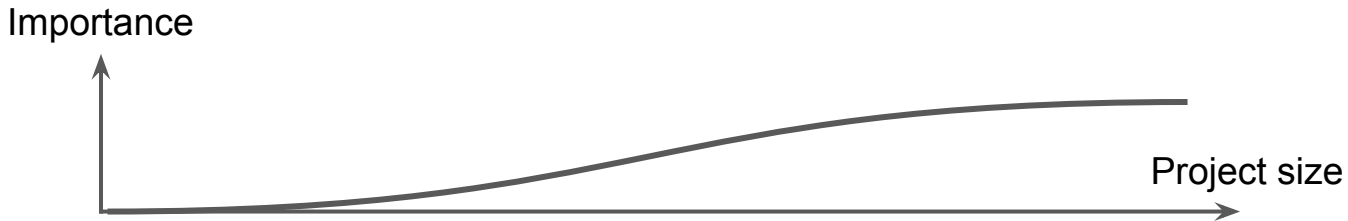


Dependency Injection (DI)

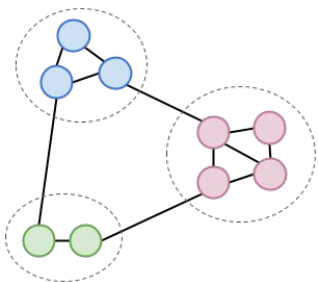
with dependency-injector



Build software that is easy to change!

Reduce mental load

Reduce fear of change



High cohesiveness

Low coupling



Single Responsibility (SOLID)



Create pressure in the fuel system

Store fuel

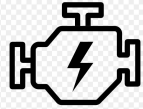
Interface Segregation (SOLID)

So you are an engine? There is a fuel pump for you!



Dependency Inversion (SOLID)

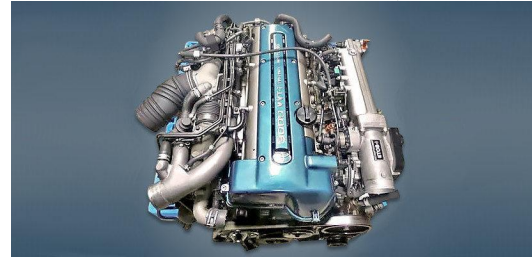
I need an



I need a Toyota 2JZGTE!

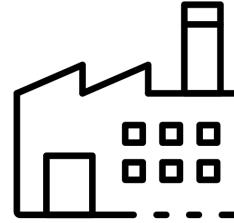


I am an



Inversion of Control (IoC)

I'll take Toyota 2JZGTE engine



Here is Toyota 2JZGTE engine



Inheritance vs Composition

class BaseCar



class BaseCarWithEngine < BaseCar



class Engine



class Car



Coupling

```
from abc import ABC, abstractmethod
```

```
class Engine(ABC):  
    @abstractmethod  
    def accelerate(self):  
        ...  
  
    @abstractmethod  
    def start(self):  
        ...  
  
    @abstractmethod  
    def stop(self):  
        ...  
  
    @property  
    @abstractmethod  
    def rpm(self):  
        ...
```

```
class FuelPump:  
    """Single responsibility."""  
    ...  
  
class Engine2JJZ6TE(Engine):  
    def __init__(self):  
        """Interface segregation, composition."""  
        self.fuel_pump = FuelPump()  
  
class Car:  
    def __init__(self):  
        self.engine = Engine2JJZ6TE()  
  
car = Car()
```


Decouple

```
class Engine2JZGTE(Engine):
    def __init__(self, fuel_pump: FuelPump):
        """Inversion of control, dependency injection."""
        self.fuel_pump = fuel_pump

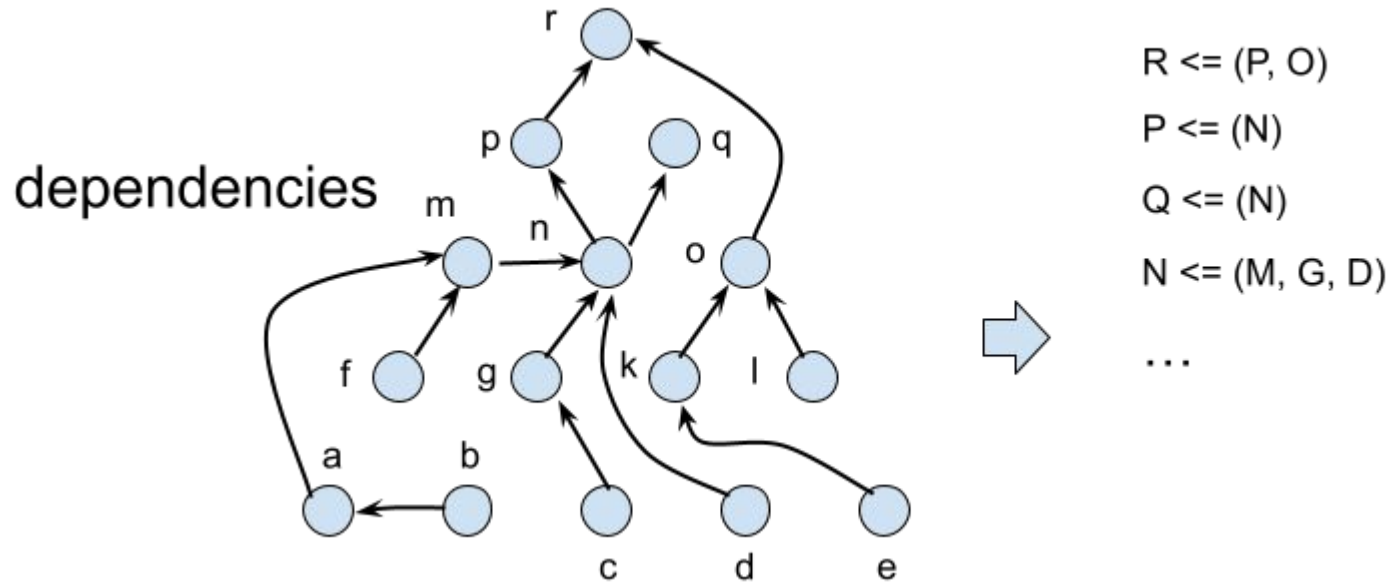
class Car:
    def __init__(self, engine: Engine):
        """Dependency inversion."""
        self.engine = engine

fuel_pump = FuelPump()
engine = Engine2JZGTE(fuel_pump=fuel_pump)
car = Car(engine=engine)
```

Benefits:

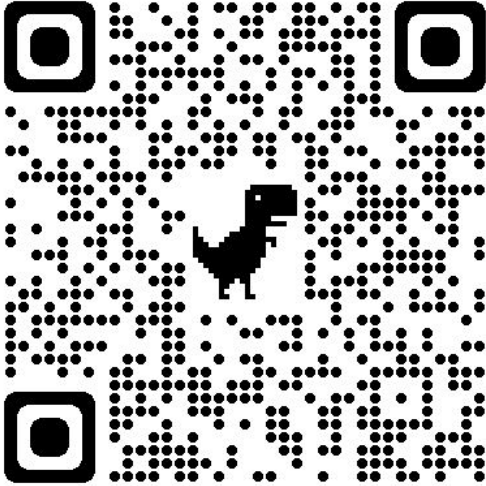
- Can clearly see all the dependencies
- Easier to change (each object and the entire app)
- Easier to test (can pass a fake object of mock as dependency, no need to patch)

Dependency Locator (Container)

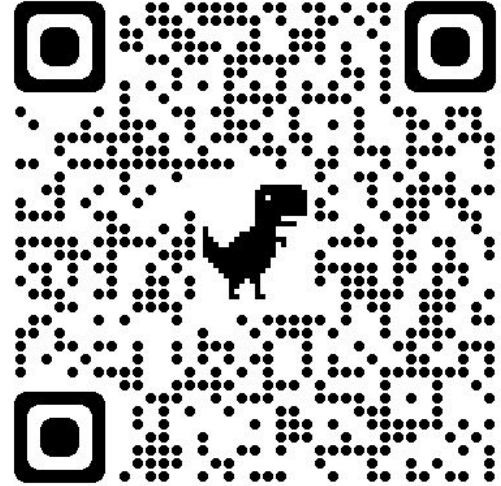


TODO List App example

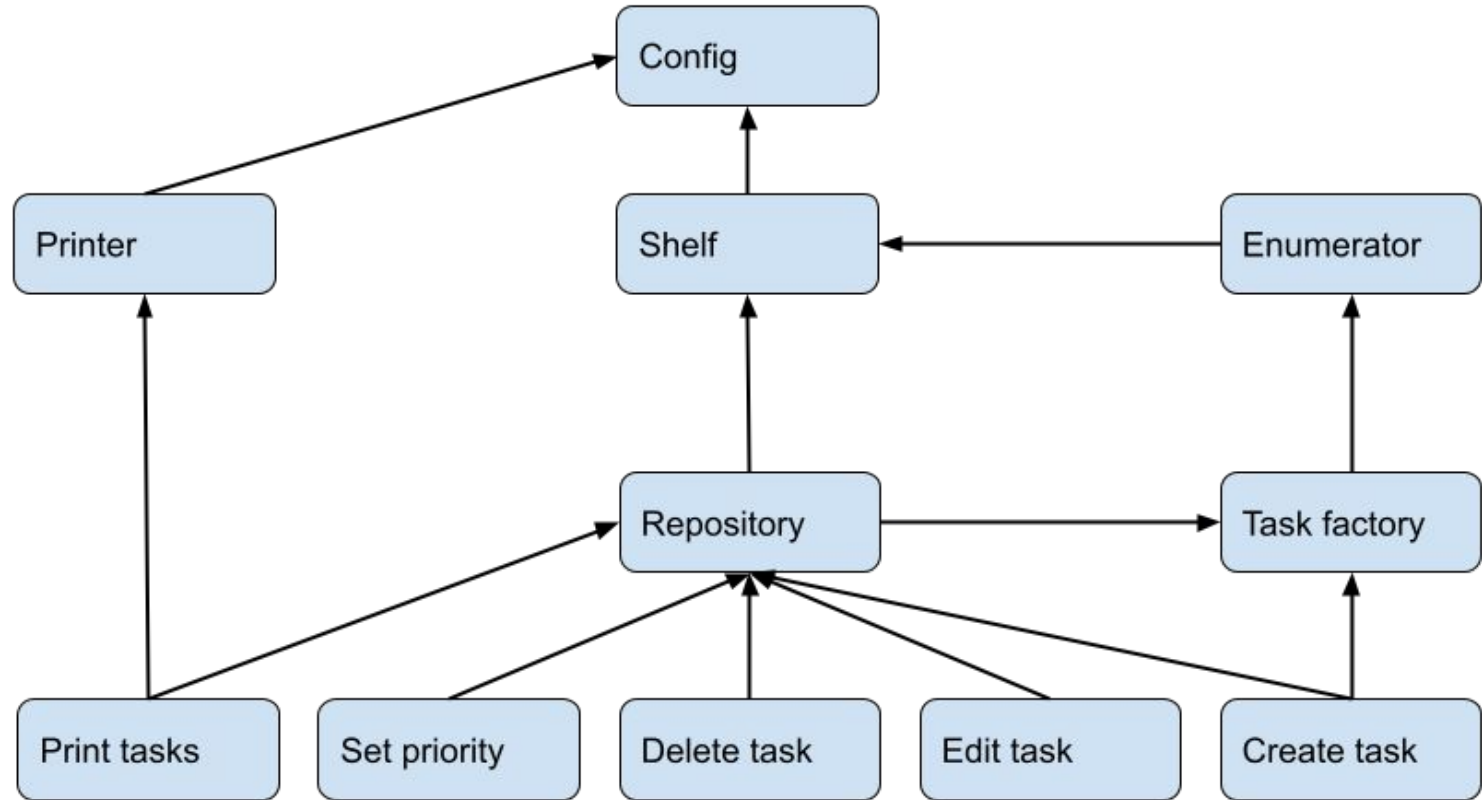
[The App on GitHub](#)



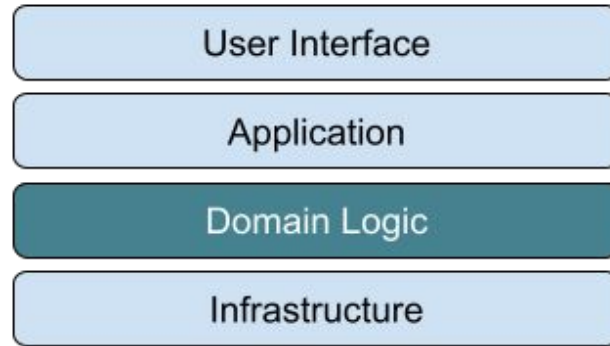
[dependency-injector](#)



TODO List App dependencies



Using Container inside a framework



[Using Container with Django example](#)

[Providers](#)