Name:Ma Shaoxuan

Student ID:1155251596

Work process

When customer upload a picture,the ai agenr will identify all the elements in this picture and output result in a fixed format,like:

```python
#输出格式
class receipt(BaseModel):
    commodity: dict[str,list] = Field(description="商品名称:[数里,单价,编号....]")
    summary: dict[str,float] = Field(description="除去商品本身的统计信息，例如总价，折扣，支付金额等")
    other:str = Field(description="其他信息，例如购买时间，购买地点等")
```

The result will be record and use for the next step.Users can pose a question like: How much money did I spend in total for these bills ,then the agent will answer it based on the data from the picture.

```python
# 构建问答Chain
prompt_template = ChatPromptTemplate.from_template(
    """你是一个智能助手，请根据以下购物小票的结构化数据回答用户的问题。

    小票数据:
    {receipt_data}

    用户问题: {question}
    """
)

试  Ctrl U  与 AI 聊天，Ctrl I  与 AI 一起编写代码。
chain = prompt_template | llm | StrOutputParser()

# 模拟用户提问
user_question = "How much money did I spend in total for these bills?"
print(f"\n用户提问: {user_question}")

answer = chain.invoke({"receipt_data": str(result), "question": user_question})
print(f"AI回答: {answer}")
```

Results:

Query 1: How much money did I spend in total for these bills?

Picture:



Data from the receipt:

```
meworks/nwi/Aitest.py
<class '__main__.receipt'> commodity={'韭菜豬肉雲吞20粒裝': [3, 24.9, '084213', 74.7], '包裝變形 (折扣)': [3, -12.4, '084213'
, -37.2], 'IF100% COCONUT WATER': [2, 28.9, '395092', 57.8], 'Buy 2 Save $12.8 (折扣)': [1, -12.8, None, -12.8], '玉芒': [3,
9.9, '044228', 29.7], 'Buy 3 Save $10.8 (折扣)': [1, -10.8, None, -10.8], 'Fresh综合莓汁': [2, 17.9, '490948', 35.8], 'Buy 2
Save $3.9 (折扣)': [1, -3.9, None, -3.9], '雀巢脫脂高鈣牛奶飲品': [1, 21.9, '126894', 21.9], '蔬菜先生包裝蕃茄(中': [1, 9.9,
'055421', 9.9], '蔬菜先生翠玉瓜1磅': [1, 7.9, '047827', 7.9], '咸蛋蒸肉餅': [1, 36.9, '089288', 36.9], '金御膳龍口粉絲': [2,
11.9, '118700', 23.8], '(業務用)急凍蠄子肉': [2, 65.0, '013723', 130.0], '白柳姬菇': [1, 14.9, '047610', 14.9], '蒜汁雞扒': [
1, 36.9, '089376', 36.9], '5% OFF (CU) (折扣)': [1, -20.78, None, -20.78]} summary={'subtotal': 394.72, 'rounding': -0.02, 't
otal_paid_octopus': 394.7, 'change': 0.0, 'deduction_amount': -15.9} other='机号: 515214, 八达通卡号码: 172731824, 上一次于20
25-04-10 网上增值, 收银员姓名: JL, 收银员: 1234'
```

Answer:

用户提问: How much money did I spend in total for these bills?
AI回答: You spent 394.7 HKD in total for these bills.

Query 2: How much would I have had to pay without the discount?

Data from the receipt:

```
meworks/hw1/A1test.py
<class '__main__.receipt'> commodity={'韭菜豬肉雲吞20粒裝': [3, 24.9, '084213', 74.7], '包裝變形 (折扣)': [3, -12.4, '084213'
, -37.2], 'IF100% COCONUT WATER': [2, 28.9, '395092', 57.8], 'Buy 2 Save $12.8 (折扣)': [1, -12.8, None, -12.8], '玉芒': [3,
9.9, '044228', 29.7], 'Buy 3 Save $10.8 (折扣)': [1, -10.8, None, -10.8], 'Fresh綜合莓汁': [2, 17.9, '490948', 35.8], 'Buy 2
Save $3.9 (折扣)': [1, -3.9, None, -3.9], '雀巢脫脂高鈣牛奶飲品': [1, 21.9, '126894', 21.9], '蔬菜先生包裝蕃茄(中': [1, 9.9,
'055421', 9.9], '蔬菜先生翠玉瓜1磅': [1, 7.9, '047827', 7.9], '咸蛋蒸肉餅': [1, 36.9, '089288', 36.9], '金御膳龍口粉絲': [2,
11.9, '118700', 23.8], '(業務用)急凍蜆子肉': [2, 65.0, '013723', 130.0], '白柳姬菇': [1, 14.9, '047610', 14.9], '蒜汁雞扒': [
1, 36.9, '089376', 36.9], '5% OFF (CU) (折扣)': [1, -20.78, None, -20.78]} summary={'subtotal': 394.72, 'rounding': -0.02, 't
otal_paid_octopus': 394.7, 'change': 0.0, 'deduction_amount': -15.9} other='机号: 515214, 八达通卡号码: 172731824, 上一次于20
25-04-10 网上增值, 收银员姓名: JL, 收银员: 1234'
```

Answer:

```
用户提问: How much would I have had to pay without the discount?
AI回答: Without any discounts, you would have had to pay **$480.20**.
```

Ask for the calculation process:

```
# 模拟用户提问
user_question = "How much would I have had to pay without the discount?Show the calculation process"
print(f"\n用户提问: {user_question}")
```

```
**计算过程:**

1.  **找出所有折扣项目及其金额: **
    *   `包裝變形 discount`: 3 件 * 12.4 = 37.2
    *   `Buy 2 Save $12.8 discount`: 1 件 * 12.8 = 12.8
    *   `Buy 3 Save $10.8 discount`: 1 件 * 10.8 = 10.8
    *   `Buy 2 Save $3.9 discount`: 1 件 * 3.9 = 3.9
    *   `5% OFF (CU)`: 1 件 * 20.78 = 20.78

2.  **计算所有折扣的总金额: **
    37.2 + 12.8 + 10.8 + 3.9 + 20.78 = **85.48**

3.  **将总折扣金额加回到小计 (subtotal) 中: **
    小计 (subtotal) = 394.72
    没有折扣的总金额 = 小计 + 总折扣金额
    没有折扣的总金额 = 394.72 + 85.48 = **480.20**

**结论:**
```