CS3342 Final Review

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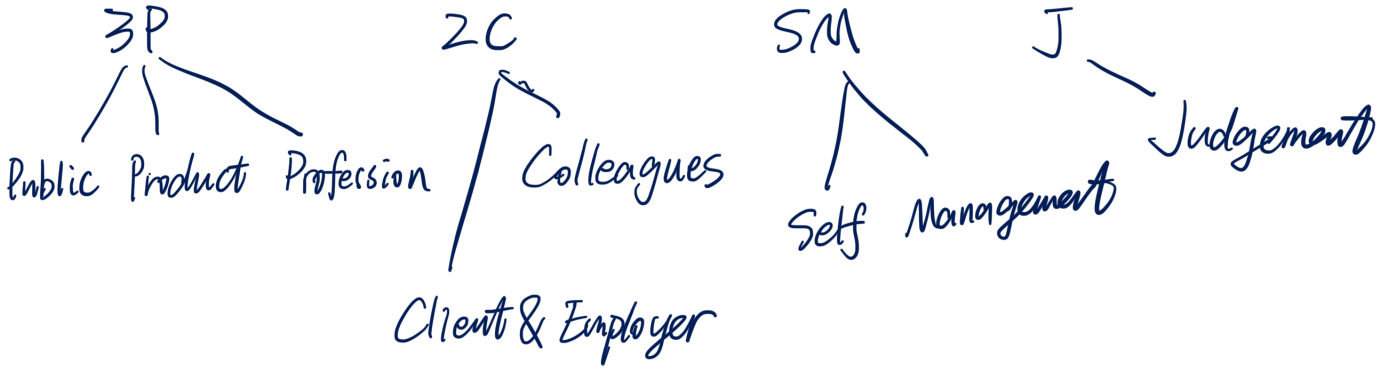
Ethics

x8 ACM Software Engineering Code of Ethics

- Public interest — 公众利益至上
- Client & Employer — 对客户和雇主忠诚，提供专业服务.
- Product — 保证产品的高品质 (开发，维护)
- Judgment — 正直&独立，不被金钱or其他利益影响
- Management — 好好管理下属，不任人唯亲
- Profession — 促进软件工程行业的良好声誉&发展
- Colleagues — 公平对待同事，乐于助同事.
- Self — 终身学习.



General

什么是 Software Engineering?

Process of 解决 customers 的问题 by systematic development & evolution of large, high-quality software systems within cost, time and other limit.

Software Process

一系列有顺序的方法，指导软件开发从开始到完成的整个过程.

The Structured set of activities needs to develop a software system.

Requirements → Design → Implementation → Verification → Maintenance

Process Model (Life cycle)

4个 Types

Linear / Incremental / Evolutionary / Other (CBSE, Agile)

Linear: Waterfall Model.

简单，易于管理. // 不现实，没有 prototype，最后发现有问题就麻烦了.

Incremental: 每完成一就分后就可以交付使用.

RAD: 基于 Incremental Model，强调缩短开发周期

系统可以模块化，多个 team 同时开发.

Evolutionary: Rapid feedback.

3个: Prototyping: 建 prototype，让用户提需求.

Spiral: 迭代开发 & 风险管理.

Concurrent Engineering: 多阶段同时进行.

CBSE: Never build what you can buy.

CASE: 计算机辅助软件工程.

Roles of Variables.

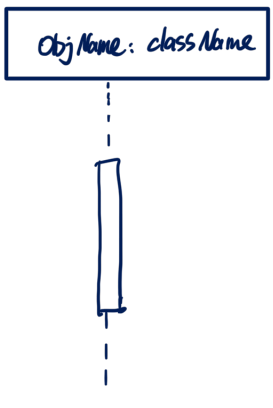
Constant, Gather, Organizer, Most-recent holder, Temporary, Stepper Transformation, One-way flag.

Sequence Diagram.

这门课: ——> 和 ——> 不作区分.

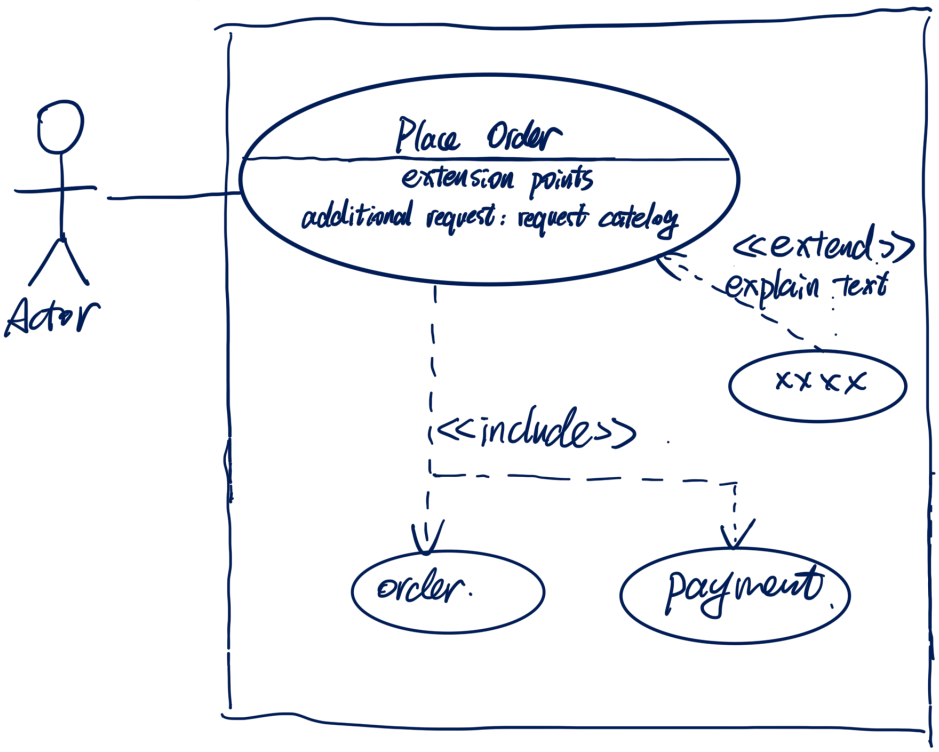
----> 返回/创造.

每个 □ 代表具体的 Object，而非 class.



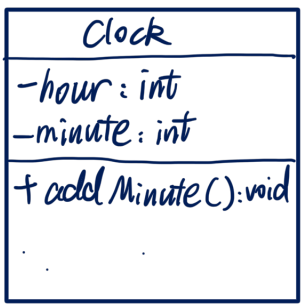
Use Case Diagram.

3个基础关系.

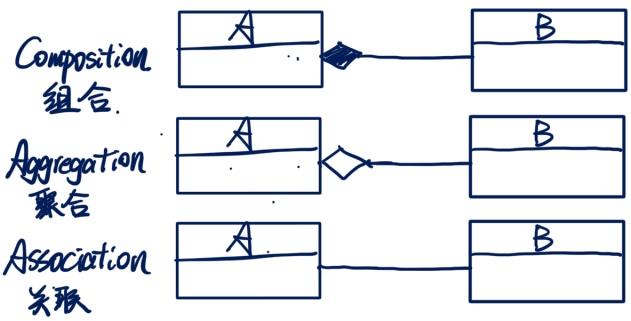


Generalization 

Class Diagram



3种关系.



A有1个B的变量(field)

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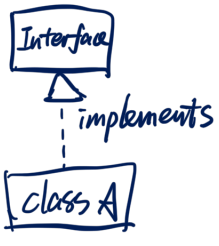
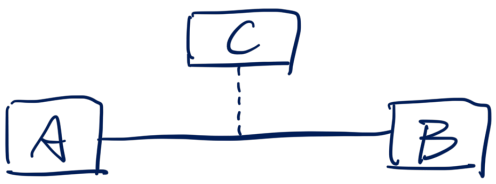
A在operation中输入输出用了B.

其他关系:

泛化/继承: 

实现(接口): 

不知道叫什么:
(表示关系的class) 

SOLID.

Single Responsibility Principle.

Open-close Principle.

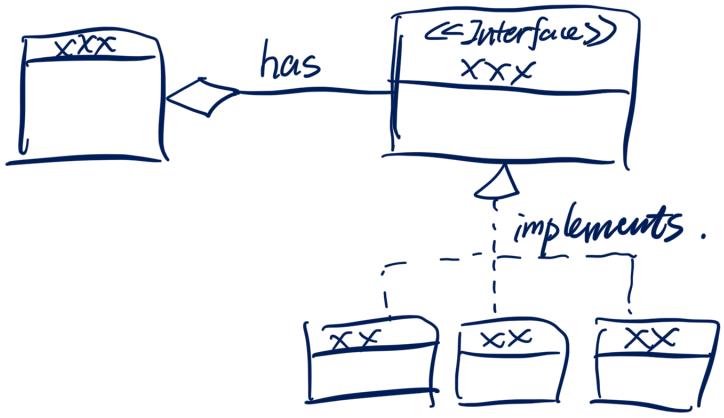
Liskov Substitution Principle.

Interface Segregation Principle

Dependency Inversion Principle

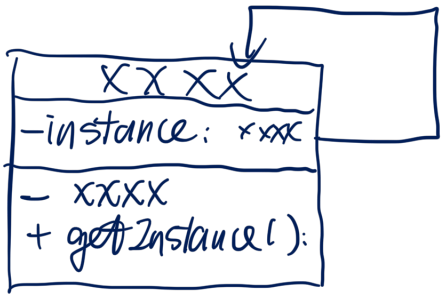
Design Pattern.

State:

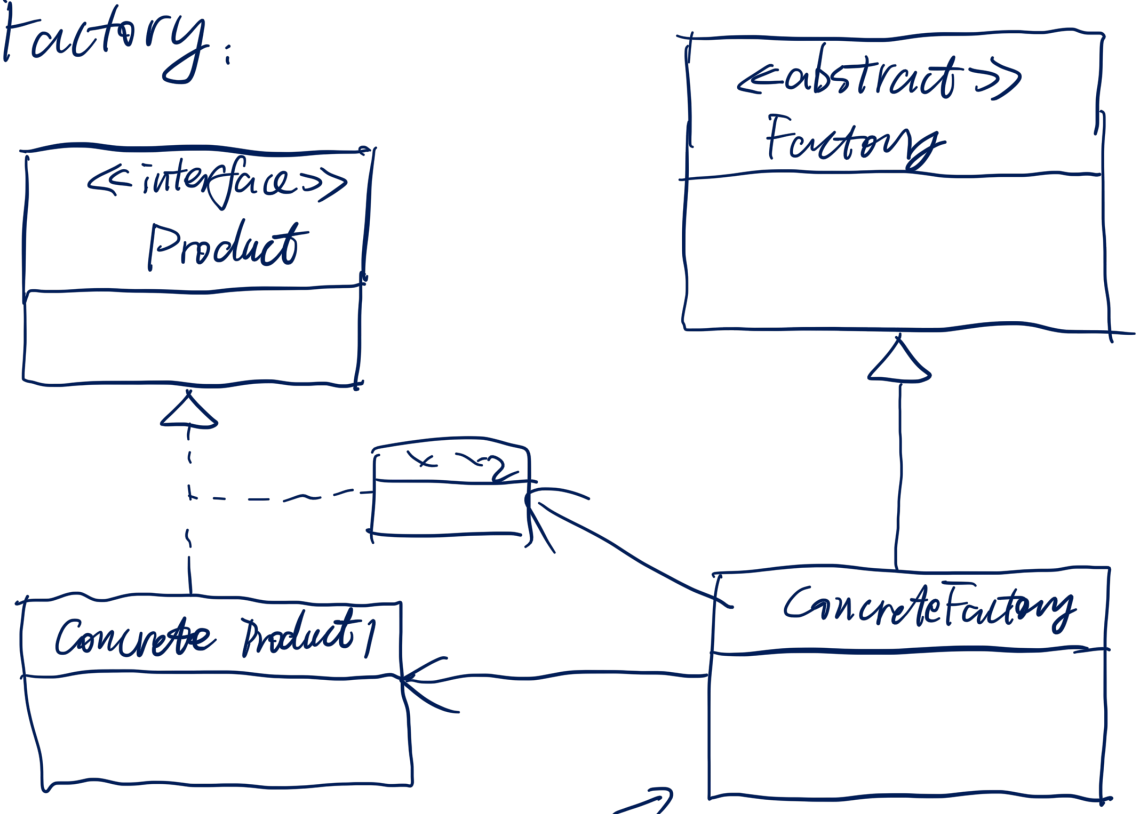


PS: Strategy Pattern:
每个state只有1个函数的state Pattern.

Singleton:



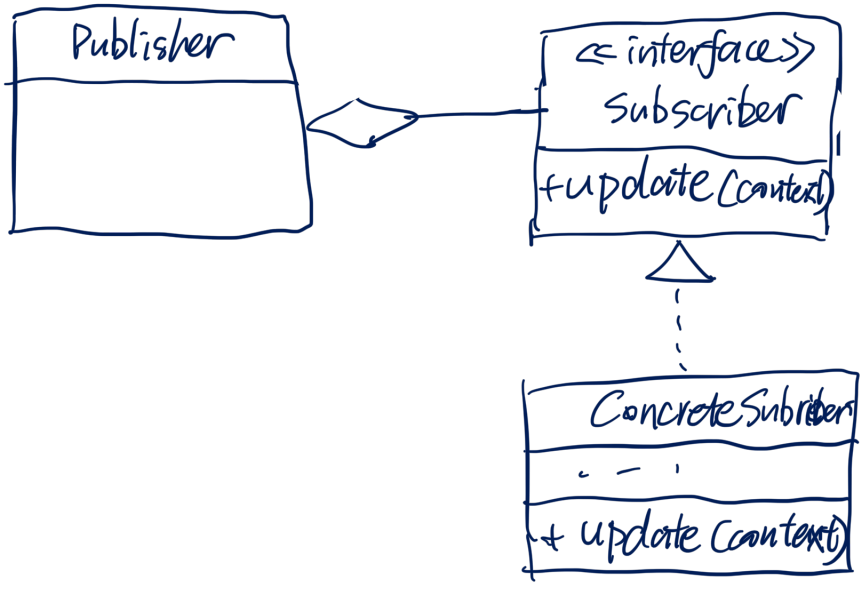
Factory:



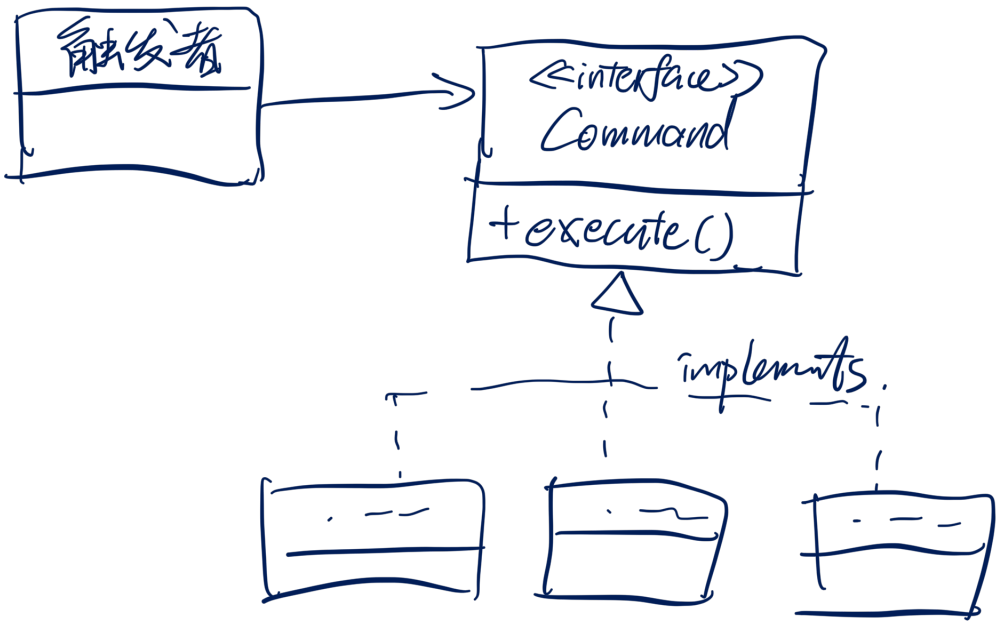
有什么用？可以在运行的时候选择创造什么类型的产品.

Facade: 一个class列出了服务项目清单，顾客点项目就行，不用关心到人具体怎么服务的.

Observer: 其实就是A向B发送信息，OP使得用户可以在运行时更改发送关系(取消定阅)



Command 将一些操作集合打包，让不同的触发者可以直接调用 Command.



也可以用 stack 实现 undo/redo
(将 Command 变成抽象 class，里面储存记录)

其实这些 Pattern 就在干一件事：Decouple (脱钩，解耦合

附：5 Ps.

Purpose, Pride, Patience, Persistence, Perspective

Functional & non-functional Requirements

Functional: What the system should perform.

逻辑，规则，计算…

Non-functional: How the system perform a certain function

响应时间，吞吐量，可恢复性，UI…