

# A DEEP DIVE INTO HEX

TODD RESUDEK

WAIT, IT'S MORE  
THAN MIX DEPS.GET ?

TODD RESUDEK

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Sr. Software Engineer



supersimple



@sprsmpl

# WHAT IS HEX?

Hex is the package manager for the Erlang ecosystem.

It is analogous to NPM for Node.js, Crates for Rust, and RubyGems for Ruby.

Hex was authored by Eric Meadows-Jönsson and first released December 23, 2013.

*The first release of Elixir (0.5.0) was May 24, 2012.*



## INTRODUCTION TO HEX

# HOW DOES IT COMPARE?

Number of packages available:

- ▶ Hex: ~6,000
- ▶ RubyGems: ~9,200
- ▶ Crates: ~14,000
- ▶ NPM: ~500,000

# WHY BECOME A POWER USER?

- ▶ Work faster
- ▶ Prevent issues
- ▶ Easier debugging

# ANATOMY OF A HEX PACKAGE

```
|— LICENSE.md
|— README.md
|— config
|   └─ config.exs
|— deps
|   └─ earmark
|   └─ ex_doc
|— doc
|   └─ 404.html
|   └─ Chameleon.html
|   └─ api-reference.html
|   └─ dist
...
|— doc (cont)
|   └─ fonts
|   └─ index.html
|   └─ search.html
|— lib
|   └─ chameleon
|   └─ chameleon.ex
|— mix.exs
|— mix.lock
└─ test
    └─ chameleon_test.exs
    └─ test_helper.exs
```



# ANATOMY OF A HEX PACKAGE

```
defmodule PackageName.MixProject do
  use Mix.Project
  def project() do
    [
      app: :packagename,
      version: "0.1.0",
      ...
      description: description(),
      package: package(),
      deps: deps(),
      name: "PackageName",
      source_url: "https://github.com/username/packagename"
    ]
  end
end

...

defp deps() do
  [
    {:ex_doc, "~> 0.14", only: :dev},
    {:foobar, git: "https://github.com/elixir-lang/foobar.git", tag: "0.1"},
    {:foobar, path: "path/to/foobar"}
  ]
end

defp description() do
  "A few sentences (a paragraph) describing the project."
end

defp package() do
  [
    name: "packagename",
    files: ["lib", "mix.exs", "README*", "LICENSE*"],
    maintainers: ["John Smith", "Rose Jones"],
    licenses: ["GPL 3.0"],
    links: %{"GitHub" => "https://github.com/org/packagename"},
    organization: "my-org"
  ]
end
end
```

# ANATOMY OF A HEX PACKAGE

```
def project() do
  [
    app: :packagename,
    version: "0.1.0",
    ...
    description: description(),
    package: package(),
    deps: deps(),
    name: "PackageName",
    source_url: "https://github.com/username/
packagename"
  ]
end
```

# ANATOMY OF A HEX PACKAGE

```
defp description() do  
  "A few sentences (a paragraph) describing the  
  project."  
end
```

# ANATOMY OF A HEX PACKAGE

```
defp deps() do
  [
    {:ex_doc, "~> 0.14", only: :dev},
    {:foobar, git: "https://github.com/
elixir=lang/foobar.git", tag: "0.1"}
    {:foobar, path: "path/to/foobar"}
  ]
end
```

# ANATOMY OF A HEX PACKAGE

```
defp package() do
  [
    name: "packagename",
    files: ["lib", "mix.exs", "README*", "LICENSE*"],
    maintainers: ["John Smith", "Rose Jones"],
    licenses: ["GPL 3.0"],
    links: %{"GitHub" => "https://github.com/org/
packagename"}
    organization: "my-org"
  ]
end
```

# ANATOMY OF A HEX PACKAGE

```
defp package() do
  [
    name: "packagename",
    files: ["lib", "mix.exs", "README*", "LICENSE*"],
    maintainers: ["John Smith", "Rose Jones"],
    licenses: ["GPL 3.0"],
    links: %{"GitHub" => "https://github.com/org/
packagename"}
    organization: "my-org"
  ]
end
```

# PACKAGE NAMING

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*Avoid using offensive or harassing package names, nicknames, or other identifiers that might detract from a friendly, safe, and welcoming environment for all.*

---

# NAMING CONVENTIONS

- ▶ When adding functionality to an existing package, use that package's name in your package name.
- ▶ Avoid namespace conflicts with existing packages.
- ▶ When porting a library from another ecosystem, add “ex” to the name.
- ▶ First come first serve
- ▶ Squatting is not allowed



WHAT HEX COMMANDS  
SHOULD YOU KNOW?

# SECTION 1: WORKS ON MY MACHINE



# MIX HEX.INFO

Hex: 0.17.3

Elixir: 1.6.1

OTP: 20.1

Built with: Elixir 1.6.1 and OTP 20.1

A new Hex version is available (17.3 < 17.4)  
please update with `mix local.hex`

# MIX HEX.INFO <PACKAGE>

Create an alphabetical hash. Taking an existing alphabetic hash (of any length), will return the next hash in sequence. If all characters in hash are rolled over, will append a new char (increase the length by 1.)

eg. 'ZZZZ' -> 'AAAAA' eg. 'AAAZ' -> 'AABA'

Config: { :alphabetify, "~> 1.0" }

Releases: 2.0.0-rc1, 1.0.3, 1.0.2, 1.0.1, 1.0.0, 0.1.0 (retired)

Maintainers: Todd Resudek

Licenses: GPL 3.0

Links:

GitHub: <https://github.com/supersimple/alphabetify-ex>

# MIX HEX.INFO <PACKAGE> <VERSION>

Config: { :honeybadger, "~> 0.8.0" }

Documentation at: <https://hexdocs.pm/honeybadger/0.8.0>

Dependencies:

hackney ~> 1.1

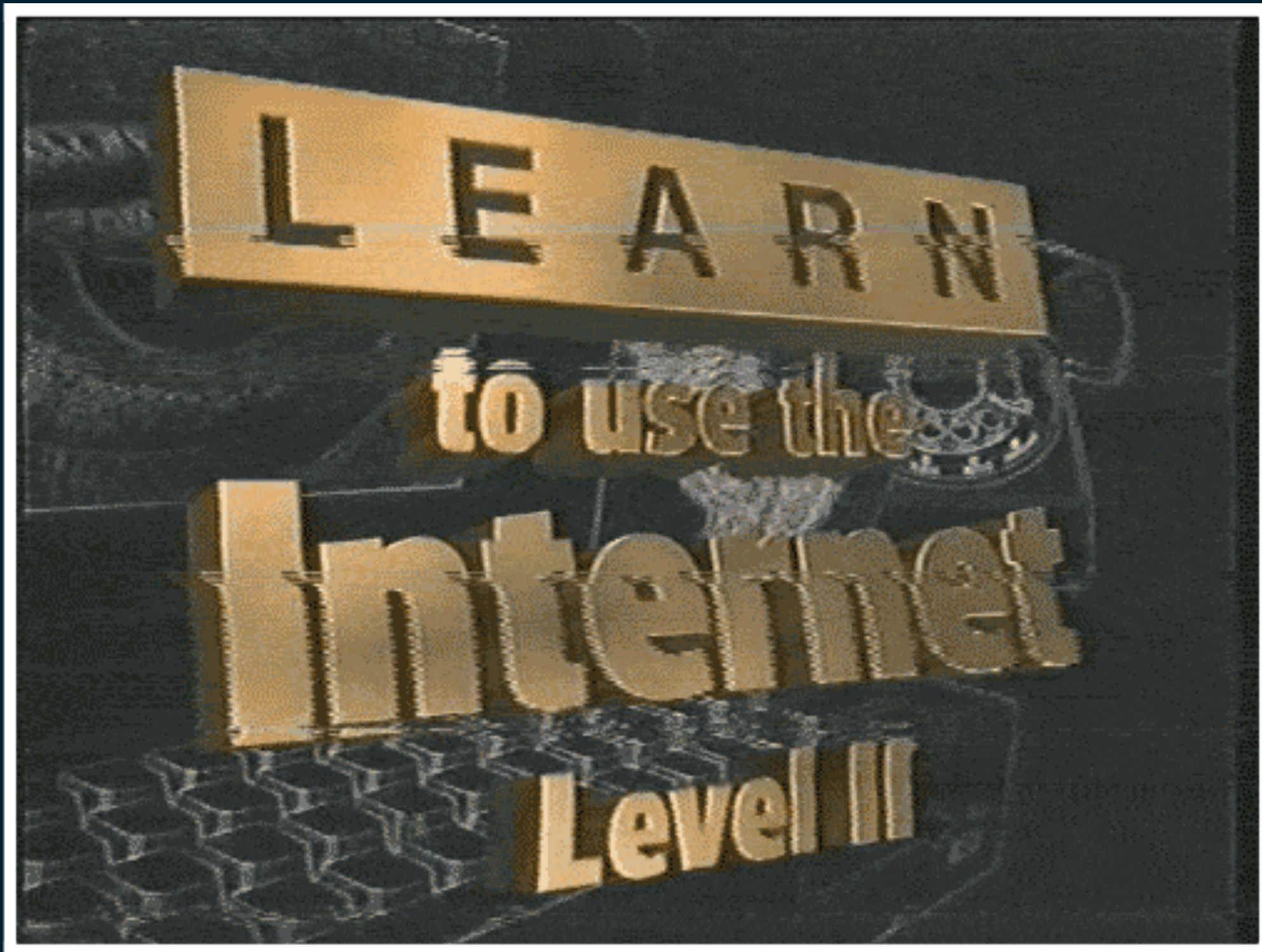
phoenix >= 1.0.0 and < 2.0.0 (optional)

plug >= 1.0.0 and < 2.0.0 (optional)

poison ~> 2.0 or ~> 3.0



# SECTION 2: LEARN



# MIX HEX.SEARCH <TERM>

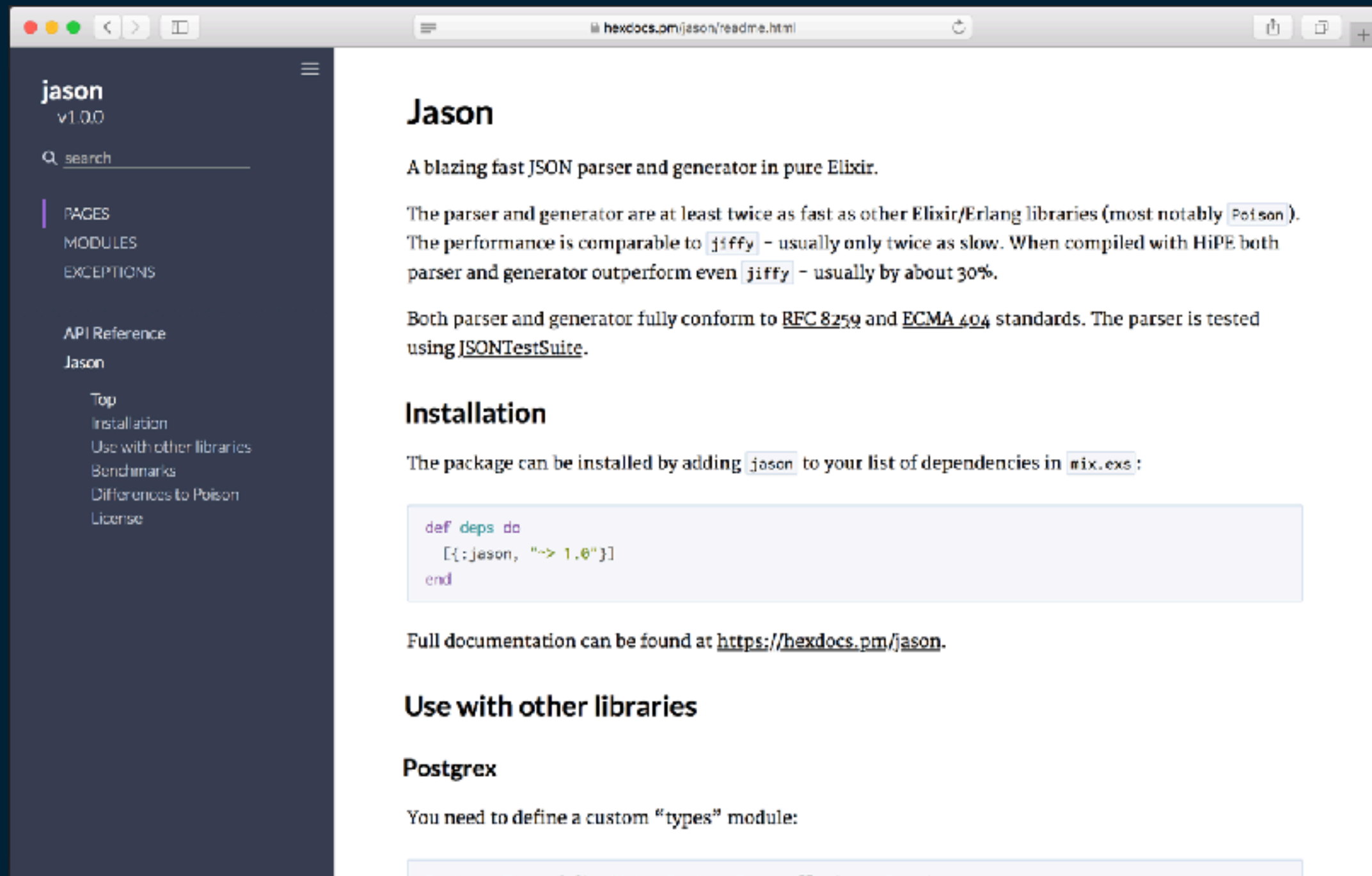
Package	Version	URL
-----	-----	---
iso_erlang	0.11.0	<a href="https://hex.pm/packages/iso_erlang">https://hex.pm/packages/iso_erlang</a>
png	0.1.1	<a href="https://hex.pm/packages/png">https://hex.pm/packages/png</a>
alphanumeric	0.1.0	<a href="https://hex.pm/packages/alphanumeric">https://hex.pm/packages/alphanumeric</a>
deviant_elixir	0.0.4	<a href="https://hex.pm/packages/deviant_elixir">https://hex.pm/packages/deviant_elixir</a>
alphabetify	1.0.3	<a href="https://hex.pm/packages/alphabetify">https://hex.pm/packages/alphabetify</a>
iso_3166	1.0.0	<a href="https://hex.pm/packages/iso_3166">https://hex.pm/packages/iso_3166</a>
evil_clock	0.1.0	<a href="https://hex.pm/packages/evil_clock">https://hex.pm/packages/evil_clock</a>

# MIX HEX.DOCS ONLINE <PACKAGE>

- ▶ `["eex", "elixir", "ex_unit", "iex", "logger", "mix"]` retrieve the version that matches your current elixir version.
- ▶ Dependencies in your app will open app version.
- ▶ Defaults to latest version unless you specify.



# MIX HEX.DOCS ONLINE JASON



# MIX HEX.DOCS FETCH

- ▶ Downloads docs for all dependencies in your current app.
- ▶ If called outside of an app, raises an error.

# MIX HEX.DOCS FETCH

```
Terminal — -bash — 110x30
[resudek@todds-macbook:platform (develop=)]$ mix hex.docs fetch
Couldn't find docs for package with name metrics or version 1.0.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/stubr/1.5.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/statix/1.1.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/meck/0.8.9
Docs fetched: /Users/resudek/.hex/docs/hexpm/new_relixir/0.4.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/amqp/0.2.4
Couldn't find docs for package with name weedmaps_schema or version 2.10.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/exprotobuf/1.2.9
Docs fetched: /Users/resudek/.hex/docs/hexpm/swoosh/0.13.0
Couldn't find docs for package with name elixir_make or version 0.4.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/exjsx/4.0.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/node_manager/0.1.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/absinthe/1.4.7
Docs fetched: /Users/resudek/.hex/docs/hexpm/ecto_enum/1.1.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/ecto/2.2.8
Docs fetched: /Users/resudek/.hex/docs/hexpm/comeonin/3.2.0
Couldn't find docs for package with name gpb or version 3.28.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/cors_plug/1.5.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/arc/0.8.0
Docs fetched: /Users/resudek/.hex/docs/hexpm/mmdb2_decoder/0.1.0
Couldn't find docs for package with name jsx or version 2.8.3
Docs fetched: /Users/resudek/.hex/docs/hexpm/phoenix_pubsub/1.0.2
Docs fetched: /Users/resudek/.hex/docs/hexpm/secure_random/0.5.1
Couldn't find docs for package with name mapbox_ex or version 0.2.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/amqp_client/3.6.15
Docs fetched: /Users/resudek/.hex/docs/hexpm/decimal/1.4.1
Docs fetched: /Users/resudek/.hex/docs/hexpm/jose/1.8.4
Couldn't find docs for package with name credo or version 0.8.10
Couldn't find docs for package with name cowboy or version 1.1.2
```

# MIX HEX.DOCS FETCH <PACKAGE>

- ▶ Downloads documentation to your hex home folder.
- ▶ Default location is: ~/.hex/docs/ORG/PACKAGE/VERSION/

# MIX HEX.DOCS OFFLINE <PACKAGE>

- ▶ Looks in hex home folder for downloaded documentation.
- ▶ If it exists, opens in a browser.
- ▶ If not, it downloads the documentation from hex.pm, then opens in a browser.

# ADDING THE —LATEST FLAG

- ▶ Add to fetch, offline, or online tasks
- ▶ Overrides any other logic and finds latest stable release.



# SECTION 3: GET READY



# MIX HEX.USER REGISTER

By registering an account on Hex.pm you accept all our policies and terms of service found at <https://hex.pm/policies>

Username: someuniqueusername

Email: [some-unique@email.com](mailto:some-unique@email.com)

Account password: \*\*\*\*\*

Account password (confirm): \*\*\*\*\*

- ▶ Username must be at least 3 characters in length.
- ▶ Username can contain letter, numbers, and some symbols. (underscores, hyphens, periods, or parens.)



# MIX HEX.USER RESET\_PASSWORD LOCAL

- ▶ Your local password is stored in `~/.hex/hex.config` as *encrypted\_key*
- ▶ Password is encrypted using the A256CBC algorithm (*but will be updated to A256GCM once support for OTP17 is dropped.*)

# MIX HEX.USER RESET\_PASSWORD ACCOUNT

- ▶ Sends email to reset password.
- ▶ *May invalidate locally stored API keys.*

# MIX HEX.USER KEY — LIST

<u>Name</u>	<u>Created at</u>
supersimple	2018-01-25T05:28:42
supersimple-supersimple-organization	2018-01-25T05:28:49
supersimple-weedmaps-organization	2018-01-25T05:28:49

# MIX HEX.USER KEY — REVOKE <KEYNAME>

- ▶ Removes one local API key

# MIX HEX.USER KEY — REVOKE-ALL

- ▶ Removes all local API keys

# MIX HEX.USER AUTH

- ▶ Regenerates all of your locally stored API keys.

# MIX HEX.CONFIG

```
username: supersimple
```

```
offline: "false"
```

Pulls data from your local config file, located at:  
~/.hex/hex.config

# HEX.CONFIG FILE

```
{username, <<"supersimple">>}
```

```
{offline, <<"false">>}.
```

```
{'$encrypted_key', <<"g123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789WRtAAAWoN0AABGQAA2FsZ20AAAALUEJFUzItSFM1MTJkAANlbmNtAAAADUEyNTZDQkMtSFM1MTJkAANwMmNiAACAGQAA3Ayc20AAAAQm6oarvQN_FhuRRs7RrQF0w">>}.}
```

```
{ '$repos' , # { << "hexpm:supersimple" >> =>
```

```
# {auth_key => <<"123456789123456789123456789123456789">>,
```

public\_key =>

```
<<"-----BEGIN PUBLIC KEY-----
```

```
\nMIIBI123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789123456789+  
\n123456789123456789123456789123456789123456789123456789123456789\n3rS9+DPlnfG8hBvGi6tvQIUzMxGCxF/73hU0/1234567891234567891234567891234567891234567891234567891234567891234567895pESgiwf2YC/  
2MGDXjAJfpfCd0RpLdvd4eRixTvLE9qO9bND94E7PgQ/  
xqZ\nJ1i2xWFndWa6nfFnRxZmCStCOZWYYPlaxr+FZceFbpMwzTNs4g3d4tLNUcbKAIH4\n0wIDAQAB\n-----END PUBLIC KEY--  
\n">>
```

```
url => <<"https://repo.hex.pm/repos/supersimple">>},
```

```
<<"hexpm:weedmaps">> =>
```

```
# {auth_key => <<"123456789123456789123456789123456789">>,
```

```
public_key => nil,
```

```
url => <<"https://repo.hex.pm/repos/weedmaps">>}}}}.
```



# MIX HEX.CONFIG <KEY>

Valid keys are:

- ▶ api\_url
- ▶ offline
- ▶ unsafe\_https
- ▶ unsafe\_registry
- ▶ http\_proxy
- ▶ https\_proxy
- ▶ http\_concurrency
- ▶ http\_timeout

# MIX HEX.CONFIG <KEY>

```
mix hex.config <key> <value>
```

Sets or resets a config

```
mix hex.config <key> -delete
```

Removes an existing config

# SECTION 4: DEFENSE



# MIX HEX.OUTDATED

Dependency	Current	Latest	Update possible
-----	-----	-----	-----
alphabetify	0.1.0	1.0.3	No
earmark	1.2.3	1.2.4	Yes
ex_doc	0.18.1	0.18.1	

# MIX HEX.OUTDATED <PACKAGE>

There is newer version of the dependency  
available 0.13.4 > 0.13.0!

Source	Requirement
-----	-----
ecto	~> 0.13.0
ecto_enum	~> 0.13.0
geo_postgis	~> 0.13
scrivener_ecto	0.13.0

# MIX HEX.AUDIT

Dependency	Version	Retirement reason
-----	-----	-----
alphabetify	0.1.0	(other) last_hash/1...

Found retired packages



# SECTION 5: CONTRIBUTING



# MIX HEX.PUBLISH

- ▶ Requires you to be a registered hex user.
- ▶ Generates and publishes docs by default.
- ▶ Use `—organization` flag to publish privately.
- ▶ Watch out for pre-release dependencies.



# TYPO SQUATTING

- ▶ New package names are checked for similarity with existing packages.
- ▶ Does not apply to private repositories.

# MIX HEX.PUBLISH —REVERT <VERSION>

- ▶ Use when you find an error in your package code.
- ▶ Only available within 1 hour of publishing.
- ▶ Not required for errors in documentation.

# MIX HEX.PUBLISH DOCS

- ▶ Available anytime after package release.
- ▶ Documentation is available at: `hexdocs.pm/my_package/1.0.0`
- ▶ `hexdocs.pm/my_package` redirects to latest version

# MIX HEX.RETIRE

- ▶ Added in v0.15.0 (released Dec 24, 2016)
- ▶ Signifies a package is no longer recommended.
- ▶ Retirement must include a valid reason:
  - ▶ Renamed
  - ▶ Deprecated
  - ▶ Security
  - ▶ Invalid
  - ▶ Other

# MIX HEX.RETIRE

`mix hex.retire alphabetify 0.1.0 other —message “some reason here.”`

`mix hex.retire alphabetify 0.1.0 —unretire`

# ORGANIZATIONS

- ▶ Added in v0.17.1 (released Aug 29, 2017)
- ▶ Still in private beta.
- ▶ Expect pricing per user.

# ORGANIZATIONS

## Members

Here you control your organization members and their roles. Mouse-over the role for more details.



supersimple

Admin ▾

Remove

Admin ▴ ▾

Add member

## Packages

alphabetify

chameleon

# MIX HEX.ORGANIZATION AUTH <ORG>

- ▶ Authorizes your local user for an organization
- ▶ Can use DEAUTH to remove your user.
- ▶ `mix hex.organization list` shows currently authorized organizations.



# SECTION 6: JOIN IN



# GET INVOLVED!

- ▶ Star or follow the repo on github.
- ▶ Submit an issue.
- ▶ Open a pull request to fix a current issue.

# weedmaps



  [github.com/hexpm/hex](https://github.com/hexpm/hex)

## CREDITS & NOTES