LISKOV SUBSTITUTION PRINCIPLE

@ferosekhanj

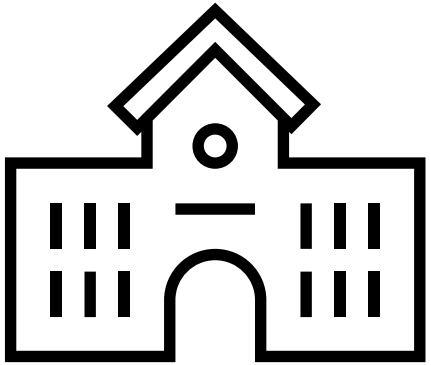
WHAT IS LISKOV SUBSTITUTION PRINCIPLE?

- If S is a subtype of T, then objects of type T may be replaced with objects of type S
- Functions that use pointers or references to base classes must be able to use objects of derived classes without knowing it.

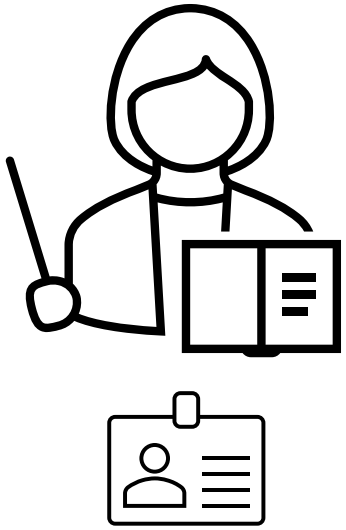
WHAT SHOULD DERIVED/SUB TYPES ADHERE TO?

- Function Signature
  - Contravariance of method parameter types in the subtype.
  - Covariance of method return types in the subtype.
  - New exceptions cannot be thrown by the methods in the subtype, except if they are subtypes of exceptions thrown by the methods of the supertype.
- Behavioral conditions
  - Preconditions cannot be strengthened in the subtype.
  - Postconditions cannot be weakened in the subtype.
  - Invariants must be preserved in the subtype.
  - History constraint. Respect the historical assumptions made by the base.

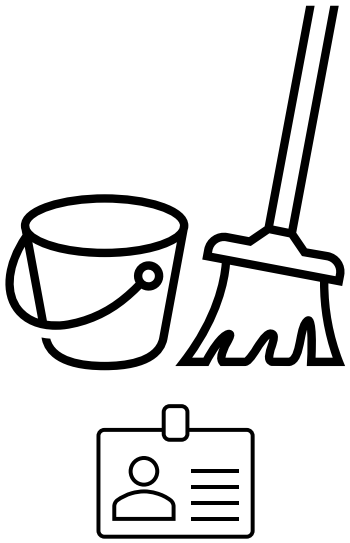
School



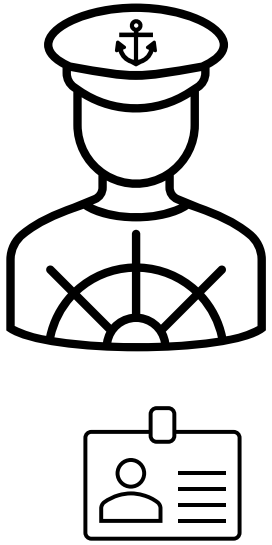
Teaching Staff

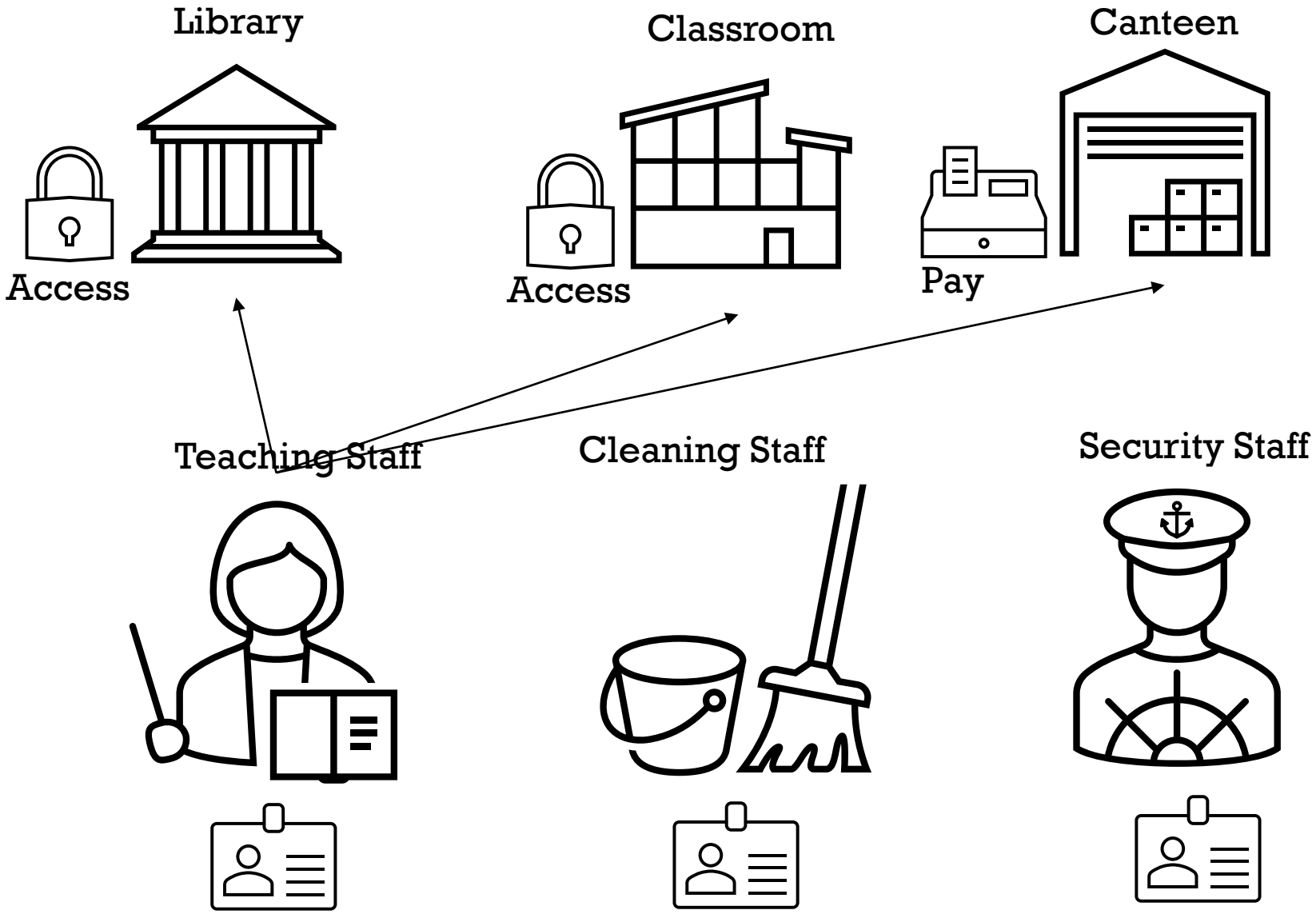


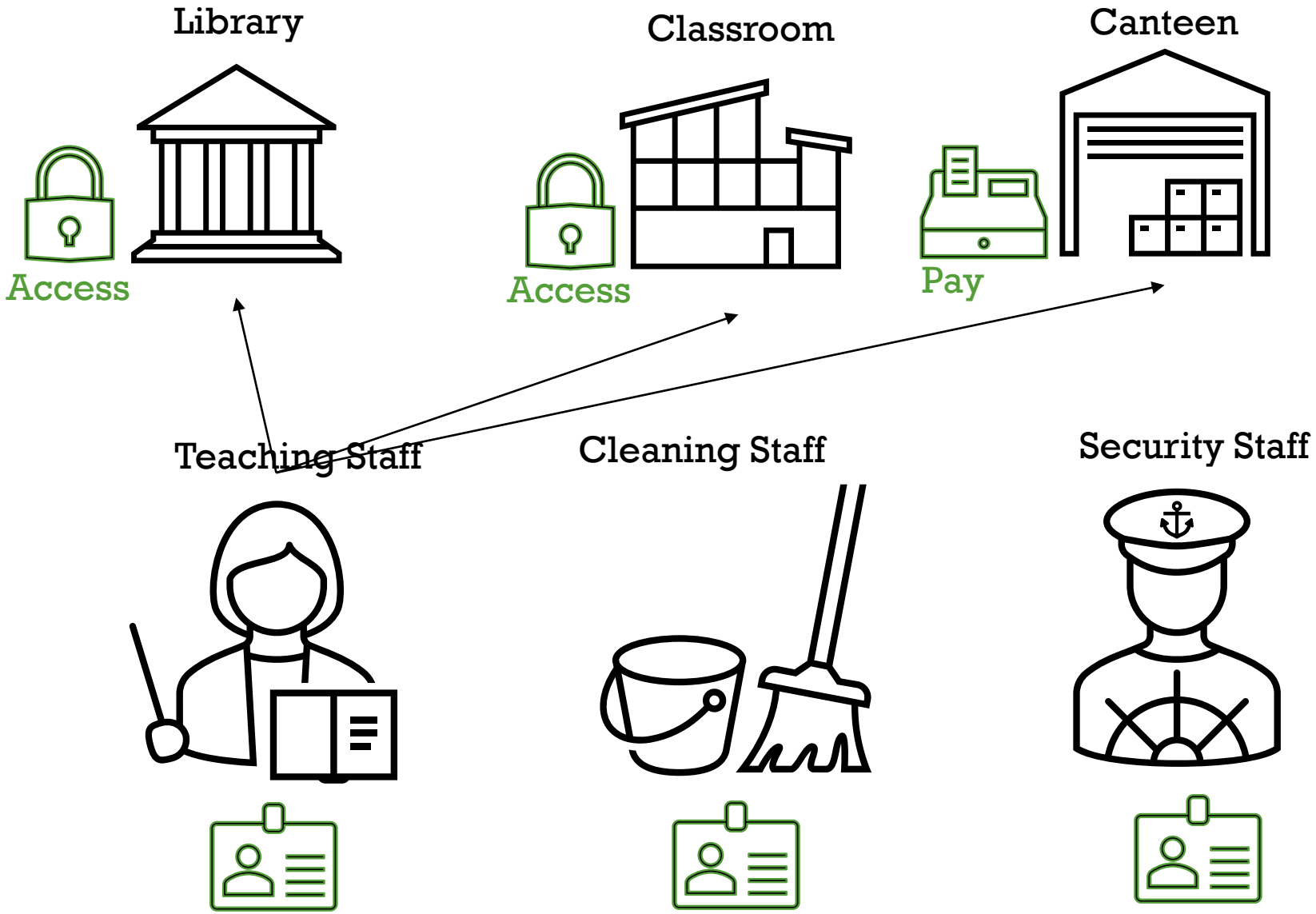
Cleaning Staff



Security Staff




Library
Classroom
Canteen
Access
Access
Pay
Teaching Staff
Cleaning Staff
Security Staff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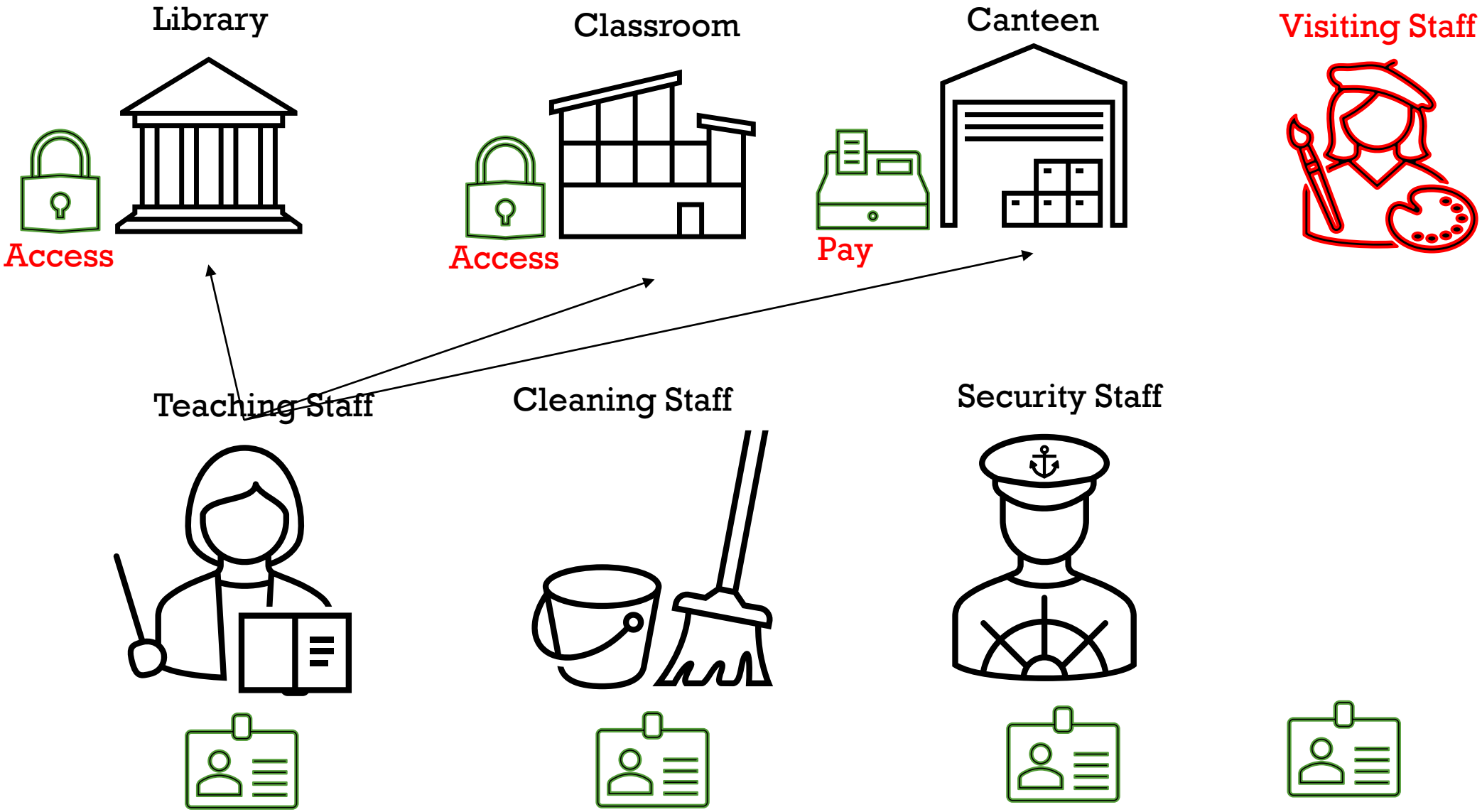
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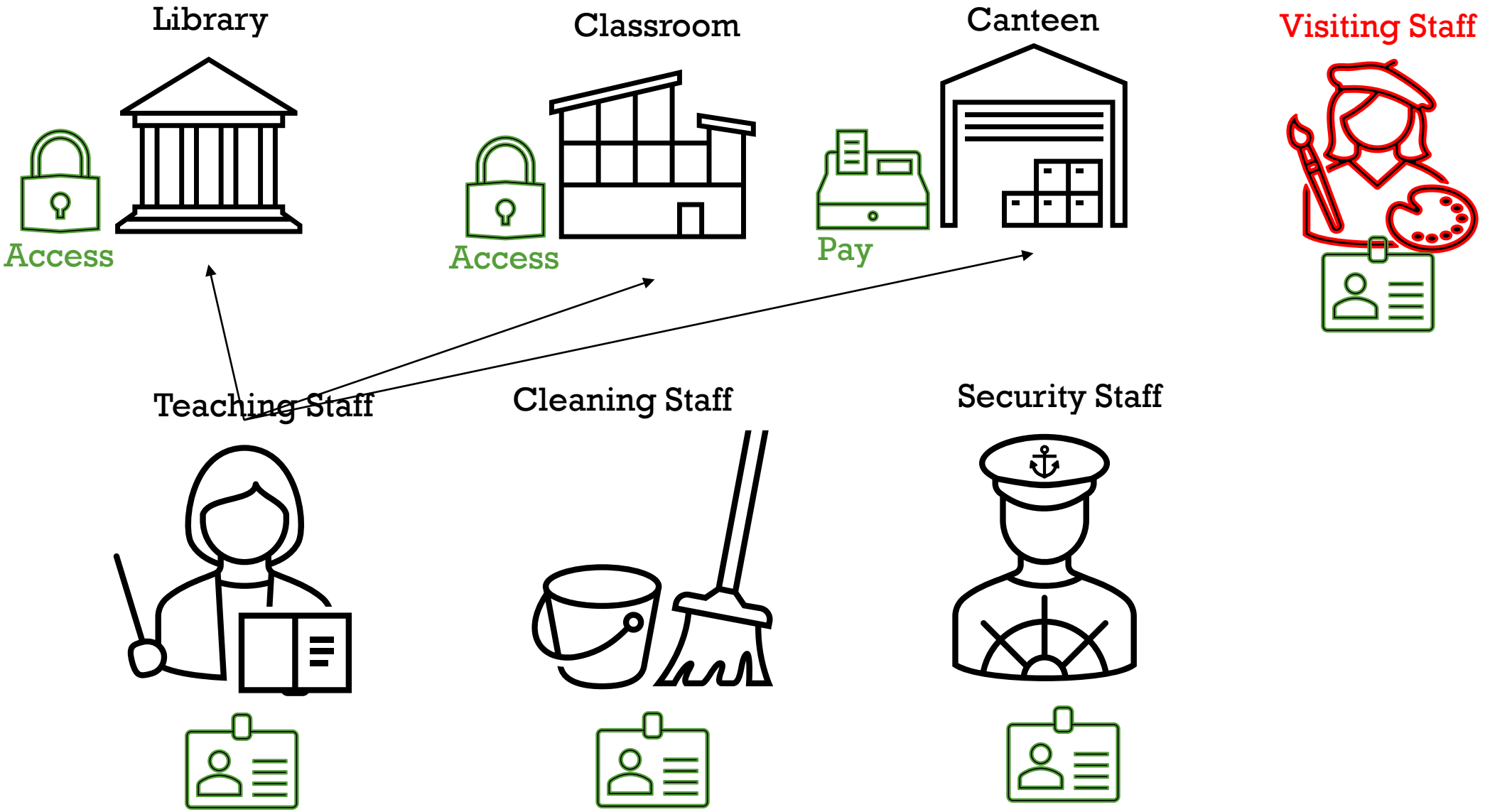
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LET'S CREATE THE SOFTWARE ABSTRACTION...

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STAFF

- Name
- RollNumber
- IsActive
- LogEntry()
- LogExit()
- ChargeExpense()

SYSTEMS OPEN FOR EXTENSION CLOSED FOR MODIFICATION

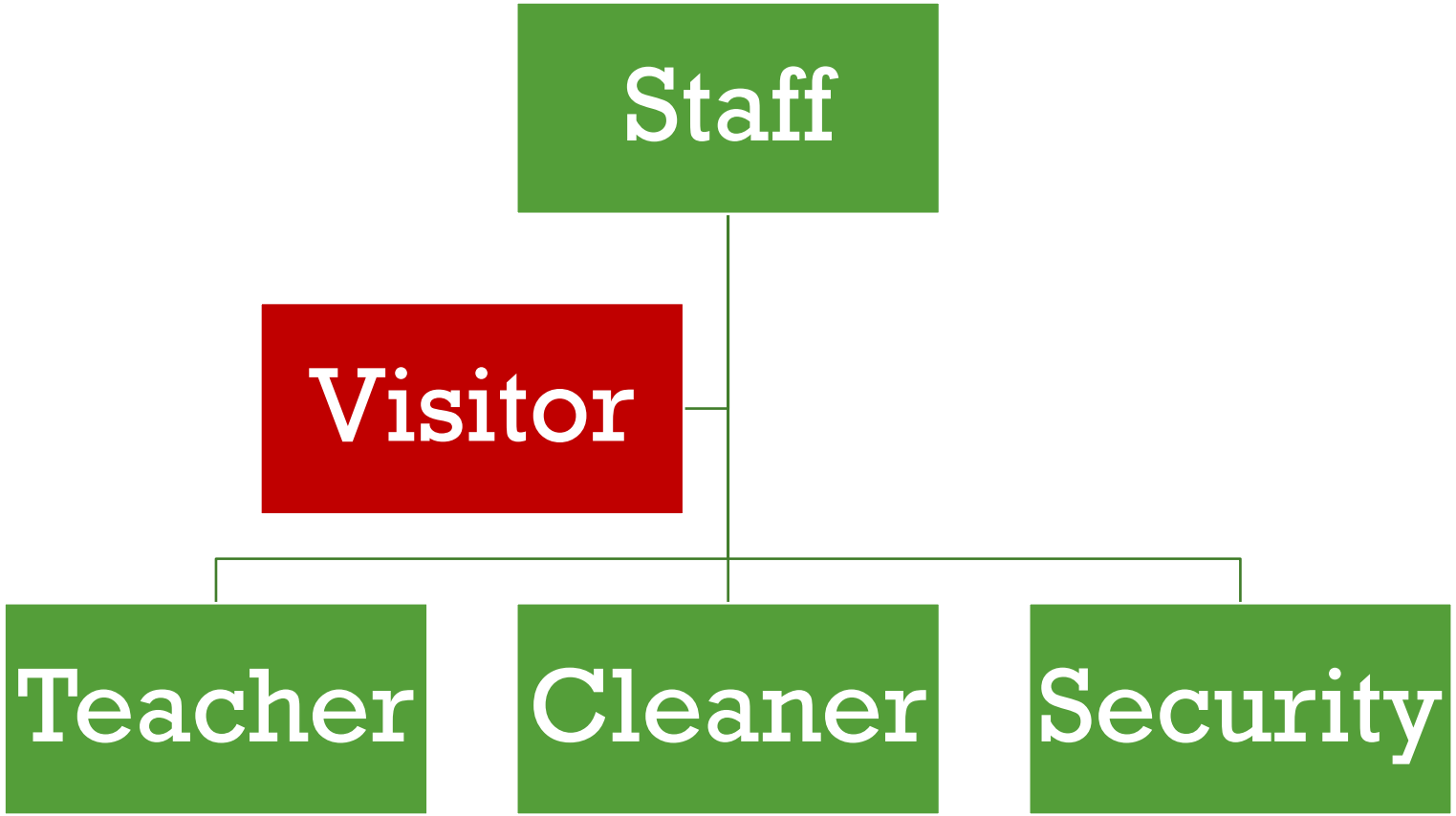
Library

Classroom

Canteen

LET'S LOOK AT THE CODE.

WE HAVE A NEW OBJECT IN OUR SYSTEM



HOW TO INCLUDE THE VISITOR IN OUR SOLUTION?

- Either change the system to handle the visitor as a special case
  - Modify Classroom, Library & Canteen
  - But this will break OCP
- Or make the visitor as a kind of staff

LET'S LOOK AT THE CODE.

ENSURE LISKOV SUBSTITUTION PRINCIPLE IS ADHERED TO

- All the staff methods shall behave in the same way for the Visitor

THANKS