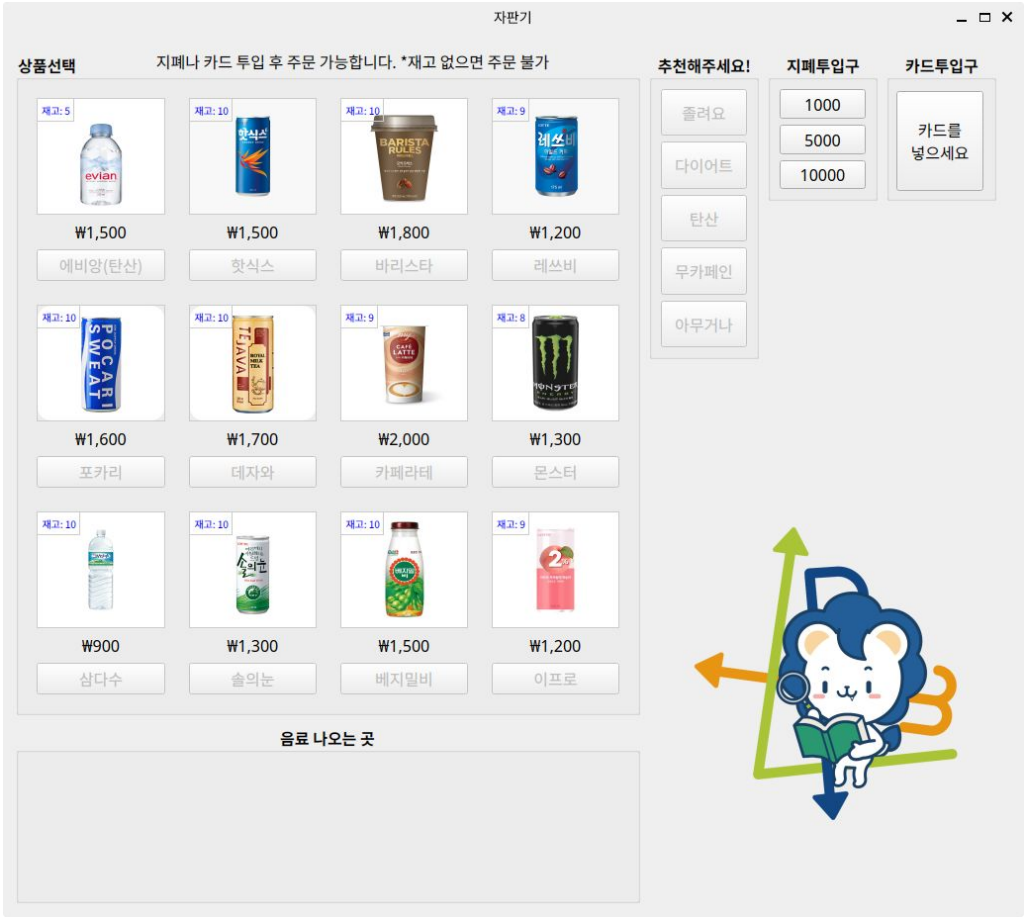
전지적 자판기 시점



싱글톤

인공지능학과 2023012533 오윤

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설계

구현

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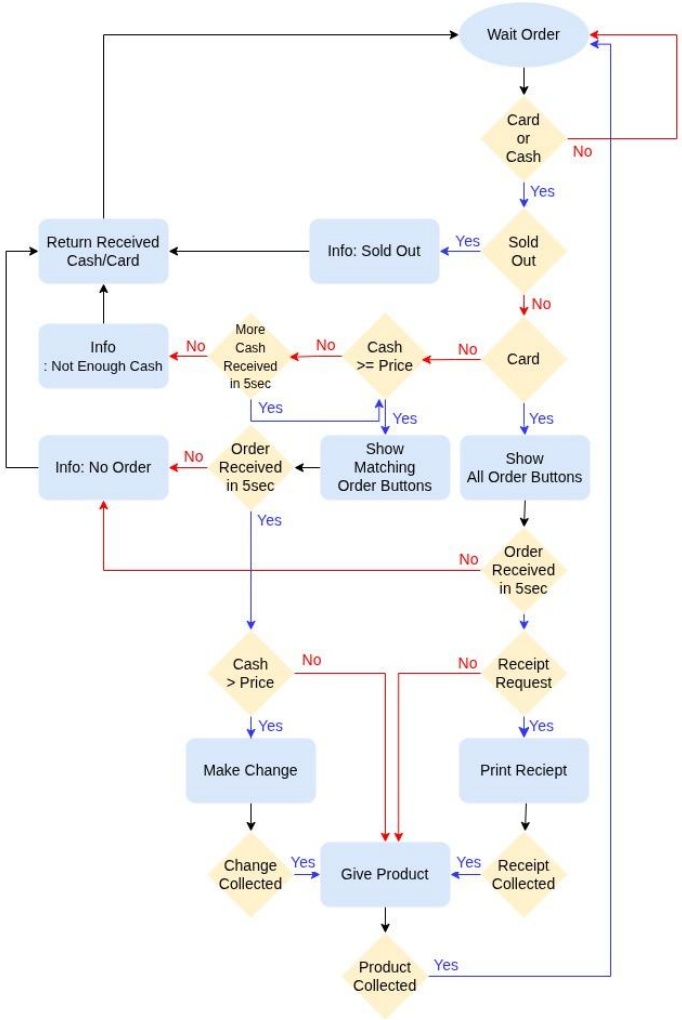
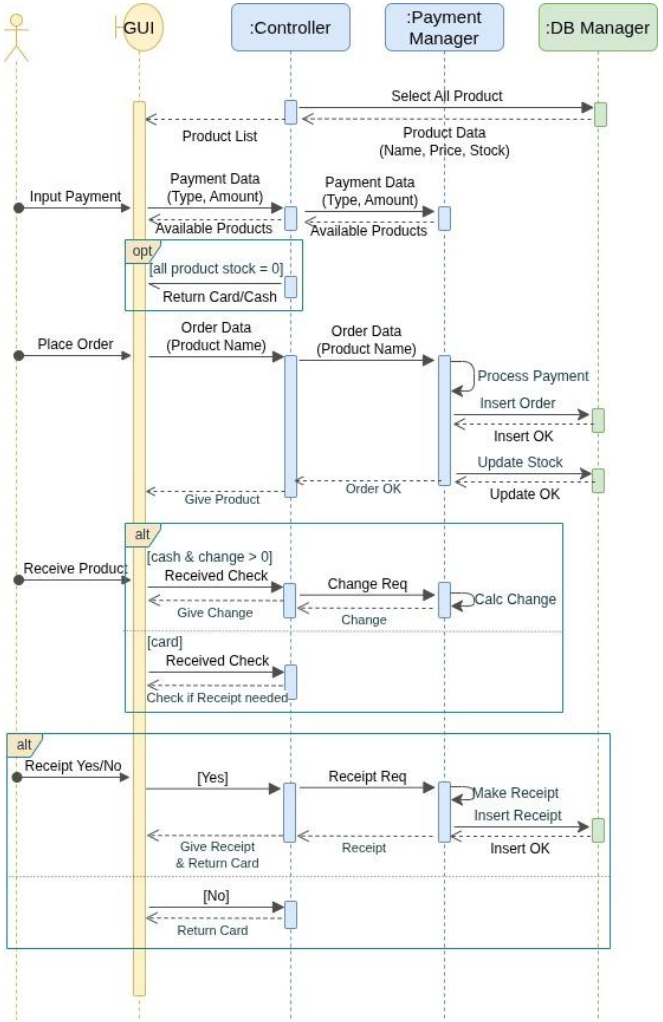
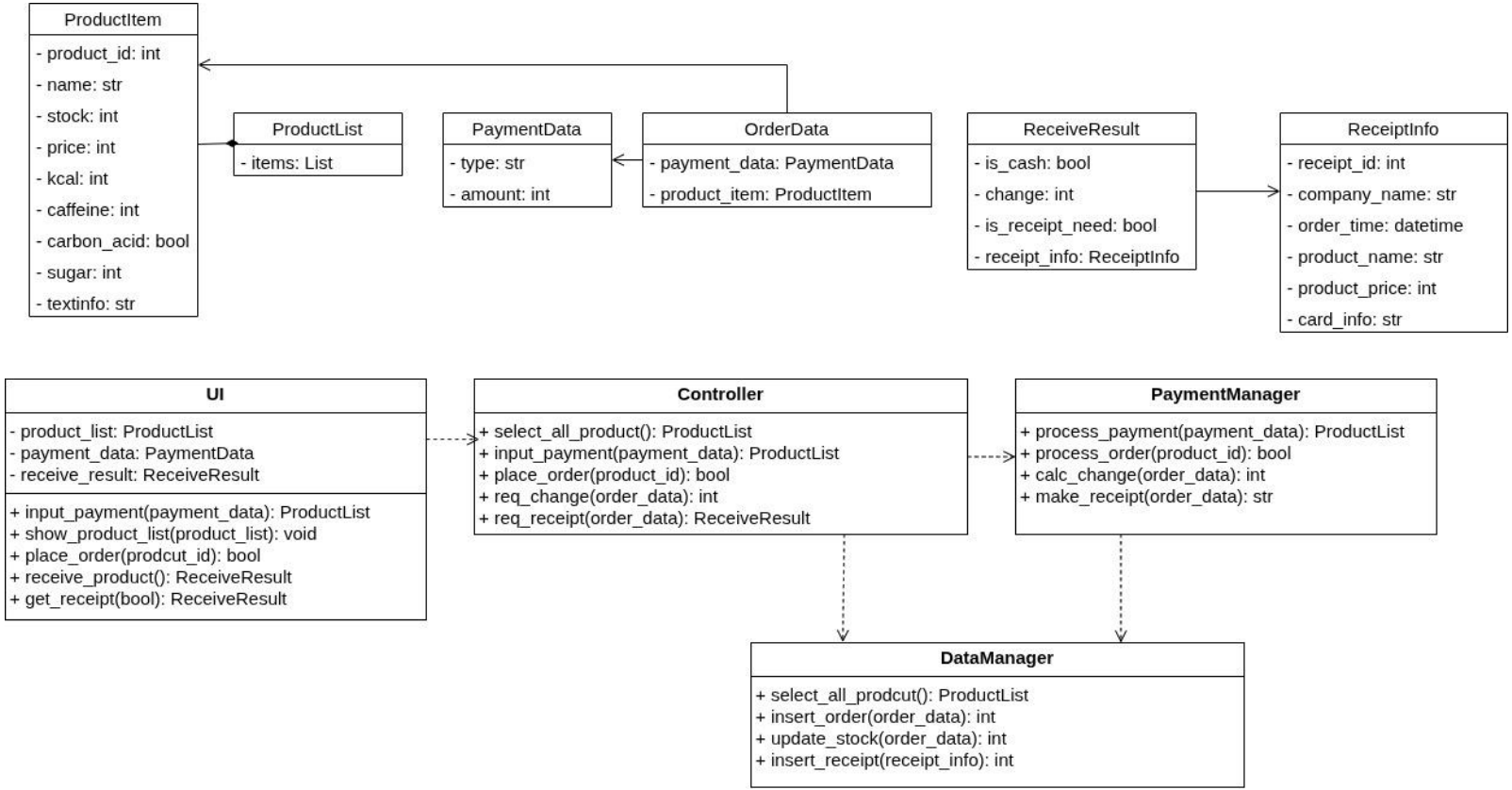
설계(1)
Flow Chart



설계(2)
구매 시나리오
(시퀀스 다이어그램)



설계(3)
구성 요소
(클래스 다이어그램)



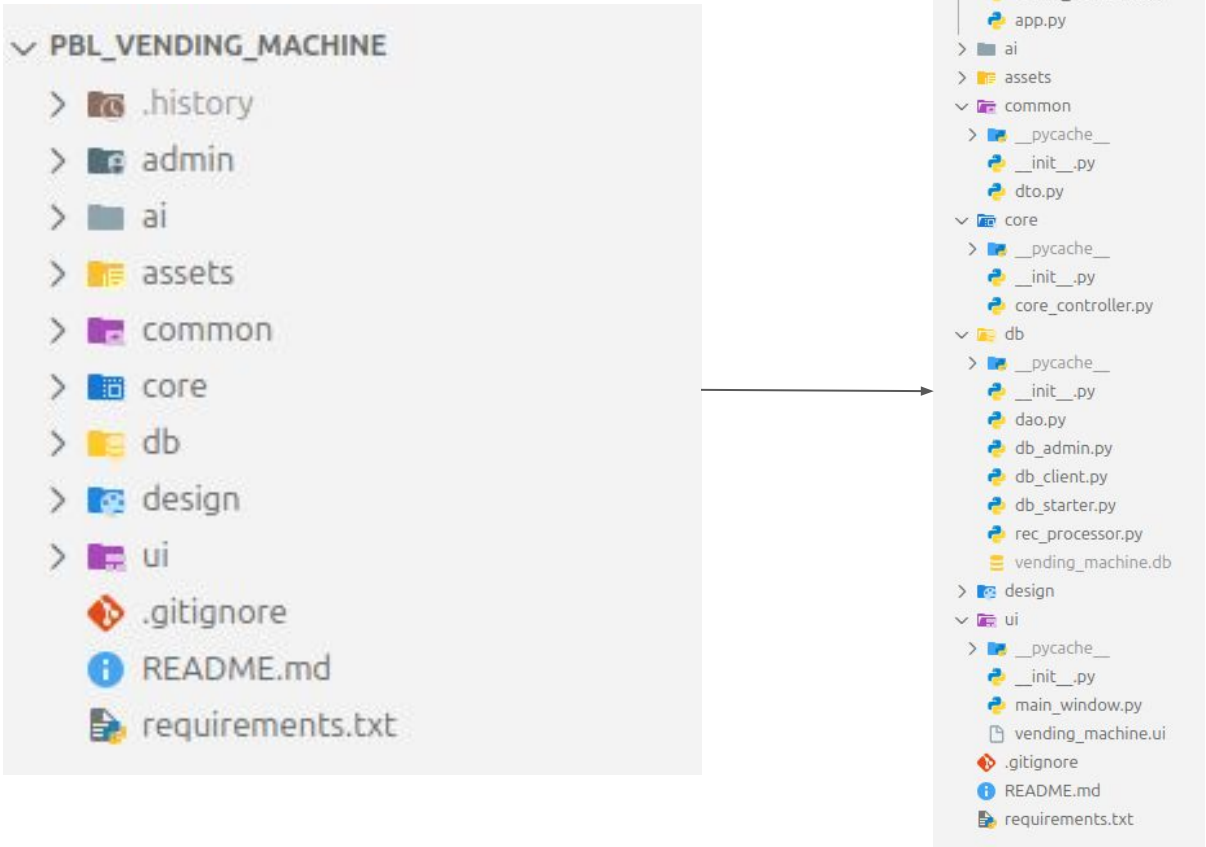
설계(4)
ERD


상품 Product
상품ID id int NOT NULL
상품명 name varchar(20) NOT NULL
재고 stock int NOT NULL
가격 price int NOT NULL
회사명 company_name varchar(20) NOT NULL
칼로리 kcal int NOT NULL
카페인 caffeine int NULL
탄산 carbon_acid boolean NOT NULL
당 sugar int NOT NULL
텍스트 text_info varchar(256) NULL
이미지경로 image_path varchar(256) NOT NULL
수정시점 edited_at timestamp NULL
주문 Order
주문ID id int NOT NULL
상품ID product_id int NOT NULL
주문시점 order_at timestamp NOT NULL
결제타입 payment_type char(4) NOT NULL
현금 cash_amount int NULL
카드 card_info varchar(50) NULL
거스름돈 cash_change int NULL
영수증 Receipt
영수증ID id int NOT NULL
주문ID order_id int NOT NULL

구현(1)
개발 환경

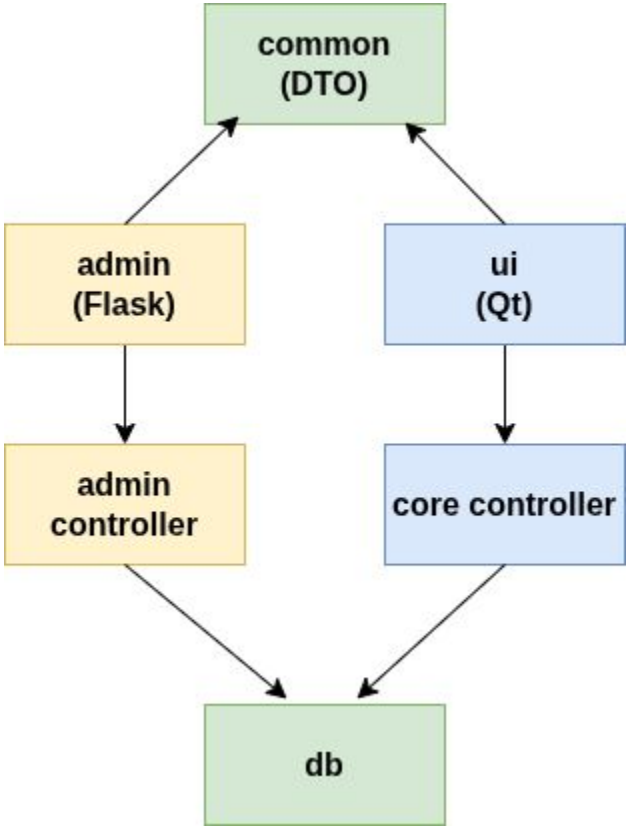
운영체제	Ubuntu 24.04 LTS
버전관리 시스템	Git, Github
개발도구	Visual Studio Code, DBeaver
개발 언어 및 프레임워크	1. Python3 - PyQt5==5.15.11 - Flask==3.1.1 - sqlalchemy==2.0.41 - opencv-python==4.11.0.86 - mediapipe==0.10.21 - scikit-learn==1.6.1 - joblib==1.5.1 2. JavaScript 3. SQL - SQLite, SQL Alchemy 4. Qt

구현(2)
프로젝트 구조

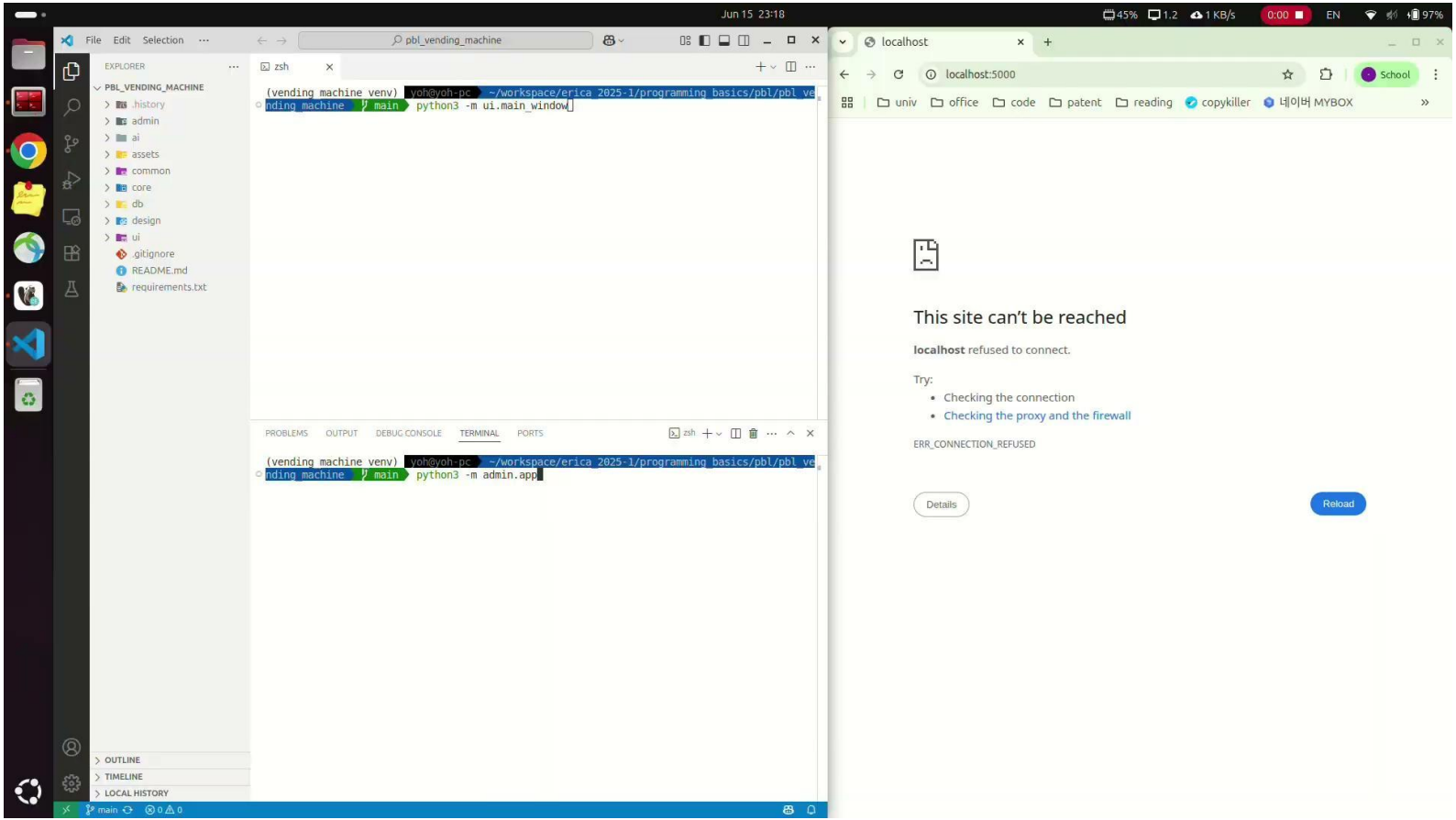

PBL_VENDING_MACHINE
.history
admin
ai
assets
common
core
db
design
ui
.gitignore
README.md
requirements.txt

PBL_VENDING_MACHINE
.history
admin
__pycache__
templates
admin_controller.py
app.py
ai
assets
common
__pycache__
__init__.py
dto.py
core
__pycache__
__init__.py
core_controller.py
db
__pycache__
__init__.py
dao.py
db_admin.py
db_client.py
db_starter.py
rec_processor.py
vending_machine.db
design
ui
__pycache__
__init__.py
main_window.py
vending_machine.ui
.gitignore
README.md
requirements.txt

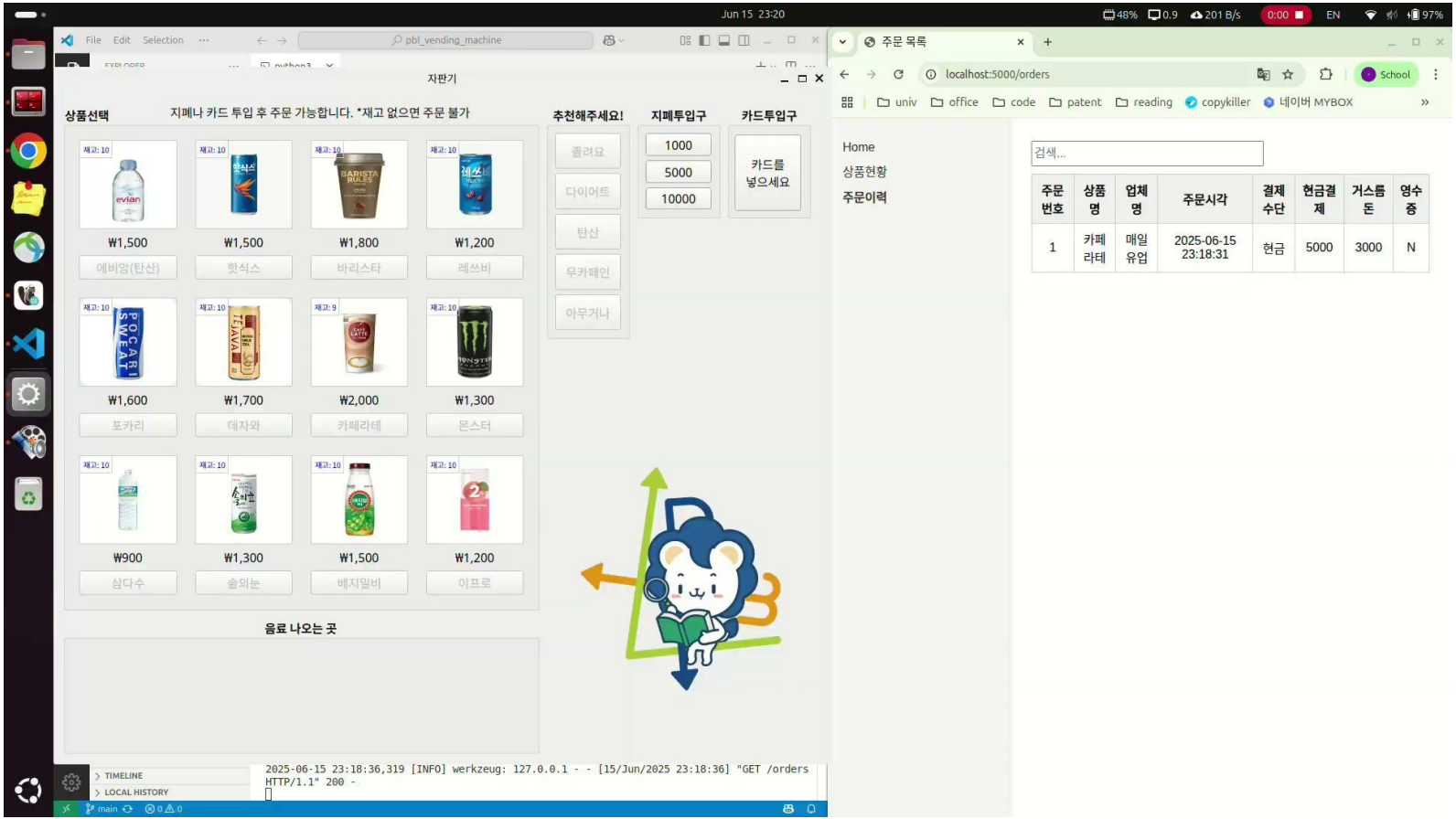
구현(3)
블록 다이어그램


common
(DTO)
admin
(Flask)
ui
(Qt)
admin
controller
core controller
db

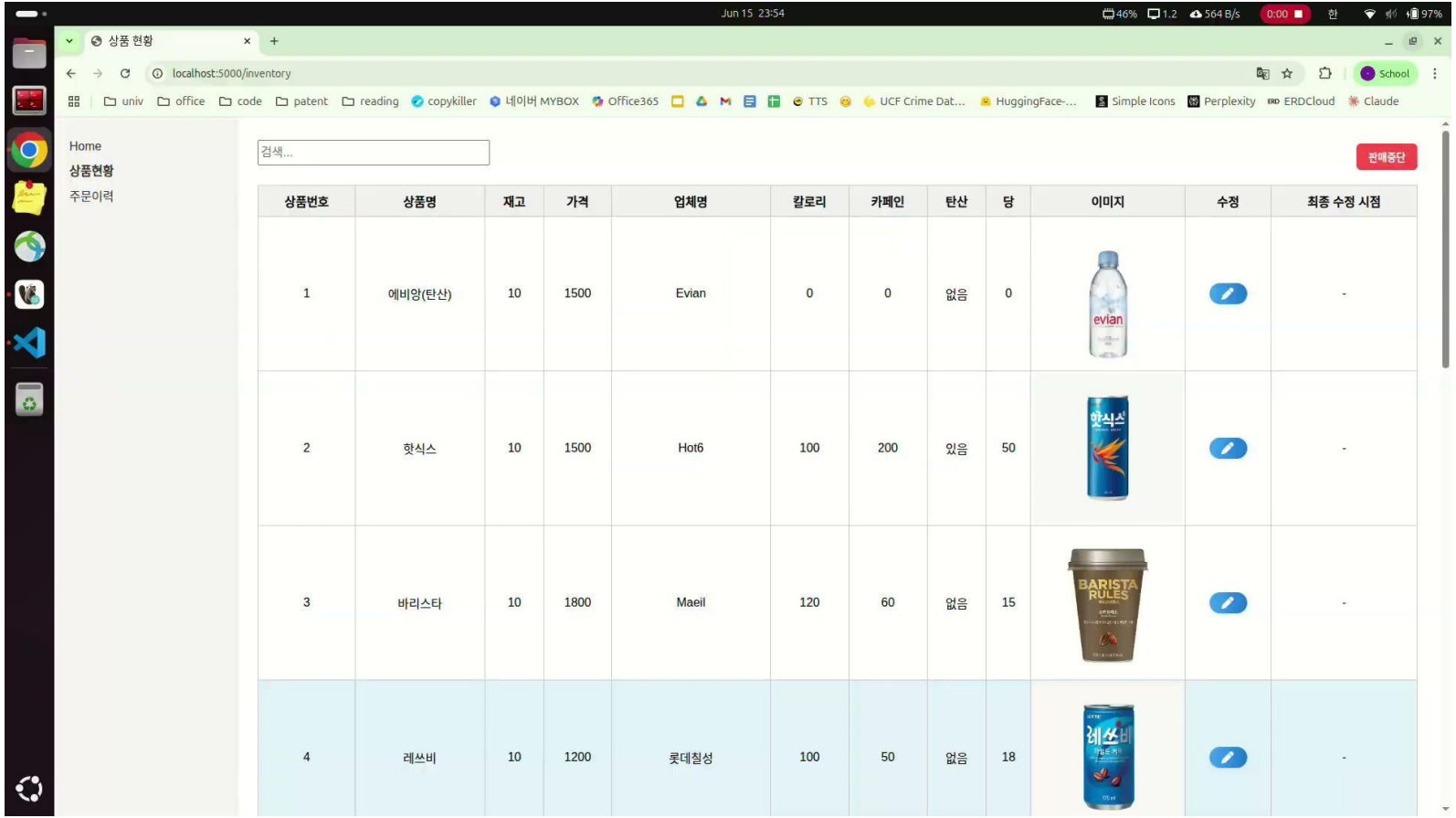
시연(1)
상품 구매: 직접 선택, 현금 결제, 거스름돈



시연(2)
상품 구매: 추천, 카드 결제, 영수증

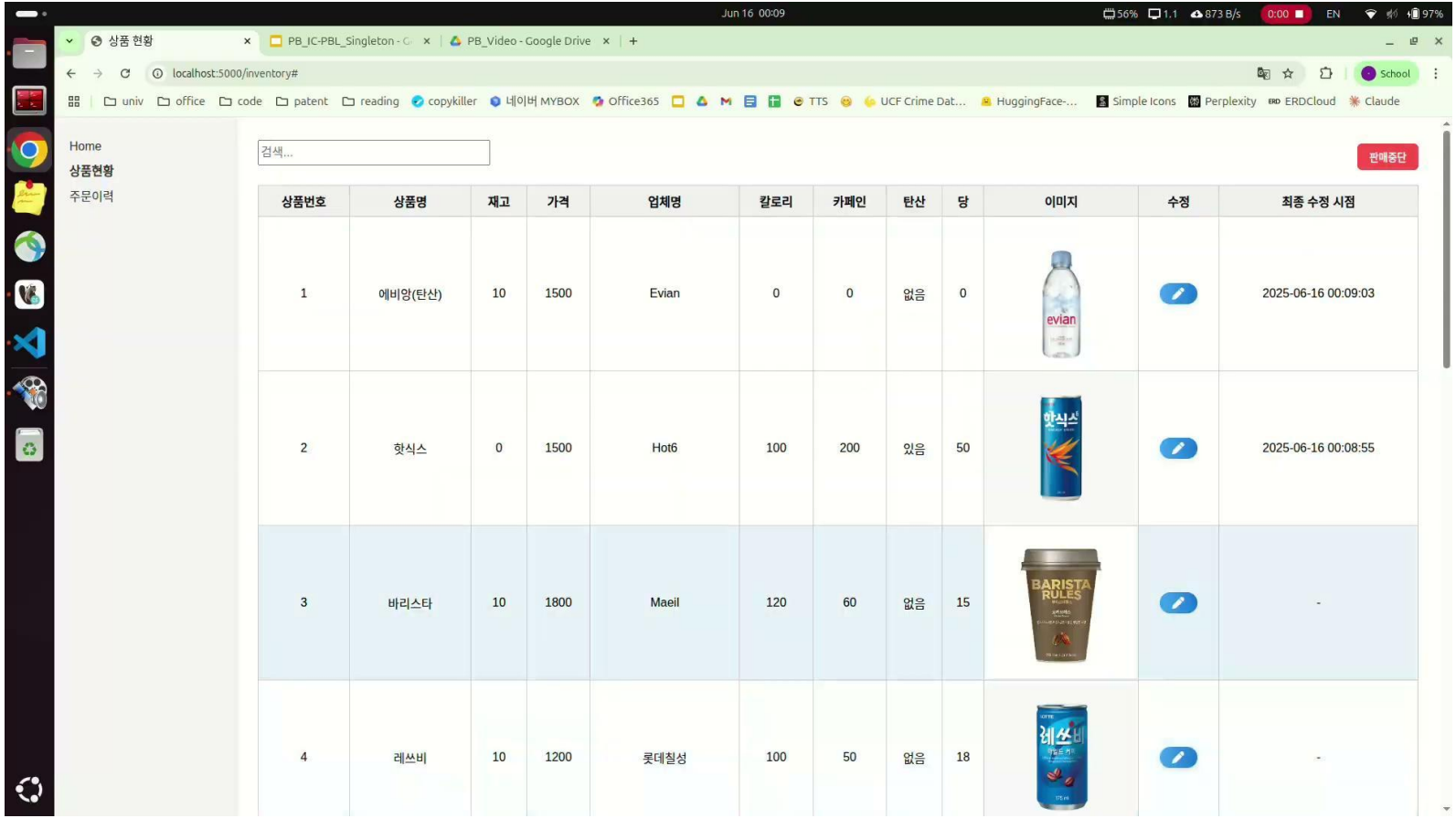


시연(3)
상품 구매: 모든 상품 재고 소진



상품번호	상품명	재고	가격	업체명	칼로리	카페인	탄산	당	이미지	수정	최종 수정 시점
1	에비앙(탄산)	10	1500	Evian	0	0	없음	0			-
2	핫식스	10	1500	Hot6	100	200	있음	50			-
3	바리스타	10	1800	Maeil	120	60	없음	15			-
4	레쓰비	10	1200	롯데칠성	100	50	없음	18			-

시연(4)
관리자 페이지: 상품 수정



고민(1)
추천 기능: 전략 패턴

db_client.py

```python
def get_rec_product(rec_type):
    with Session() as session:
        base_query = session.query(Product)
        rec_query = get_rec_query_by_type(rec_type, base_query)
        product = rec_query.first()
        return product
```

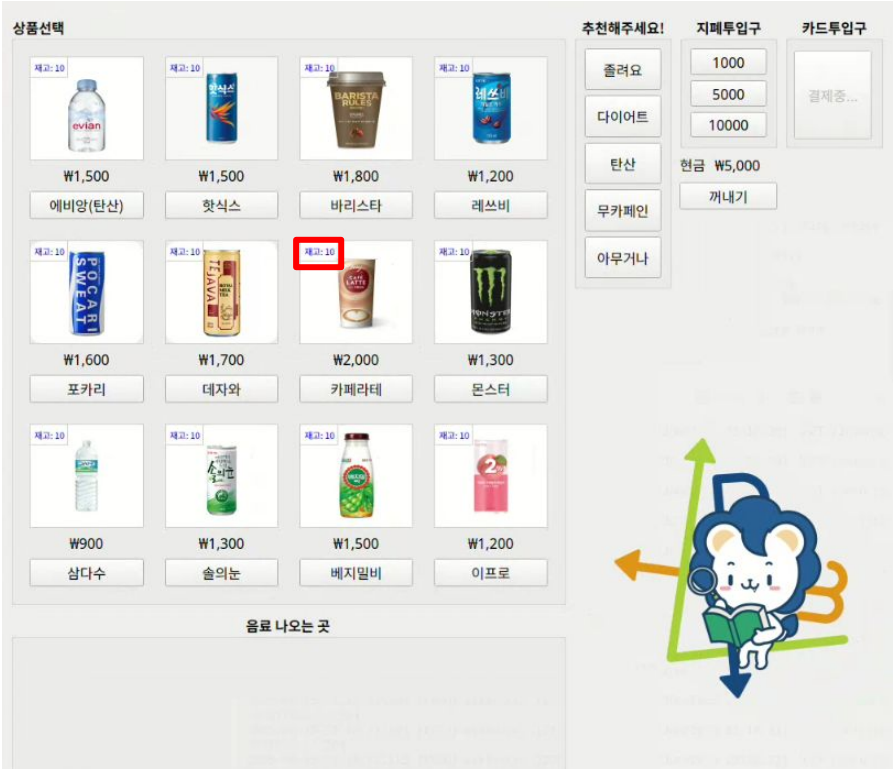
rec_processor.py

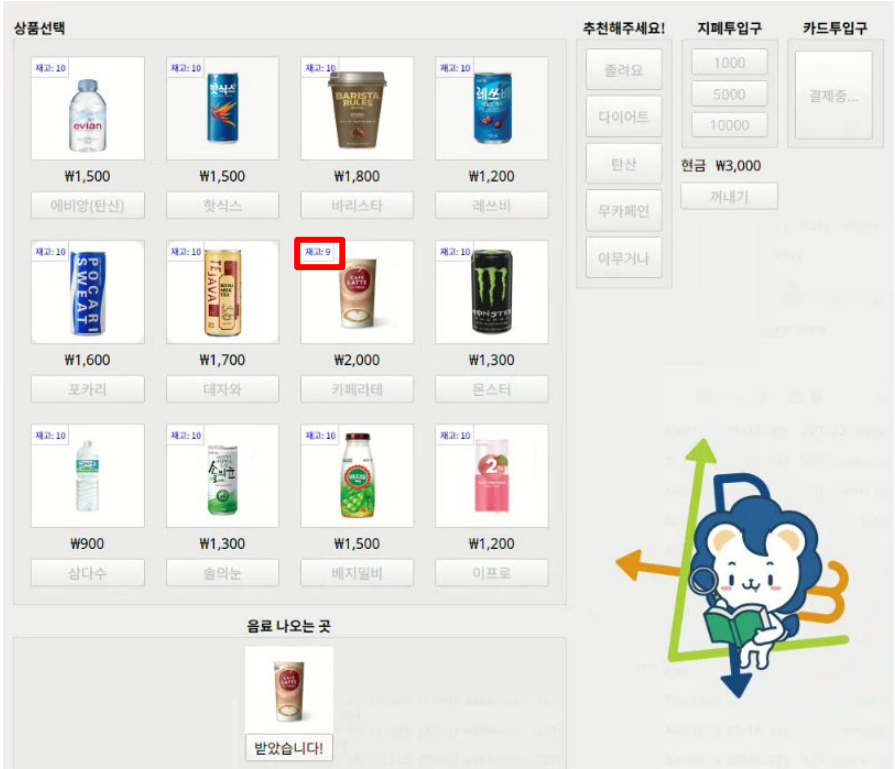
```python
RECOMMEND_STRATEGIES = {
    "caffeine": rec_caffeine,
    "kcal": rec_kcal,
    "carbon_acid": rec_carbon_acid,
    "no_caffeine": rec_no_caffeine,
    "any": rec_any,
}
```

```python
def get_rec_query_by_type(rec_type: str, query: Query):
    strategy = RECOMMEND_STRATEGIES.get(rec_type)
    if not strategy:
        raise ValueError("알 수 없는 추천 타입입니다.")
    return strategy(query)
```

고민(2)
주문 후 재고 변경 표시

```
def show_product_list(self, is_starting):
```





과욕

Q&A

감사합니다

Thank you