

## Template Method

- Intent

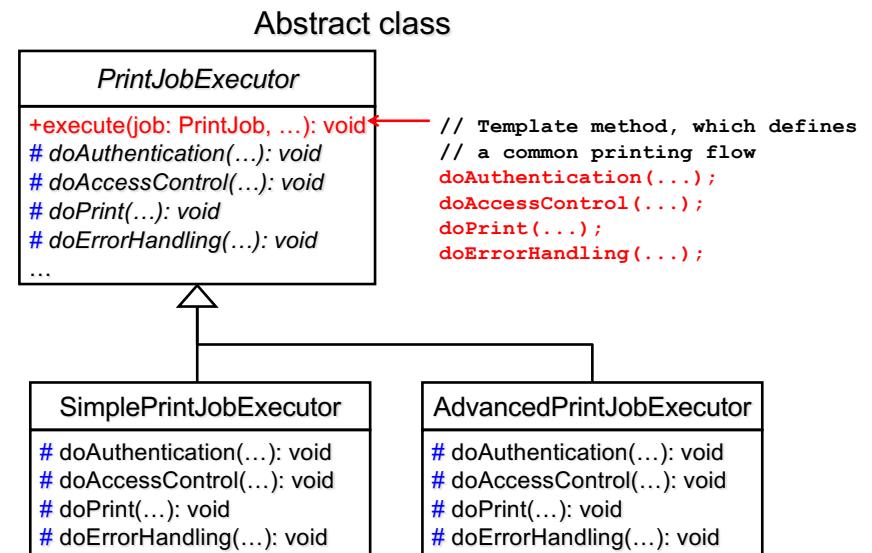
- Define the template (or abstract flow) of an algorithm in a superclass's method
  - Defer the implementation details of some steps in the algorithm to subclasses.
  - Have subclasses override (or redefine) those steps without changing the algorithm's template/flow.
- Can reuse (or enforce) the template in all subclasses.

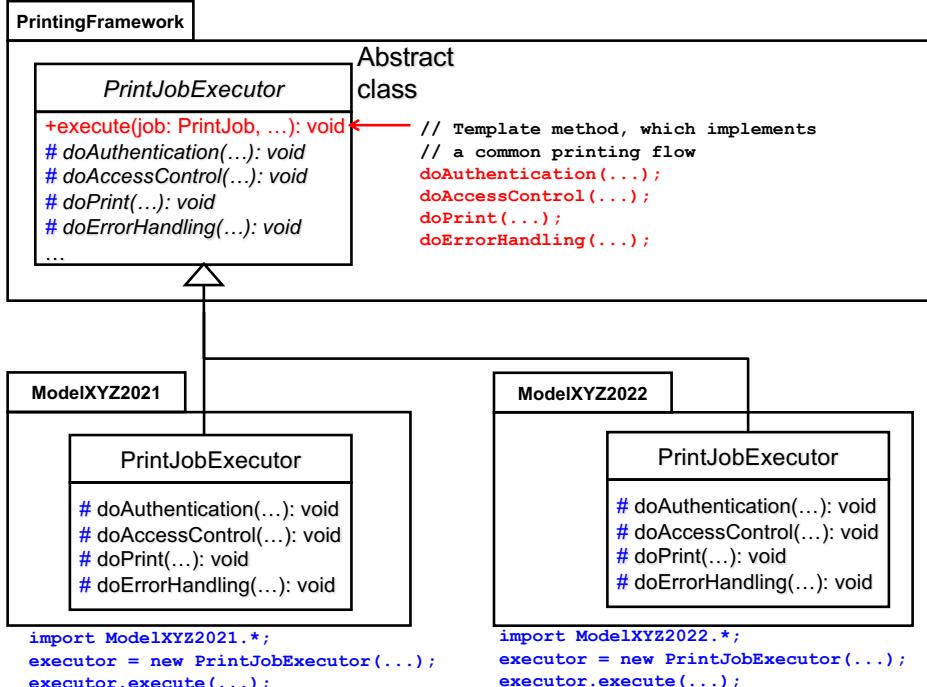
## Template Method Design Pattern

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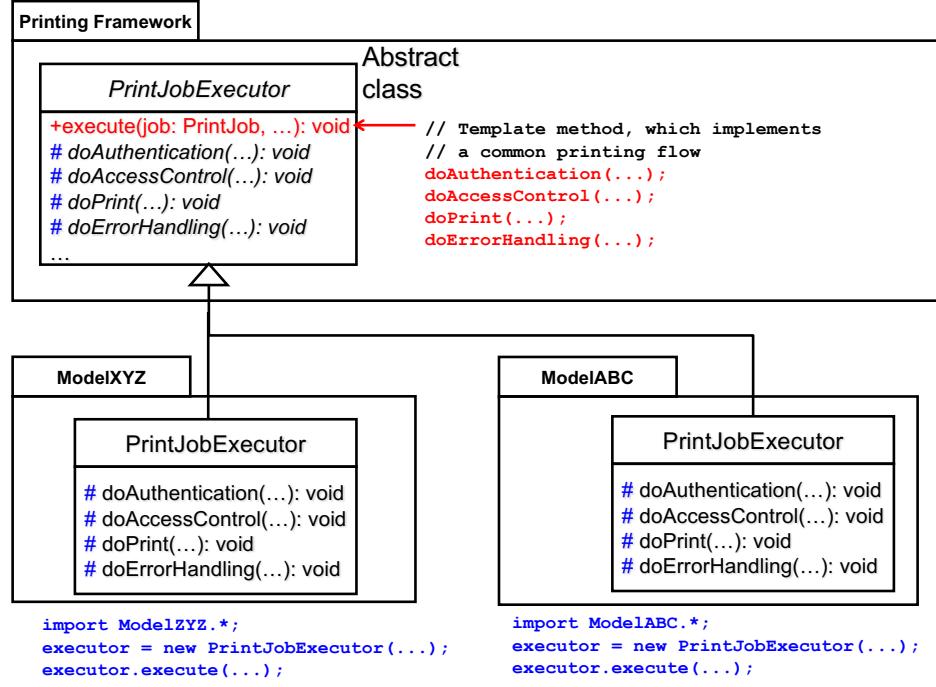
## Template for Printing Procedure

- Suppose you are implementing printer firmware
  - Common printing flow
    - Authentication
      - Enforce who can access the printer and who cannot.
    - Access control
      - Enforce who can use which services.
    - Print
    - Error handling
      - Manage what to do upon errors
  - Can define this common flow in a superclass and reuse the flow across its subclasses, which implement different firmware.
    - Different versions for the same printer model.
    - Different firmware for different printer models.





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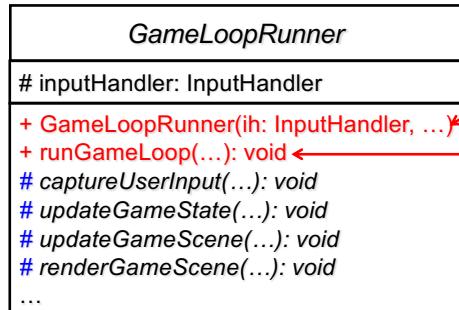
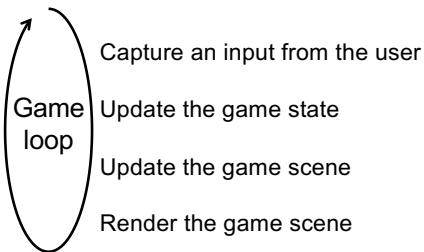
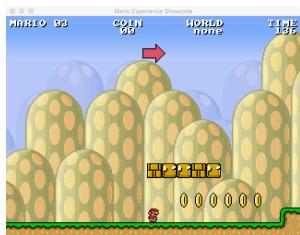
## Benefits

- Can explicitly define the flow of an algorithm.
  - Can separate individual steps in the flow clearly.
- Can consistently use/enforce the same flow across different subclasses
- Different subclasses can customize algorithm steps as necessary.

## Important Notice

- You must work on your coding **alone (by yourself)**.
  - You can discuss HW assignments with other students. However, you must do your coding **yourself**.
- It is an **academic crime** to
  - Copy (or steal) someone else's code and submit it as your own work.
  - Allow someone else to copy (or steal) your code and submit it as his/her work.
    - Use a **private repo** to avoid this.
- You will end up with a **serious situation** if you commit this academic crime.
  - The University, College, Department and I have **no mercy** about it.

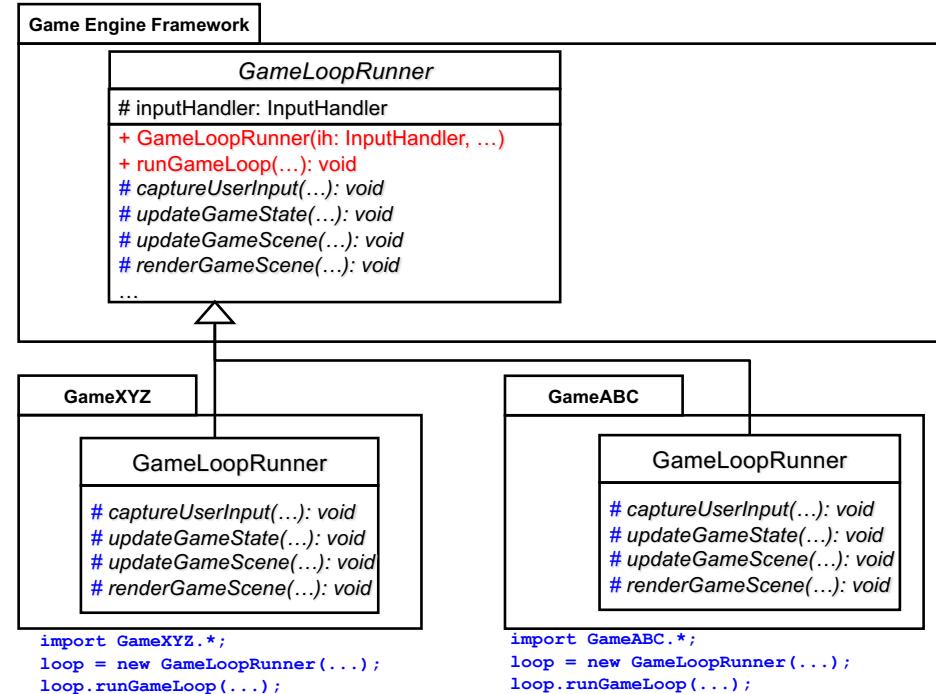
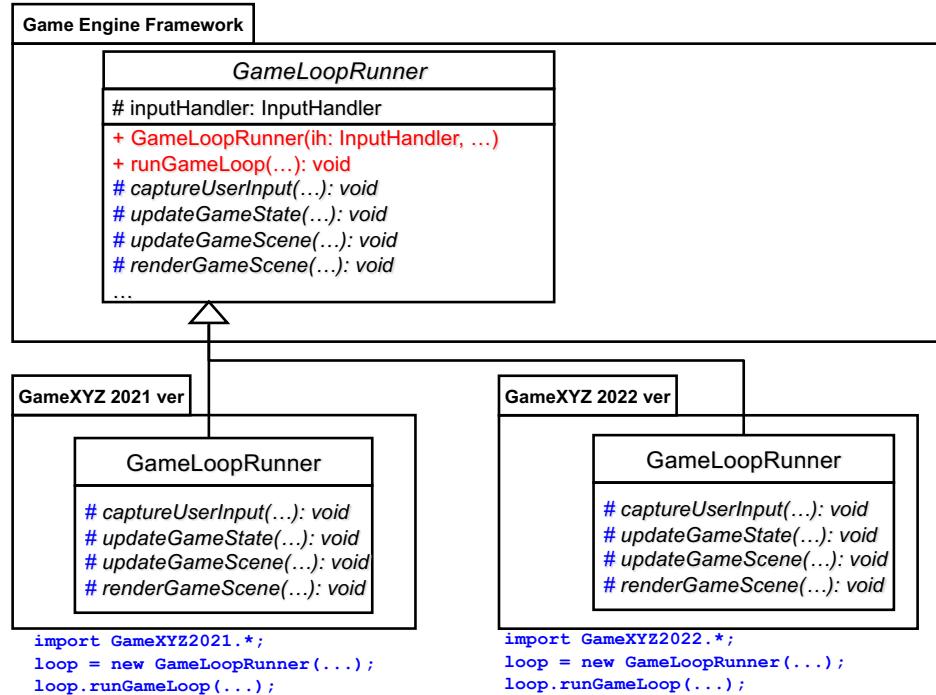
# Game Loop as a Template



```

this.inputHandler = ih;
...
// Template method, which implements
// the common game loop flow
while true {
    captureUserInput(...);
    updateGameState(...);
    updateGameScene(...);
    renderGameScene(...); }
```

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## Other Template Examples

- Loan initiation (loan setup)
  - Credit score analysis
  - Transaction history analysis
  - Household analysis
  - etc. etc.
- Keyword search
  - Keyword analysis
  - Search
  - Search result ordering

