C++ Programming

Polymorphism Homework 1

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Teaching, Training and Coaching since more than a decade!

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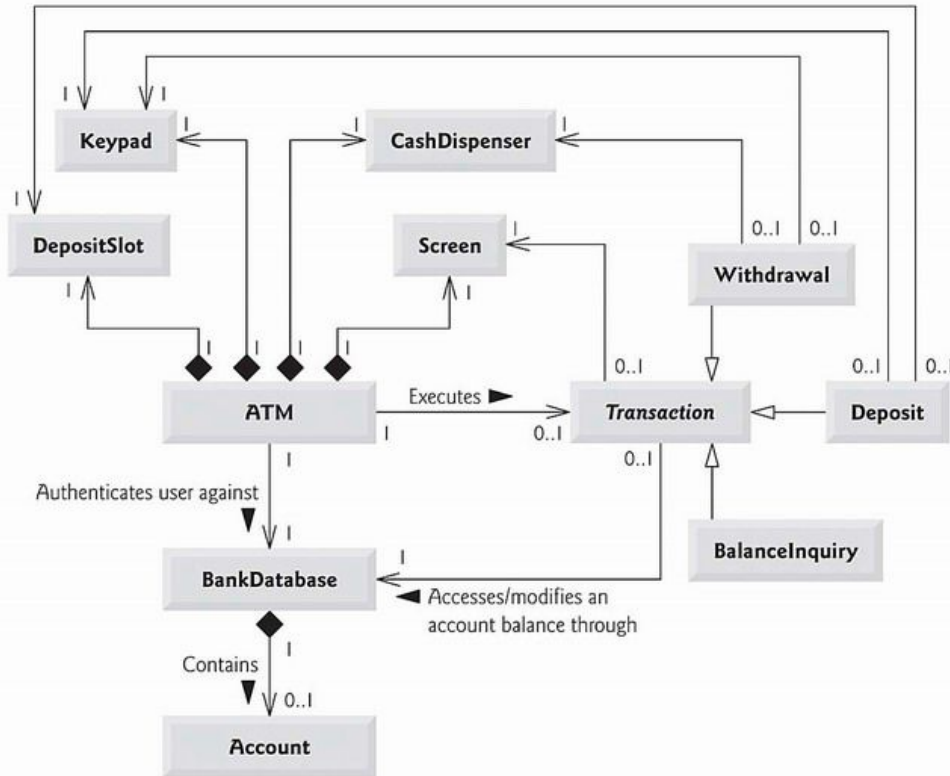*Bachelor / Msc* from Cairo University - Egypt
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Homework Targets

- During solving the homework you should always consider
  - Remove Dependencies
    - Whenever class A depends on B, this is coupling
  - Polymorphism
    - When you have something that can have many forms, depend on some parent class.
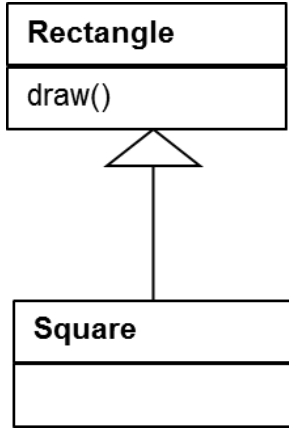
Homework 1: Explain ATM-Machine UML

Img

- Like most of ATM Machine
  - You can check your balance
  - Withdraw or deposit money
    - E.g. from seperate parts

Homework 2: Square

```
┌─────────────┐
│ Rectangle   │
├─────────────┤
│ draw()      │
└─────────────┘
       △
       │
┌─────────────┐
│ Square      │
├─────────────┤
│             │
└─────────────┘
```

- A fresh engineer design the following diagram for some shapes relations
    - Why do you think he thought this way?
    - Figure Out a reason why it is incorrect? Provide a tip
    - How to fix the design.
        - Assume rectangle class is a heavy class (several functionalities and code).

Homework 3: Company Payroll

- We need to represent a company and its payroll:
  - Working people: either volunteers or employees
  - Employees could be hourly based or salaried based.
    - Also a commision salaried employee takes extra money as ratio of the sales he did
  - Also there are invoices, each invoice has set of items (books, Food, etc)
    - Each item has its own details (e.g. book author name)
  - The payroll should determine and pay money for whatever payable such as employee or invoice
- Assume after a few months later we needed:
  - A Labourer Employee which is a Hourly Employee
  - No new functions and variables at the moment
  - Should you add a new class for Labourer or just use the HourlyEmployee as an object?
- Develop the classes

Homework 4: Study JSON Library

- JSON is a standard text-based format for representing structured data
- You will study and use this library
  - Attached to the lecture: the library cpp file + a modified example by me
    - Run, Read the code, Guess the text structure
  - Then Educate yourself about JSON. Google more if needed
  - Then check out their library interface
  - Note: In future assignments/projects, you will use JSON
- Other popular market formats to learn: XML, YAML

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."