You Code BEAM SF!

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