TypeScript in Practice: Best Practices

Project-level Best Practices

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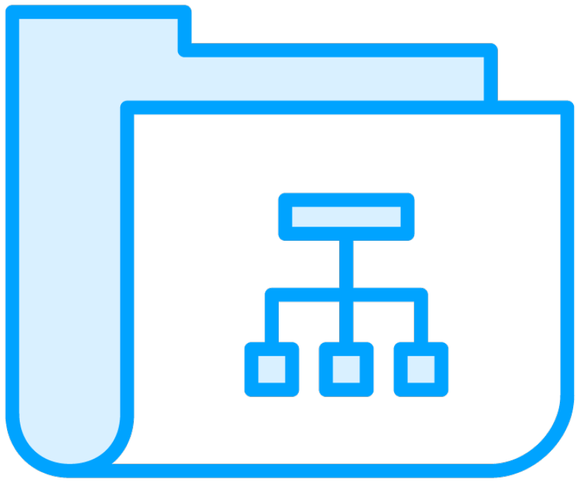
Senior Front-end Developer

Structural Best Practices

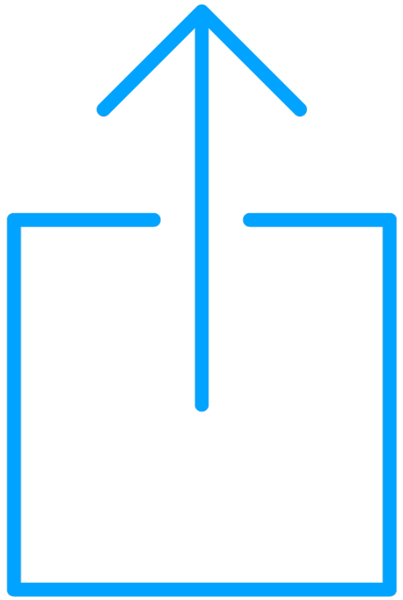
There Is No One True Folder Structure to Rule Them All!



File and folder structure will depend on:

- The nature of the project
- Any frameworks in use
- Personal preference

Remember the LIFT Principle

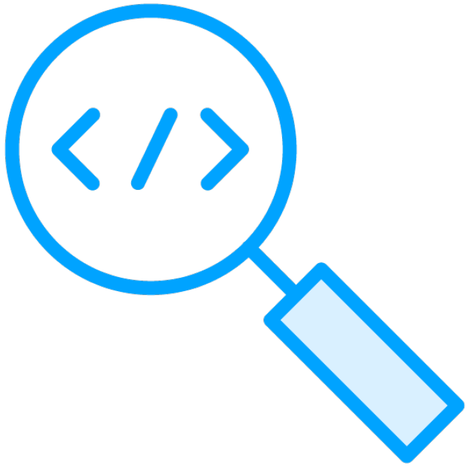


- **L**ocatable
- **I**dentifiable
- **F**lat
- **T**ry to stay DRY

Locatable

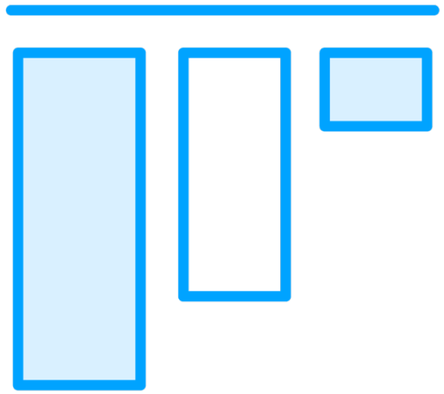
- Code Should be easy to find
- Name folders and files to promote findability

Identifiable



- It should be easy to see which codes are in which files, and which files are in which folders

Flat



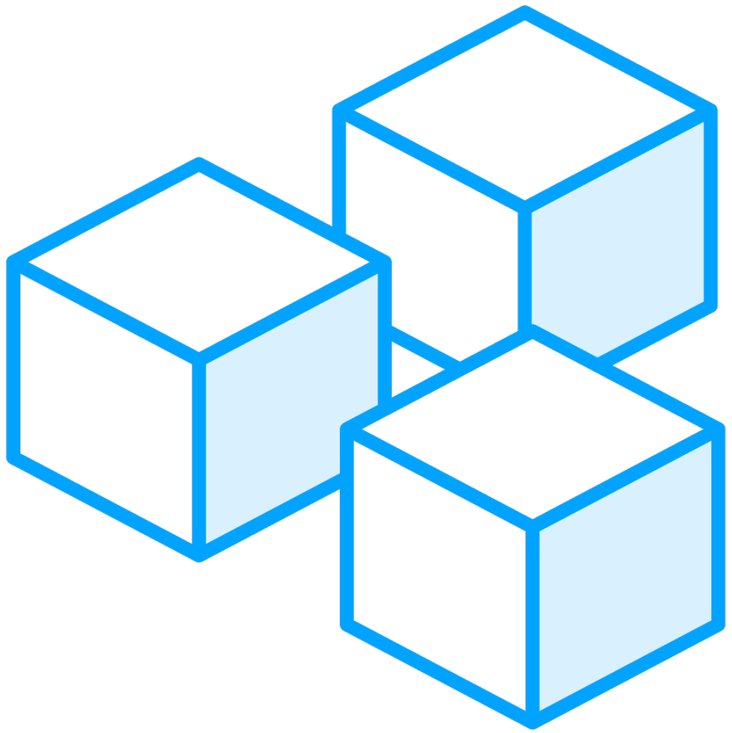
- Keep the folder structure as flat as possible, with only as much nesting as required

Try to Stay DRY

- **D**on’t **R**epeat **Y**ourself
- Avoid duplicating files of the same purpose and scope in multiple places
- Applies more to code but keep it in mind

Architectural Best Practices

Favor a Modular Design



- Code in discreet modules is easier to reuse throughout the application
- Modules should adhere to the single responsibility principle

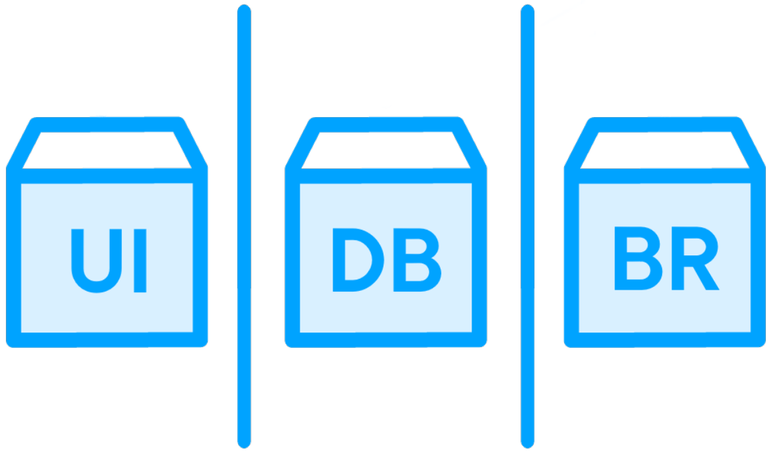
Functions should do one thing and do it well!

(Functions/classes/modules)

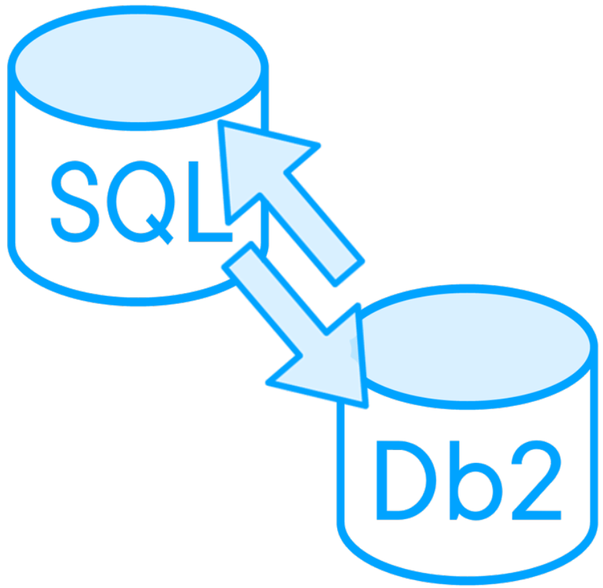
Robert C Martin

The number one best practice for architecture is the separation of concerns.

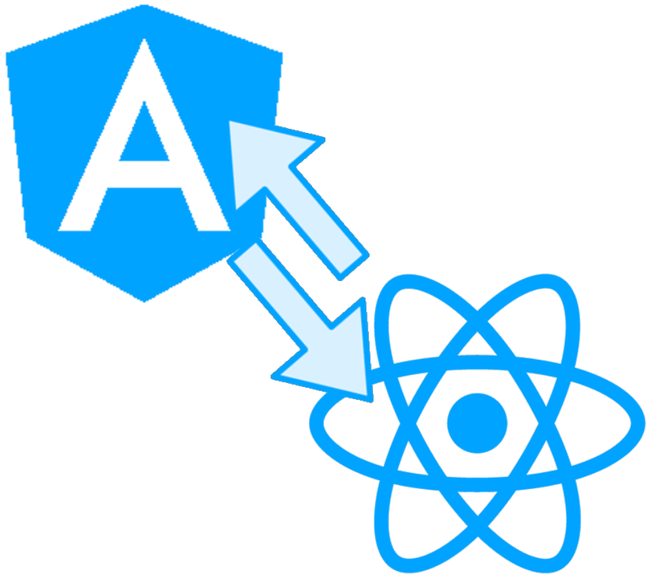
- Different parts of our application



- Different parts of our application should be separated by clear and distinct boundaries

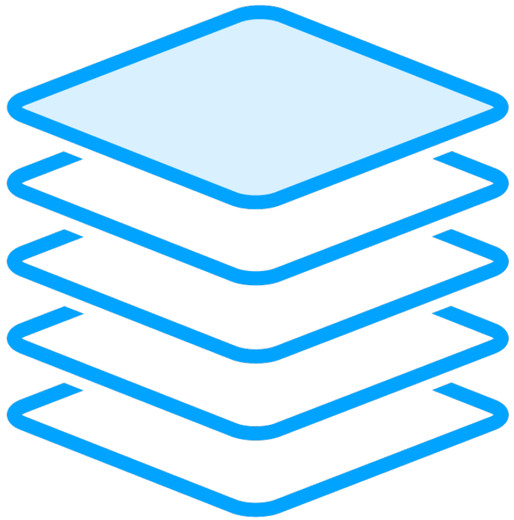


- You don’t want to have to change your UI if you just want to change your database



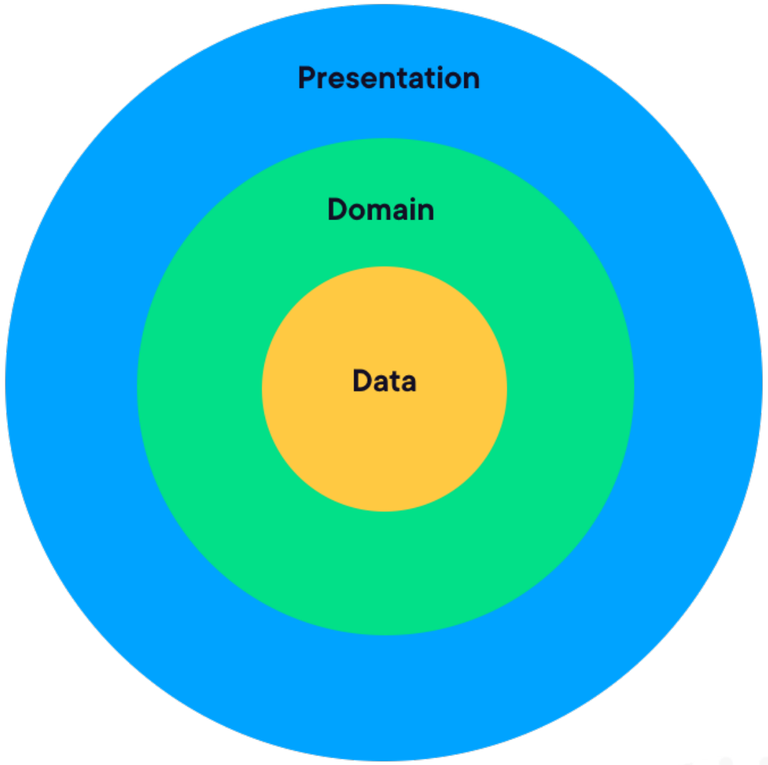
- You shouldn’t have to rewrite your whole application just to change the UI framework

Favor a Layered Design

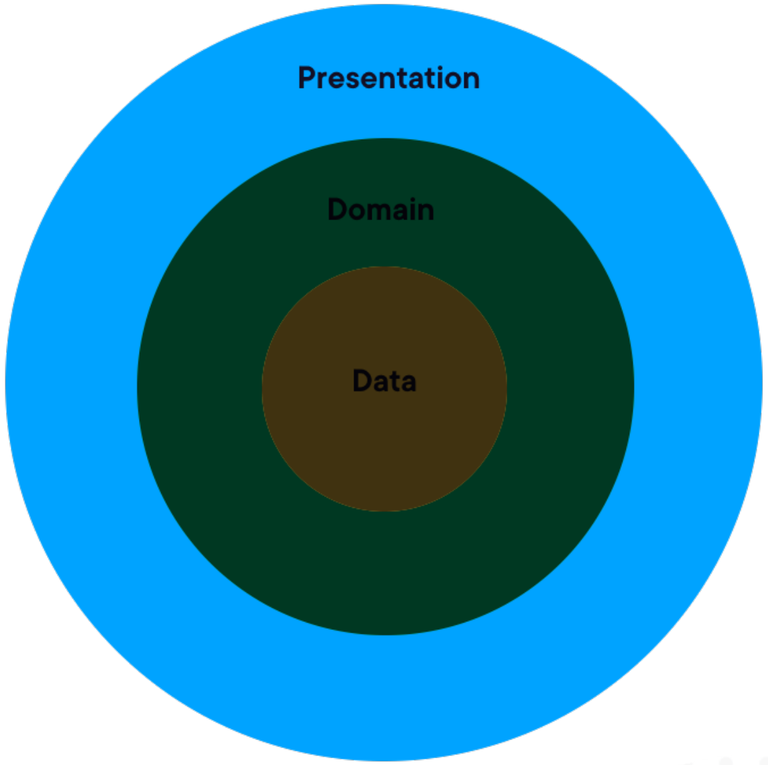


- Divide the application into distinct layers, each responsible for a different thing
- Minimize dependencies between layers

Application Architecture

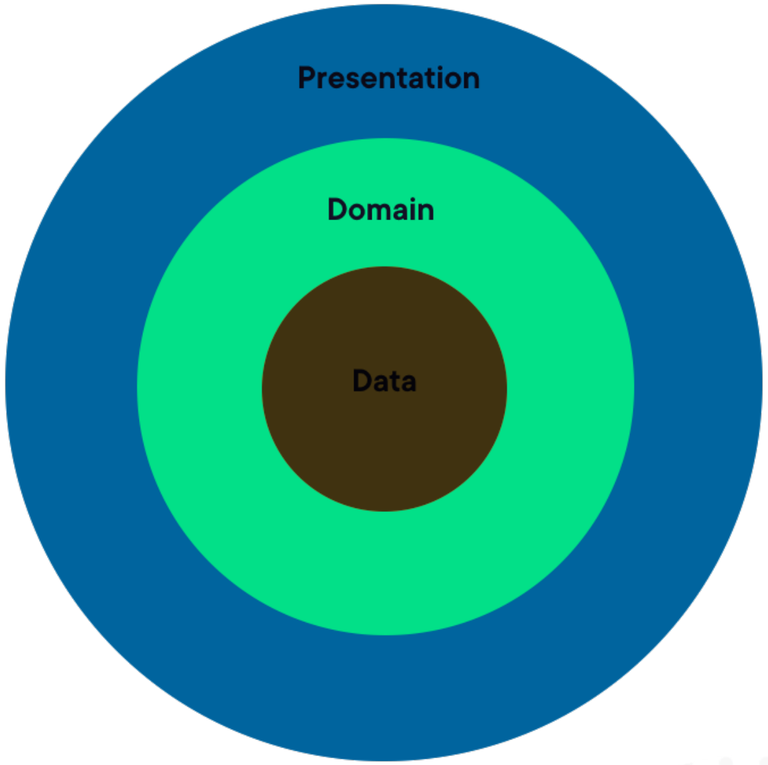


Presentation Layer



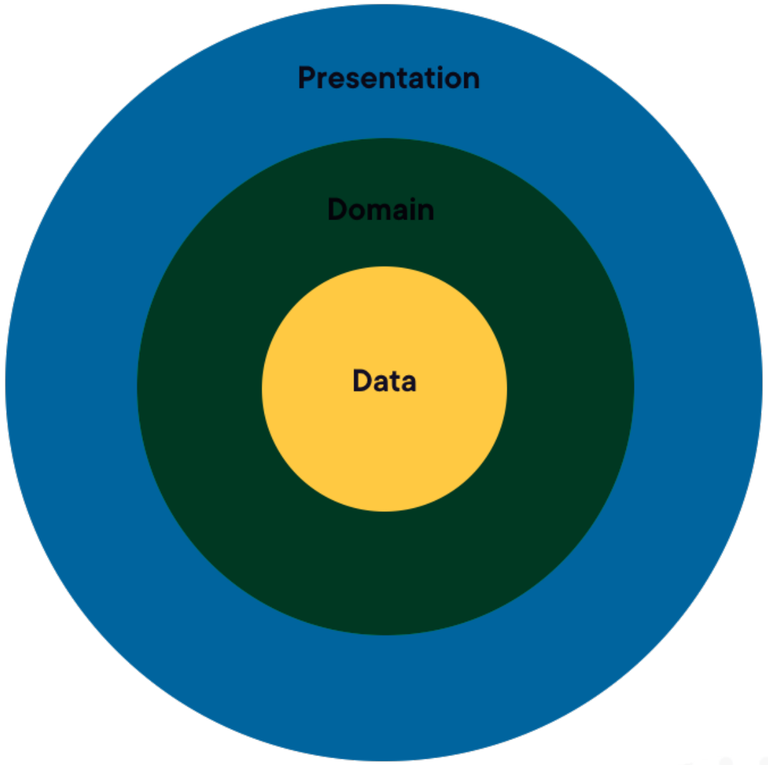
- UI components, framework

Domain Layer



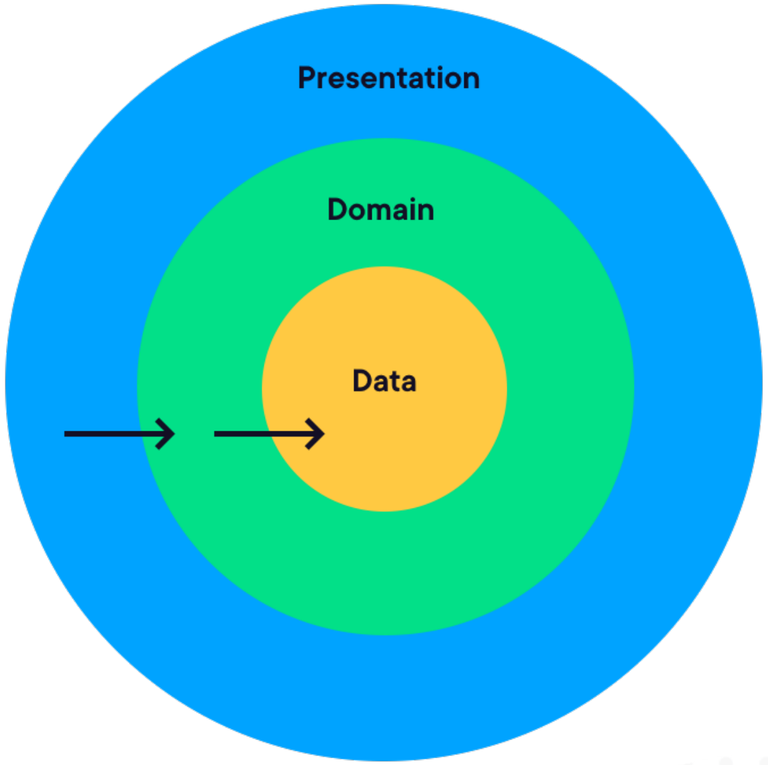
- UI components, framework
- Entities, business logic, use-cases

Data Layer



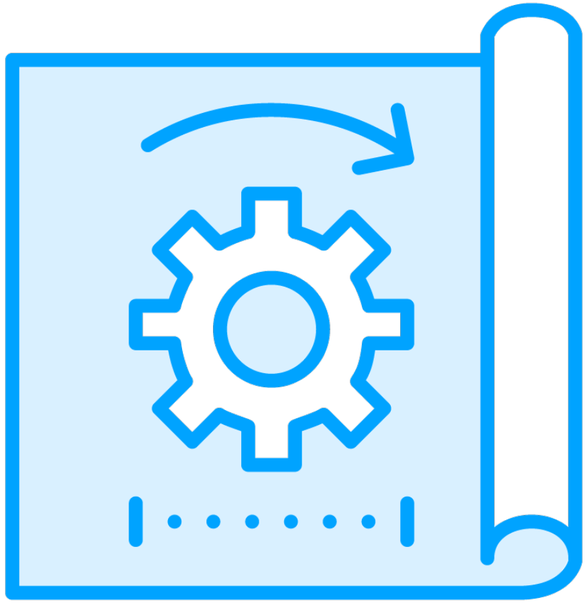
- UI components, framework
- Entities, business logic, use-cases
- Storing/retrieving data

Dependency Rule



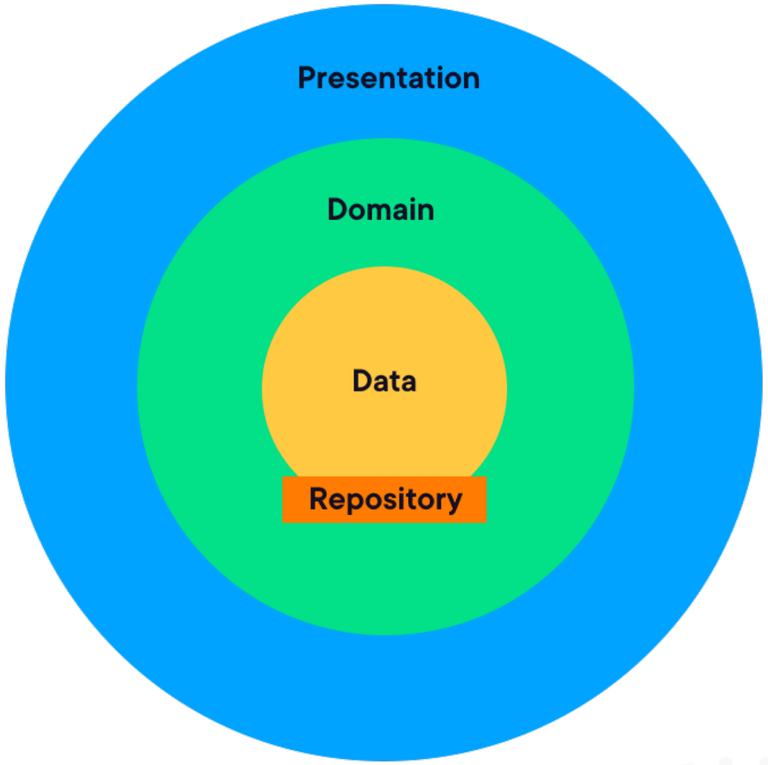
- Dependencies should always point in
- Dependencies should be one level deep

Domain-driven Development



- First, design the core entities of the application and their behaviors and interactions
- Build the application around these

Repository



- UI components, framework
- Entities, business logic, use-cases
- Storing/retrieving data
- A bridge between domain/data layers

Repository – interact with a data source without knowing too much about it.

Best practices are just guidelines.

You can deviate from them in limited and specific ways.

More Information:

Clean Architecture: Patterns, Practices, and Principles

Matthew Renze

Configuration Best Practices

TypeScript Configuration

- TypeScript apps are configured using one or more `tsconfig` files

Always enable strict mode in new TypeScript applications!

TypeScript Configuration

- TypeScript apps are configured using one or more `tsconfig` files
- New projects have strict mode enabled by default
- Purpose of strict mode is to allow older projects to be incrementally made strict

Strict Mode Is an Umbrella For

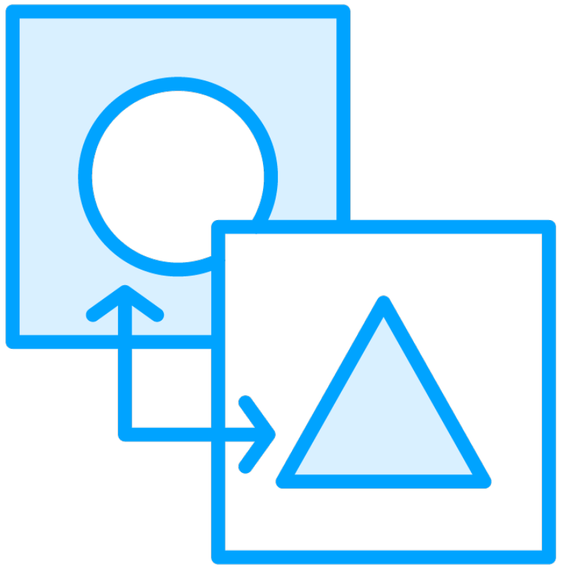
- alwaysStrict
- strictNullChecks
- strictBindCallApply
- strictBuiltInIteratorReturn
- strictFunctionTypes
- strictPropertyInitialization
- noImplicitAny
- noImplicitThis
- useUnknownInCatchVariables

Without strict mode, you lose much of TypeScript's power.

Additional Type-checking Options

- noImplicitOverride
- noImplicitReturns
- noPropertyAccessFromIndexSignature
- noUncheckedIndexedAccess
- noFallThroughCasesInSwitch
- noUnusedLocals
- noUnusedParameters
- exactOptionalPropertyTypes

TSC Compilation



- By default, TSC emits compiled files next to the original source file
- This can quickly clutter up the project with development/distributable files
- Separation makes tasks like source control and releases easier

TypeScript Configuration

- TypeScript supports a wide range of configuration options to suit all projects
- Starting a project with maximum strictness/cleanliness options enabled gives a solid and safe foundation

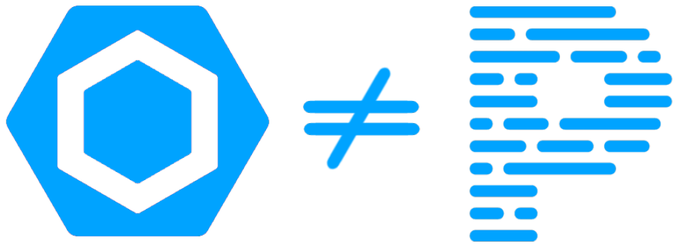
Tooling Best Practices

Source control and a TypeScript-aware editor are a given in terms of tooling.

Install a static code analysis tool to check for common errors.

Install a formatter for consistency in multi-developer projects.

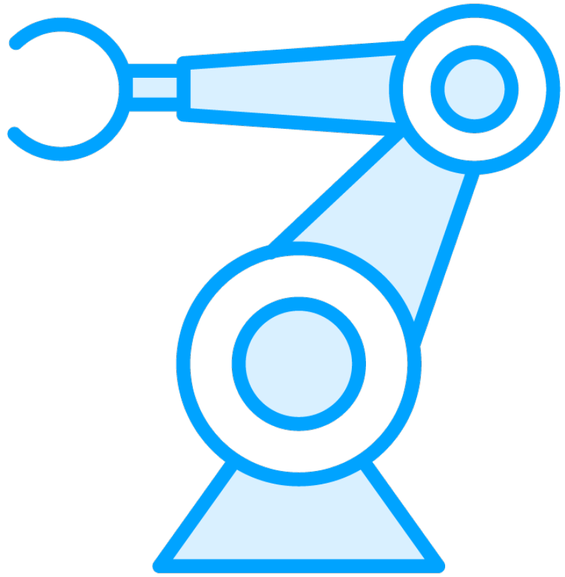
Linters vs. Formatters



- Linters and formatters are not the same thing, although there can be overlap
- Formatters are concerned with the presentation of code in files
- We can configure whether semi-colons are added at line ends, tabs vs. spaces, etc.

Automate linting and formatting tasks.

Automation Options



Editor integration

- Run Prettier on every file save
- Show lint warnings as you code

Git hooks

- Pre-commit