8. functional cohesion :

we put the codes in many different parts.

When customer insert Card we just call "insertCard" to perform.

+0

Wheh we want to set the cash in ATM machine we just call "setCashInMachine" to perform.

Others condition is same.

Every part of this code focus on their own function.

We just call what we need.

data coupling :

```
void setATMState(ATMState newATMState){
    atmState = newATMState;
}
public void setCashInMachine(int newCashInMachine){
    cashInMachine = newCashInMachine;
}
```

only sent the data that function need

System Analysis & Design

Final Exam

6/10/2018

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✓1. Preconditions and postconditions can be used to specify dependencies among operations in the same class. Please select the right statement for the following situations. **8%**

1) To ensure that we invoke TournamentControl to select sponsor only once. 4

2) To assume that the Player is not yet part of the Tournament of interest. 1

3) To ensure that sponsors cannot be selected before there are interested advertisers. 3

4) To specify how TournamentControl sets the advertisers association when select sponsor. 2

context TournamentControl::IsPlayerOverbooked(p) **pre:** not p.tournaments->includes(self.tournament)	(1)

context TournamentControl:: selectSponsors (advertisers) **post:** tournament.sponsors->sponsors.equals(advertisers)	(2)

context TournamentControl::selectSponsors (advertisers) **pre:** interestedSponsors->notEmpty()	(3)

context TournamentControl::selectSponsors (advertisers) **pre:** tournament.sponsors->isEmpty()	(4)

√

2. Please use structure English or java code to describe the following example of an algorithm specification for a "compute-pay" method associated with an hourly employee class. **6%**

problem doman class

RD

描述

12. Please draw class diagram to explain the following multiple inheritance examples. (Note: you are not allowed to use the examples listed in the textbook.) **10%**

a) Two inherited attributes (or methods) have the same name and semantics.

b) Two inherited attributes (or methods) have different names but with identical semantics; that is they are synonyms.

c) Two inherited attributes (or methods) have the same name but with different semantics; that is, they are homonyms. This also violates the proper use of polymorphism.

V

13. Using the steps of normalization, create a model that represents the file of your project in third normal form. Please make necessary assumptions to explain why the tables are related. You need to identify the primary and foreign keys and explain what referential integrity is. **10%**

V

14. We want to map the problem domain classes to RDBMS Schema. Please draw its corresponding diagram. **6%**

parkingNum

Lisense1

Enter time

Leaving time

payment Type

Fee

spaceNum

cameraNum

hour

Total Fee

problem doman class

9. Given the following code of CheckoutGUI class, please identify its interaction coupling. **6%**

```
public class CheckoutGUI       {
    DBMgr dbm=new DBMgr ();
    public void process(String[] cnList) {
        for(int i=0; i<cnList.length; i++) {
        Document d=dbm.getDocument(cnList[i]);
        if (d.isAvailable()) {
            Loan l=new Loan(u, d); dbm.saveLoan(l);
            d.setAvailable(false); dbm.saveDocument(d);
        }
}
```

10. There are six types of interaction coupling including no direct coupling, data coupling, stamp coupling, control coupling, common or global coupling, and content or pathological coupling. Please state the type of interaction for the following situations.

    1) The object "invoice" passes the value of a variable to "calculate tax" the taxable amount. ___data___ **2%**

    2) The print routine of the customer billing accepts customer data structure as an argument, parses it, and prints the name, address, and billing information. ___stamp___ **2%**

11. There are six types of interaction cohesion including functional, sequential, communicational, procedural, temporal or classical, logical, and coincidental. Please state the type of cohesion for the following situations.

    1) A system initialization routine: this routine contains all of the code for initializing all of the parts of the system. Lots of different activities occur, all at init time. ___temporal___ **2%**

    2) A method that updates customer records, calculates loan payments, prints exception reports, and analyzes competitor pricing structures. ___coincidental___ **2%**.

    3) An object "calculate totals" will keep a running total of the quantity times price subtotal for each item. ___communicational___ **2%**

8. Please describe the interaction coupling (LoD) based on the given code as below. Please also identify the level of cohesion of the class ATMMachine. **10%**

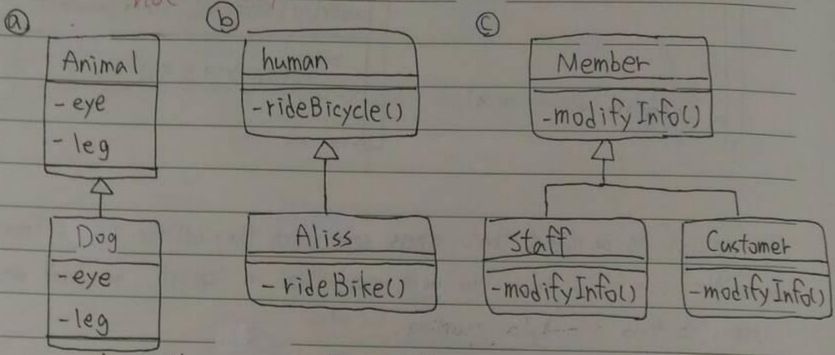
```
public interface ATMState {
    void insertCard();
    void ejectCard();
}

public class ATMMachine {        ATMState atmOutOfMoney;
    ATMState hasCard;            ATMState atm state ;
    ATMState noCard;
    int cashInMachine = 2000;

    boolean correctPinEntered = false;

    public ATMMachine(){

        hasCard = new HasCard(this);
        noCard = new NoCard(this);
        atmOutOfMoney = new atmOutOfMoney(this);
        atmState = noCard;

        if(cashInMachine < 0){
            atmState = atmOutOfMoney;
        }
    }
    void setATMState(ATMState newATMState){
        atmState = newATMState;
    }
    public void setCashInMachine(int newCashInMachine){
        cashInMachine = newCashInMachine;
    }
    public void insertCard() {
        atmState.insertCard();
    }
    public void ejectCard() {
        atmState.ejectCard();
    }
}
```

11. ⓐ communicational

"calculate totals" use same data to run total of the quantity times price subtotal.

not multiple inheritance

+ 12.



// a: Animal's eye and leg is the same as Dog's eye and leg.

// b: although name is different, bicycle and bike is the same thing

// c: staff and Customer have the method "modifyInfo()"
but staff can modify every customer's information
customer only can modify themselves information.