

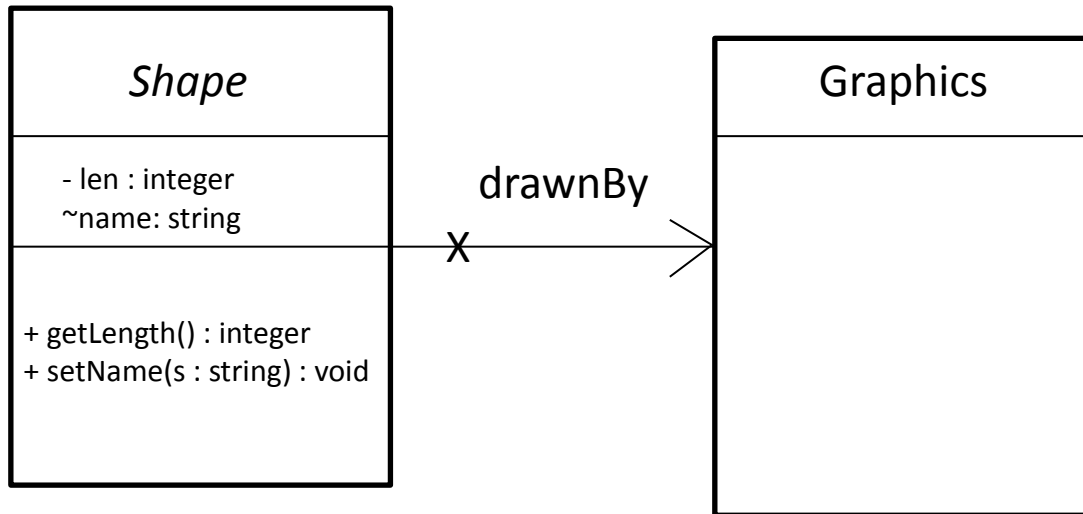
Name: _____

GT Login Id: _____

I certify that I have complied with the Georgia Institute of Technology honor code during this examination. I have neither received nor given help during the exam. NO CELL PHONES, IPODS or other devices may be used during the exam. Please turn off all electronic devices that will make a noise during the exam.

Signed: _____

3. (15 Points) Translate the following UML representation to valid Java code.



4. (2 Points) (True/False) A supporting actor in a use case is like Banner for the T-Square system. It is typically an external entity that our system will use, not that will use our system.

5. (5 Points) What was a key insight from Alan Kay's biology background that led him to create Object-Oriented design?
6. (8 Points) Briefly discuss at least two GRASP principles which are supported by the classic Model-View-Presenter paradigm.
7. (3 Points) The most important thing about the analysis phase of the project is:
 - a. Draw a good domain model
 - b. Create a good robustness diagram
 - c. Write some good use cases
 - d. Understand the customer problem

8. (5 Points) Given this Sprint backlog, and assuming Sprints last 5 weeks, what should be your action as a project manager?

Task	Person Responsible	Status	1	2	3
Design DB Table	Bob	Started	20	10	5
Design UI	Fred	Completed	10	2	0
Design DB API	Sally	Started	30	20	20
Code Login	Freda	Started	20	10	5
Code Backing Bean	Naomi	Started	10	20	25
Total			90	62	50

9. (12 Points) We are developing the Mark 27 Tricorder for Star Fleet Command. Our use case is scan for life forms.

The steps in the success scenario are:

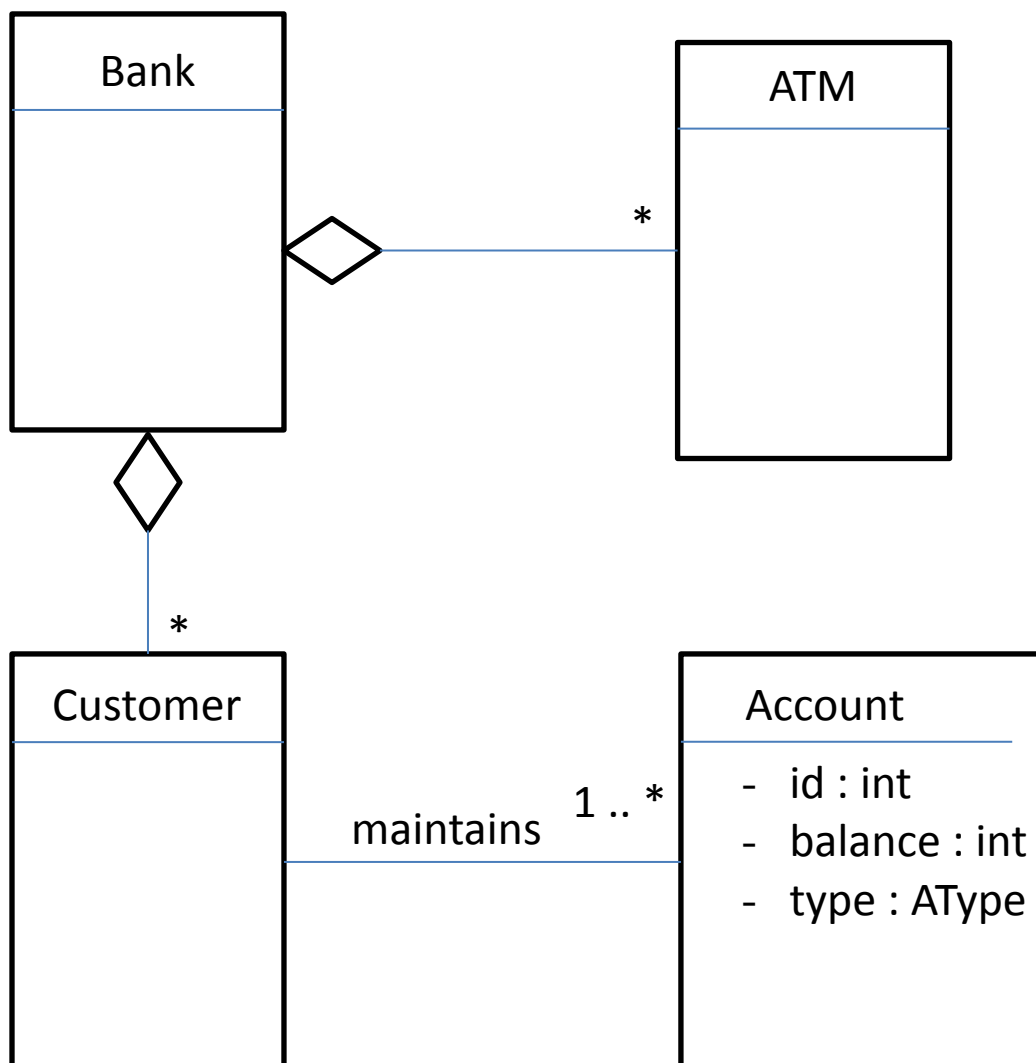
Trigger: Operator presses the SCAN button.

1. System activates the sensor array.
2. Sensor data is processed.
3. If processing was successful, the operator is prompted for display type, and the data is formatted and displayed.
4. If processing was unsuccessful, an error message is displayed.

The use case diagram has an external actor called Operator. The class diagram has the following classes and methods: **KeyHandler** with operation **KeyPress (keyid)**; **SensorArray** with operation **activate** returning Data; **DataAnalyzer** with operation **process** taking a parameter of Data and returning a Boolean (true if successful); and **Display** with operations: **prompt**, **showErrorMessage**, **formatData** and **display**. Draw a UML sequence diagram for this scenario (including the success and unsuccessful cases).

10. (8 Points) Briefly describe how you would use a Robustness diagram to check your use case and domain model for consistency.

The following class diagram will be used for the next few questions which deal with design principles. You should **identify a principle** that applies to the example, and then state whether the example complies with the principle or **how you would fix it** so that it does comply (there are no trick java syntax questions, these are all about design either GRASP or SOLID).



11. (5 Points) During a design review, you notice code like this in the Customer class:

```
for (Account a : myAccounts) {  
    switch(a.getType()) {  
        case SAVINGS: //does some stuff here  
        case INVESTMENT: //does some different stuff  
        case CHECKING: //does some stuff  
    }  
}
```

12. (5 Points) You notice some code like this in the Bank class:

```
int getTotalCustomerAssets() {  
    int total = 0;  
    for (Customer c : myCustomers) {  
        for (Account a : c.getAccounts()) {  
            total += a.getBalance();  
        }  
    }  
    return total;  
}
```


13. (5 Points) You notice code like this in the Account class:

```
this.getMyCustomer().getMyBank().getMyATM().checkStatus();
```

14. (5 Points) The bank buys a new ATM machine. Who should create an instance of the new ATM? Briefly justify your choice.

15. (5 Points) You need to hook a UI up to your application. Briefly describe how the Controller and Pure Fabrication principles could help.

16. (5 Points) Concerning method contracts, why would a programmer care about a precondition that was not just “true”, i.e. what special things (if any) are imposed on you if a method does have a precondition?