

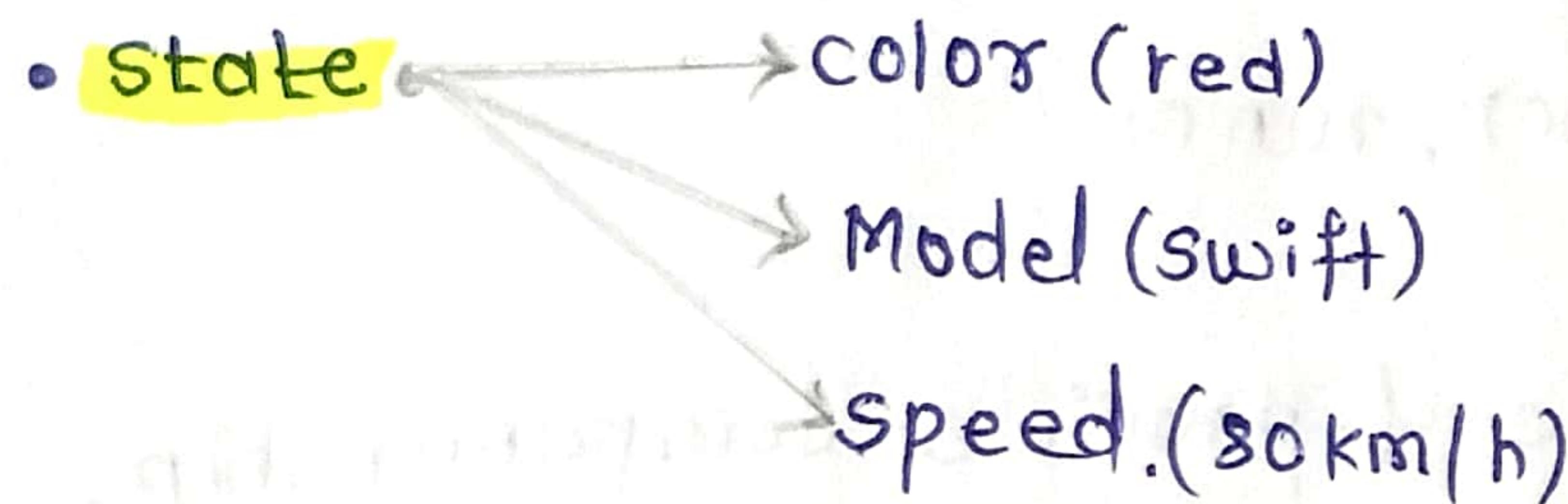
Name :- Nita Sanjay Waghchaure.
Batch :- 8th August Java Full stack
FRN :- 16J0825/012

• class:

Object:

► Example :

1) car



- Behavior → start()

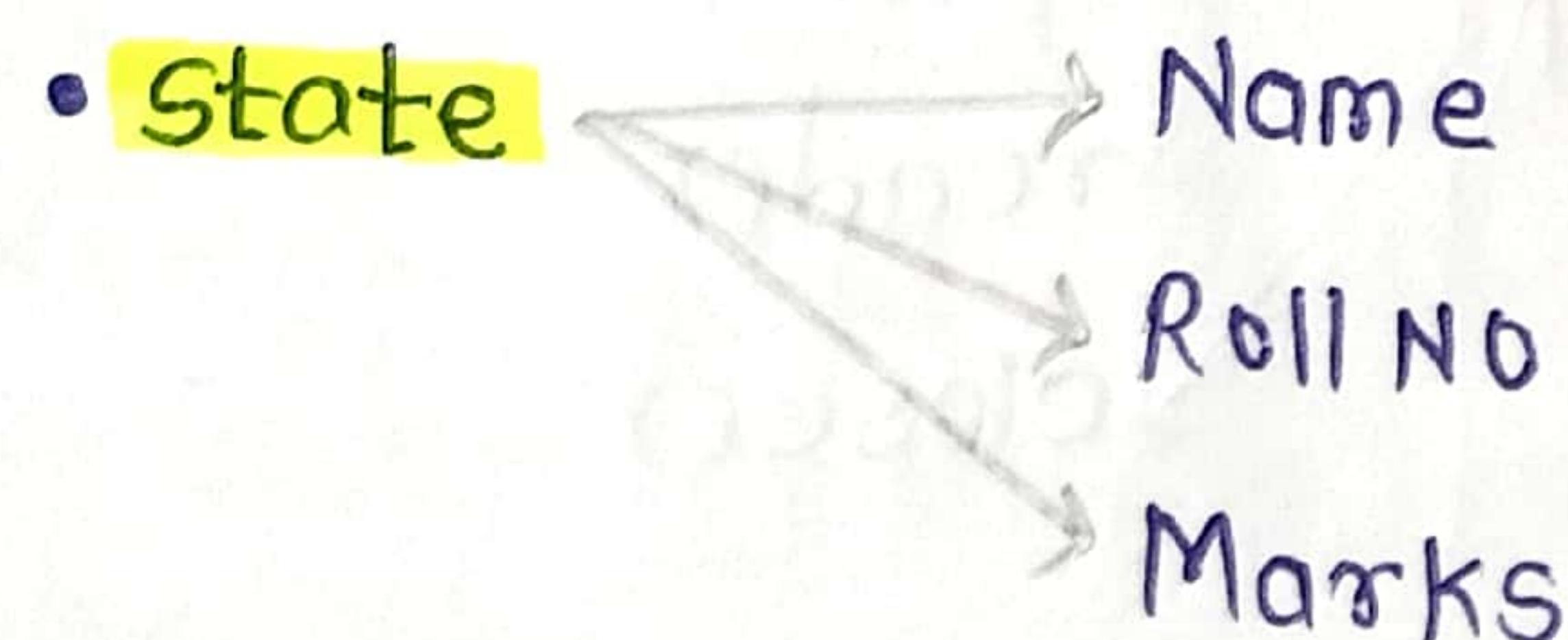
- Behavior → Accelerate()

- Behavior → Stop() place

- Identity : car1

- Responsibility : To transport from one another.

2) Student



- Behaviour → study()

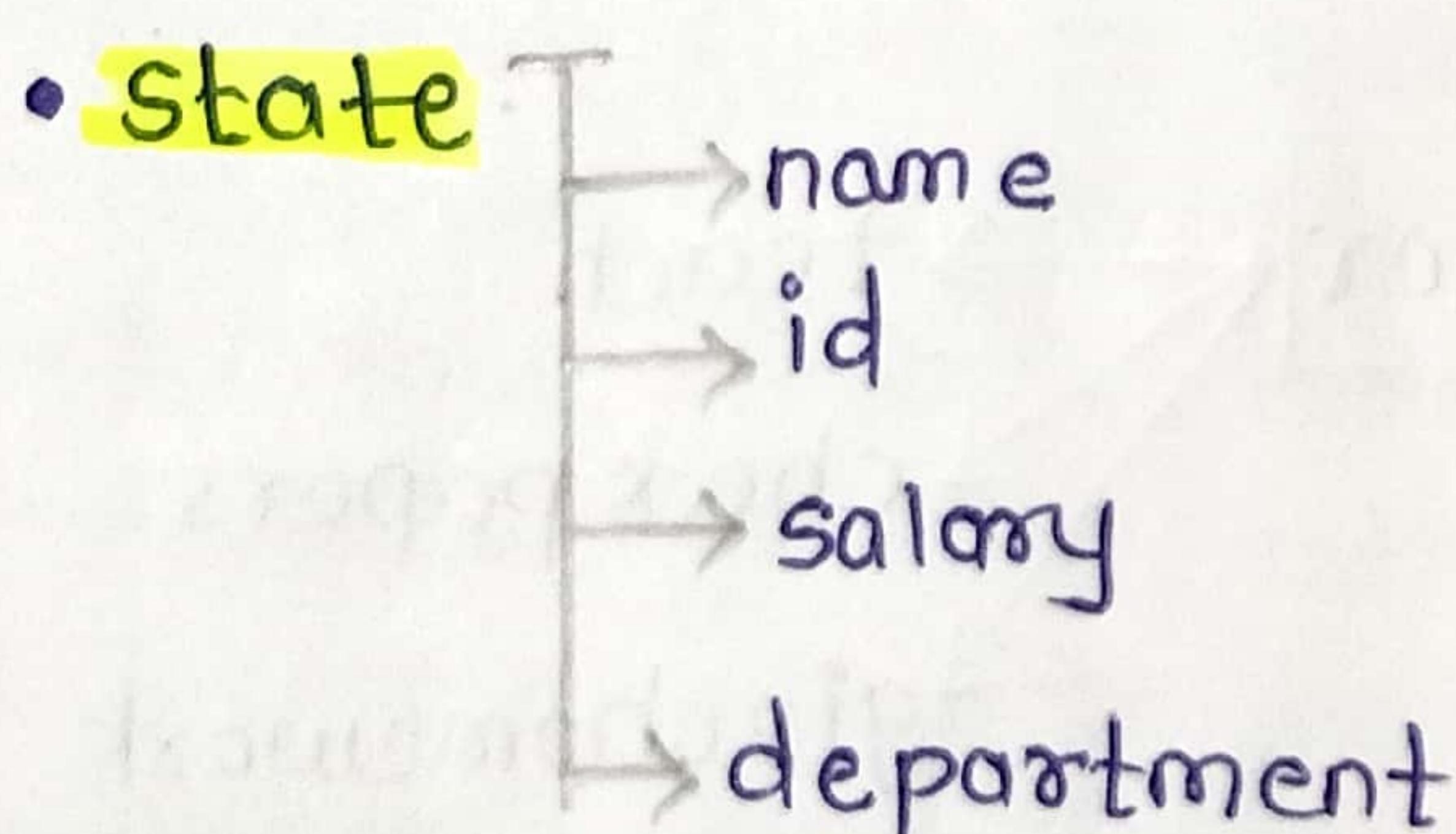
- Behaviour → WriteExam()

- Behaviour → showResult()

- Identity : Student1

- Responsibility : To learn & give exams.

3) Employee



- Behavior → Work()

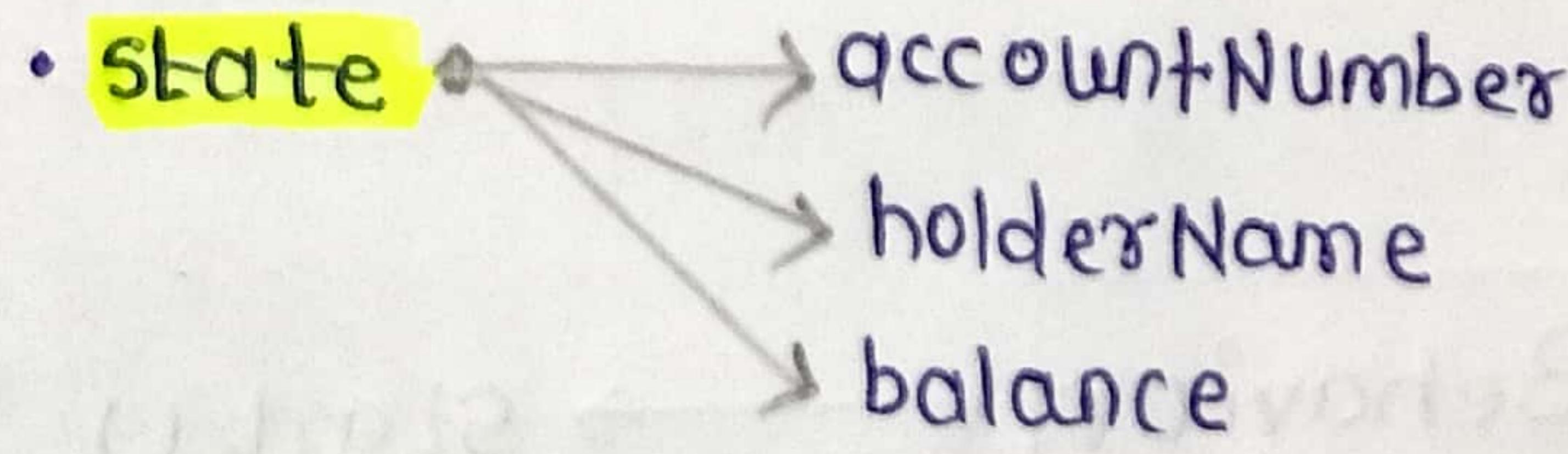
- Behavior → attendMeeting()

- Behavior → ShowSalary()

- Identity : emp1

- Responsibility : perform assigned job duties

4) BankAccount



- Behavior → deposit()

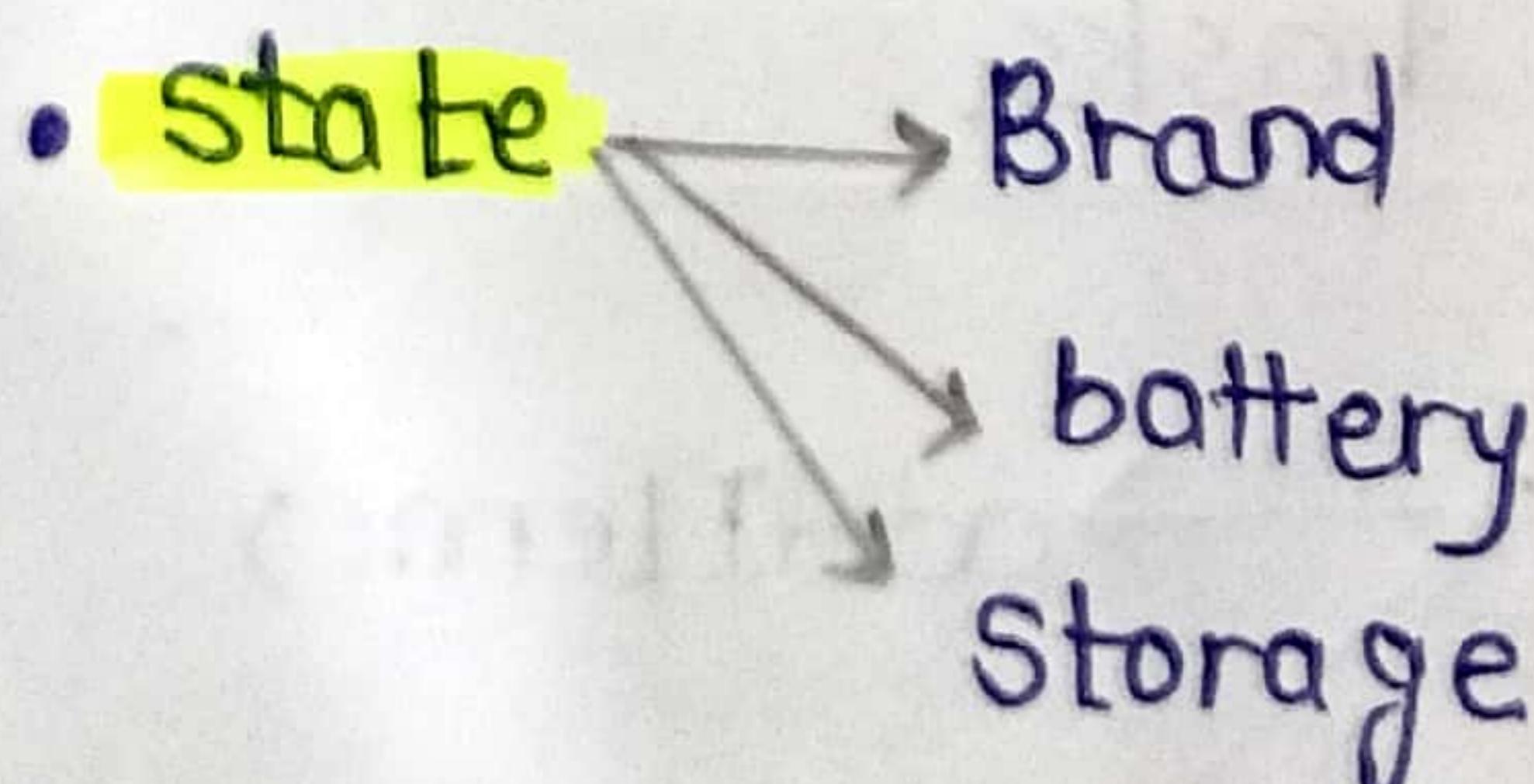
- Behavior → withdraw()

- Behavior → checkBalance()

- Identity : acc1

- Responsibility : To manage money transaction securely.

5) Mobile phone



- Behavior → call()

- Behavior → Message()

- Behavior → charge()

- Behavior → takephoto()

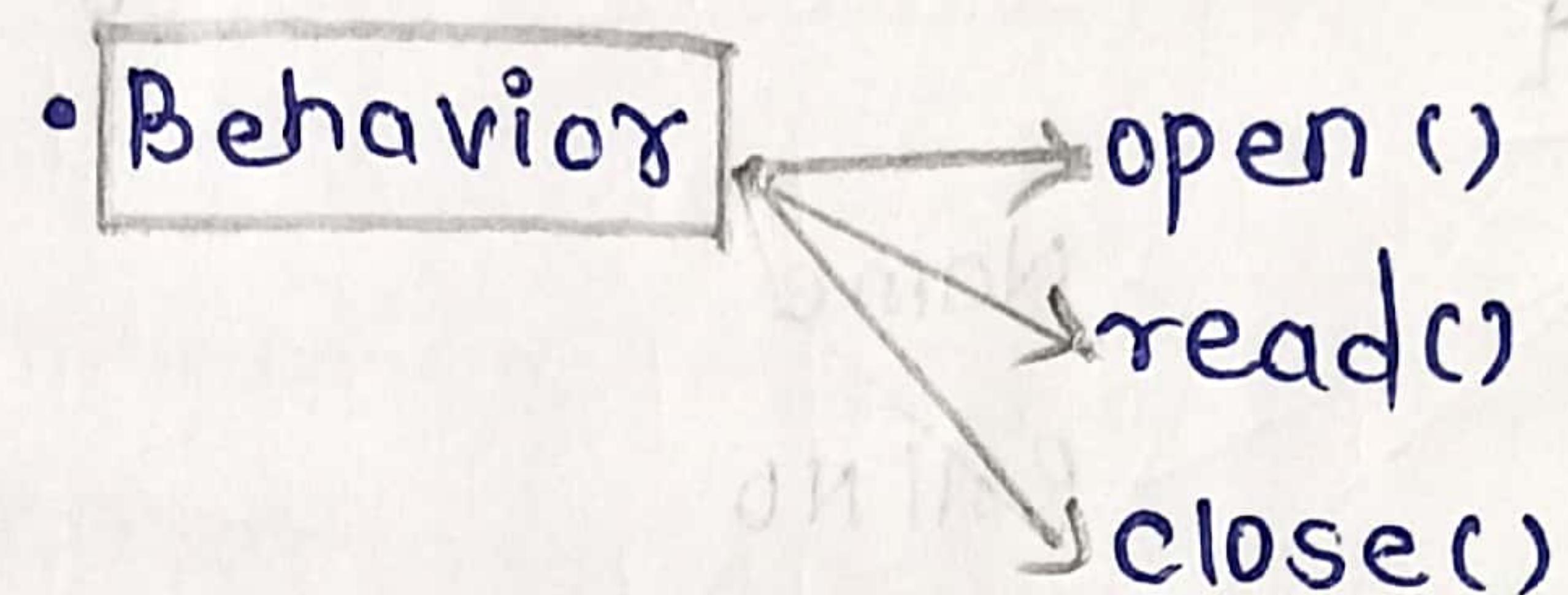
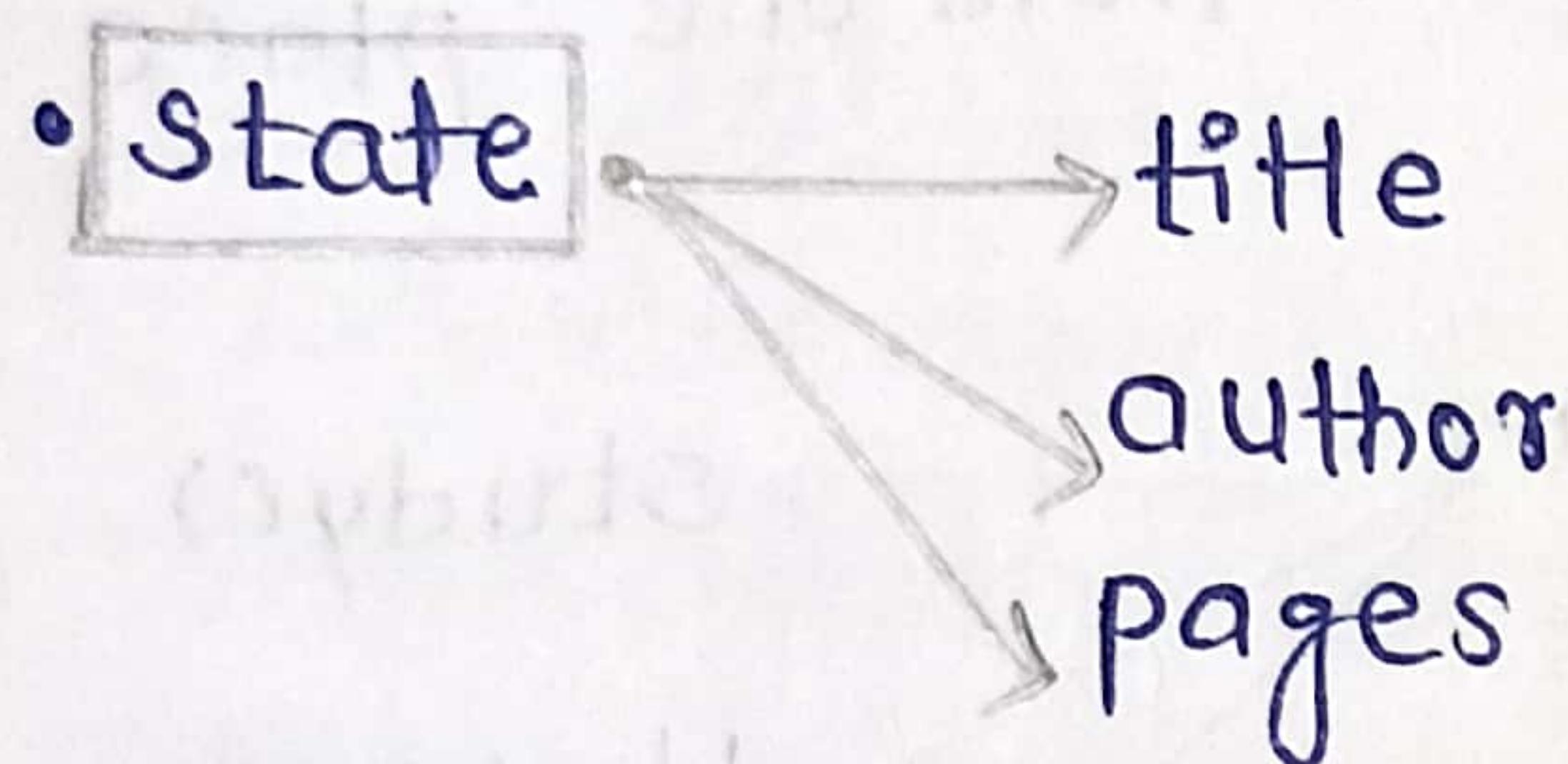
- Identity : - phone1

- Responsibility : To communicate & perform digital tasks .

6) Dog

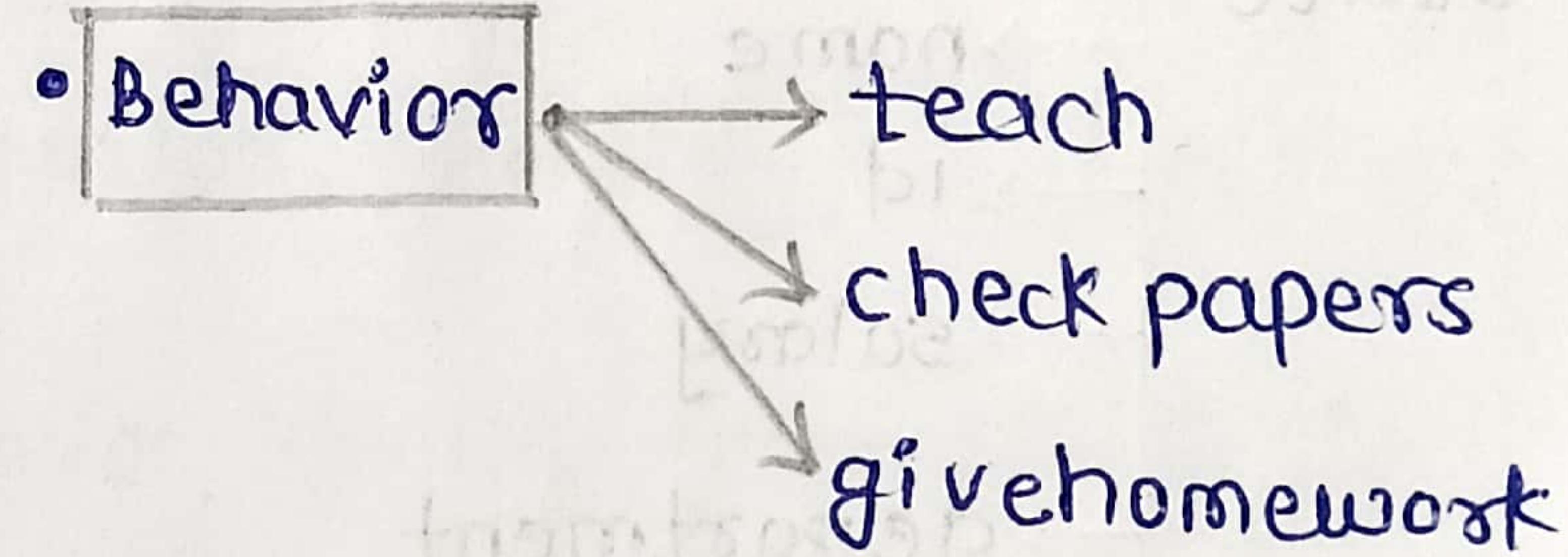
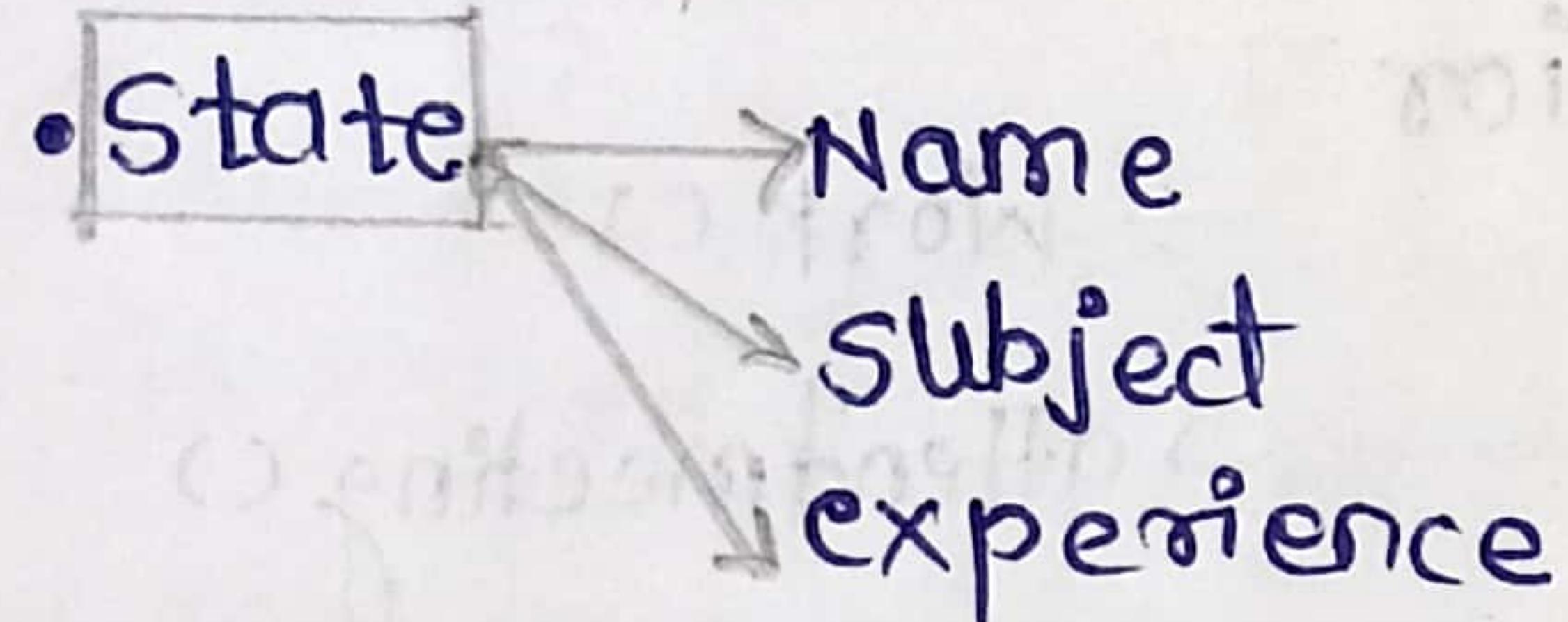
- State :- Name , breed , age .
- Behavior :- bark() , eat() , sleep() , run()
- Identity :- dog1
- Responsibility :- To guard house & provide companionship.

7) BOOK



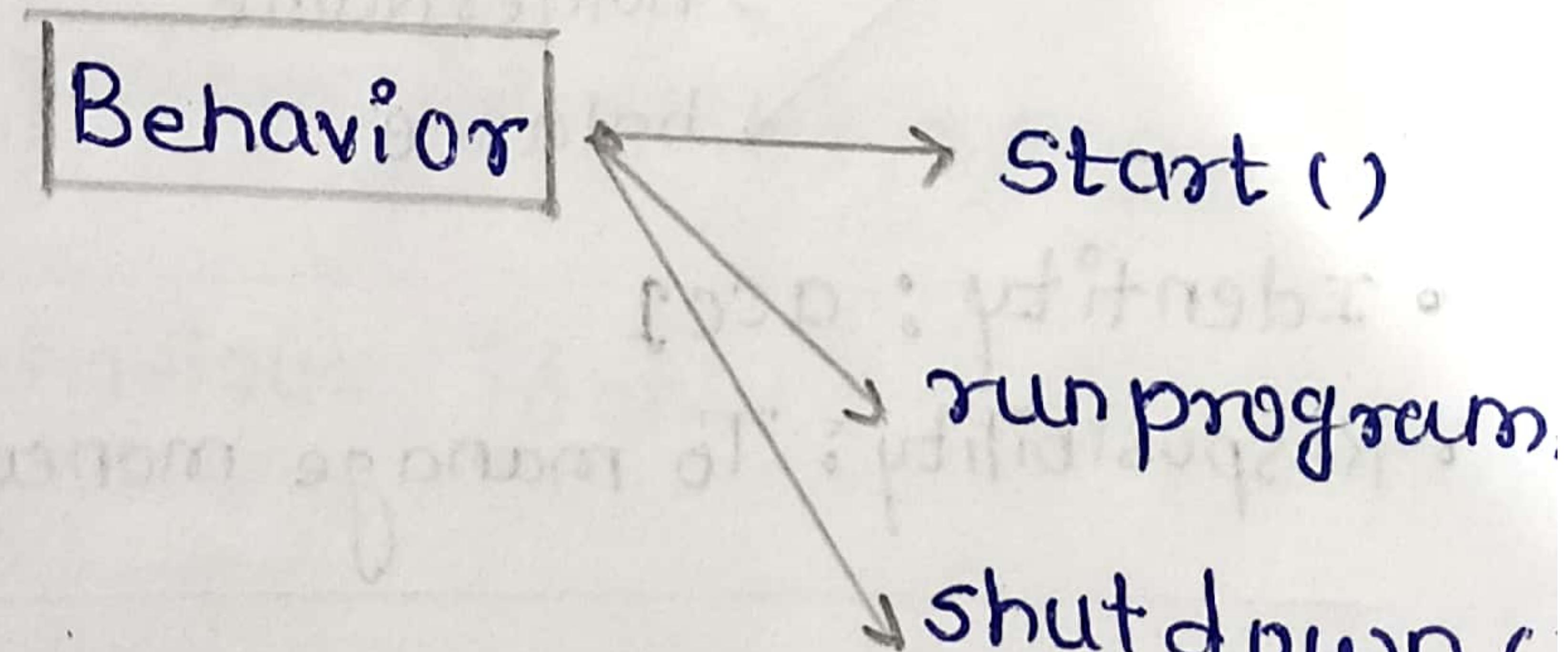
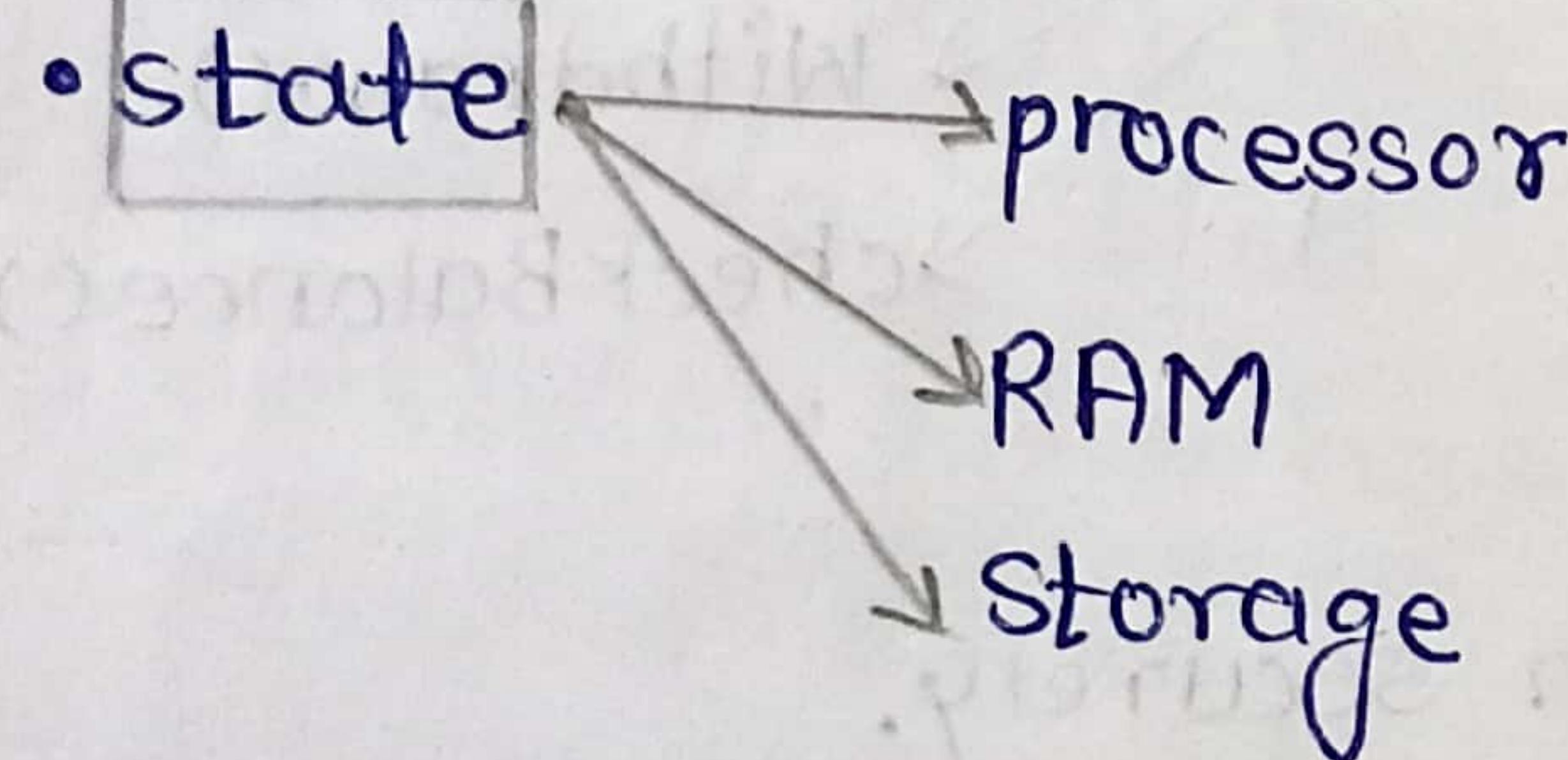
- Identity :- book1
- Responsibility :- To provide information or knowledge.

8) Teacher



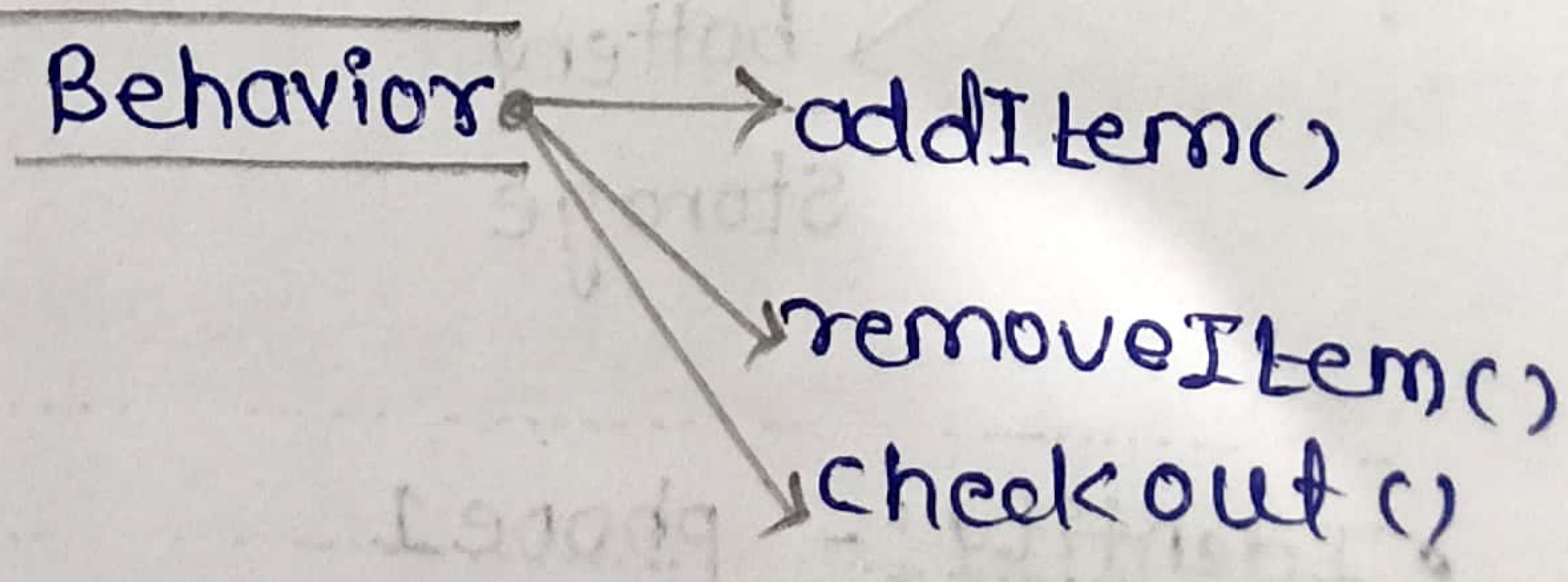
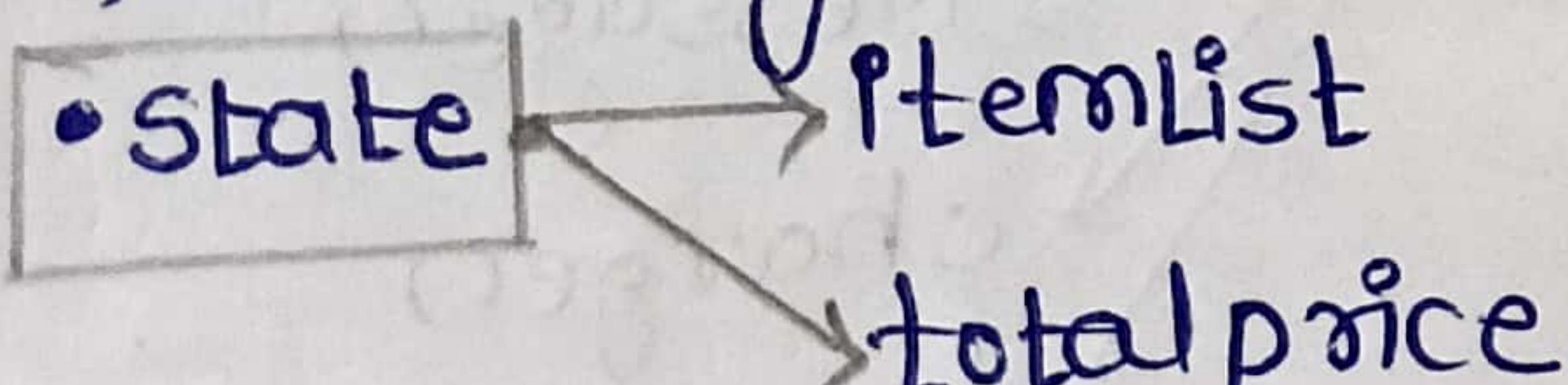
- Identity :- teacher1
- Responsibility : To educate students.

9) computer



- identity : pc1
- Responsibility : To process data & perform tasks.

10) shopping cart



- identity : cart1
- Responsibility : To manage selected products for purchase.

• Example of objects :

1. Object Name : Television
State:

Brand : Samsung
Screen size : 55 inches
Type : Smart LED
Color : Black
Price : 45,000
Model NO : SAMTV55IN

Behavior:

- 1). When the power button is pressed, the TV Turn ON
- 2). Whe the volume button is increased, The sound becomes louder.
- 3). When the channel button is pressed, the channel changes.
- 4). When remote power button is pressed, the TV turns off.

Identity:

- serial NO: SAMTV55IN.

Responsibility:

- 1> Display visual & audio output clearly.
- 2>. Respond quickly to remote control commands.
- 3>. Maintain screen brightness & contrast accurately.
- 4>. provide internet access for smart TV functions.

2. Object Name :- Refrigerator

State :

Brand : LG

Capacity : 250 Liters

Color : Silver

Type : Double Door

power : Rating 230V

Model No : LGFR250L

Behavior :

- 1). When the door is closed, cooling resumes automatically.
- 2). When the thermostat is increased, cooling power increases.
- 3). When the door is opened, the interior light turns on.

Identity :

- Serial No : LGFR250L

Responsibility :

- 1). Maintain consistent cooling temperature.
- 2). preserve food freshness.
- 3). operate efficiently with low power consumption.

Object ID: 02/11/2023
Name: Laptop

State:

Brand: HP

Processor: Intel i5

RAM: 8GB

Storage: 512GB SSD

Color: Silver

Model: HP15SF2024

Behavior:

- 1). When the power button is pressed, the laptop boots up.
- 2). When a key is pressed, it performs its respective action.
- 3). When the lid is closed, the laptop enters sleep mode.

Identity:

- serial no: HP15SF2024

Responsibility:

- 1). Execute user commands accurately.
- 2). process data efficiently.
- 3). Manage files & software securely.

02/11/2025

4. Object Name : Mobile phone

State :

Brand : oneplus
Model : Nord CE3
RAM : 8GB
Storage : 128GB
color : Blue
price : 22,000

Behavior :

- 1). When the power button is long-pressed, The phone turns ON/OFF.
- 2). When a call comes, Then phone rings or vibrates
- 3). When an app icon is tapped ,the app opens.

Identity :

- IMEI NO : 35892456

Responsibility :

- 1). Allow communication through calls & messages.
- 2). provide internet access & app services.
- 3). Store & protect user data.

5. Washing Machine

State:

Brand : Whirlpool

Type : front load

Capacity : 7kg

Color : White

Model : WHIRL7KG

Behavior:

- 1). When start is pressed, washing begins.
- 2). When rinse mode is selected, water drains and refills.
- 3). When cycle completes, the buzzer sounds.

Identity:

Serial No : WHIRL7KG

Responsibility:

- 1). clean clothes efficiently.
- 2). maintain correct wash cycle time.
- 3). use optimal water & detergent.

6. Pen

State:

Brand : Reynolds

Ink color : Blue

Body material : plastic

Length : 14cm

Price : 10

Behavior:

- 1). When the tip touches papers, it writes.
- 2). When cap is closed, ink doesn't dry.
- 3). When ink finishes, it stops writing.

Identity:

- Serial NO: RENPEN2024

Responsibility:

- 1). Write smoothly on paper.
- 2). Avoid ink leakage.
- 3) provide comfortable grip while writing.

7. Table

State:

Material: Wood

Shape : Rectangle

Color : Brown

Height : 2.5 feet

Surface : Smooth

Behavior:

- 1). When items are placed, it holds them steadily.
- 2). When moved, it change position.
- 3). When cleaned, dust is removed.

Identity:

Model NO: TABWOOD2024

Responsibility:

- 1). Provide stable surface for writing or eating.
- 2). Hold objects securely.
- 3). Maintain balance on flat ground.

State:

Material : plastic
capacity : 1 litre
color : Transparent
Brand : Milton
price : 80

Behavior:

- 1). When filled, it stores water.
- 2). When tilted, it pours liquid
- 3). When closed tightly, no leakage occurs.

Identity:

Serial NO: MILBOTTLE 2024

Responsibility:

- 1). store liquids safely.
- 2). prevent spills or leakage.
- 3). Be easy to carry & clean.

9. BagState:

Type : school bag
Material : fabric
color : Red & Black
No. of pocket : 3
Brand : skybags

Behavior:

- 1). When unzipped, books can be kept inside.
- 2). When lifted, it carries weight comfortably.
- 3). When zipped, items remain protected.

Identity:

Model NO: SKYBAG/2024

Responsibility:

- 1). store & protect belongings.
- 2). Be durable & easy to carry.
- 3). Distribute weight evenly on shoulders.

10. Chair

State:

Material: Wood

Color : Brown

Legs : 4

Height : 3 feet

Weight : 6 kg

Behavior:

- 1). When someone sits, it supports their weight.
- 2). When moved, it changes position easily.
- 3). When not in use, it remains stationary.

Identity:

Model NO: WOODCHAIR/2024

Responsibility:

- 1). provides comfortable seating
- 2). maintain stability without breaking.
- 3). support user's posture.

• State

• Behavior :

- Identity:

Abstraction

• Responsibility :

- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.
- Responsibility is refers what object supposed to do.

► Example :

1). car →	Responsible for transporting people or goods.
2). BankAccount	Responsible for managing deposits & withdrawal.
3). Student	Responsible for learning, attending classes, and giving exams.
4). Teacher	Responsible for teaching & evaluating student.
5). Employee	Responsible for performing assigned work & reporting to manager.
6). customer	Responsible for purchasing or ordering products.
7). order	Responsible for maintaining details of item bought.
8). Invoice	Responsible for generating & storing payment information.
9). LibraryBook	Responsible for keeping book details & issuing records.
10). pointer	Responsible for pointing documents or images.

• Abstraction:

- Abstraction means selective ignorance, that is selecting the necessary details & remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting the necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details and remaining details we have to simply ignore.
- Abstraction means selective ignorance, that is selecting necessary details & remaining details we have to simply ignore.
- Abstraction means selection ignorance that is selecting necessary details & remaining details we have to simply ~~is~~ ignore.

2.01 Examples of Abstraction

1) Student

Name, Roll.NO, Email, phone, course, Department, Address, Attendance, Grades, Hobbies.

Used in:

College portal

Name, Roll.NO, course, grades, Attendance

address, Email, Hobbies Ignored.

Library system

Name, Roll.NO, Department, phone.

2. Employee

EmployeeID, Name, Department, salary, joining date, Designation, Address, phone, Email

- payroll system

EmployeeID, salary, Designation.

Address, phone, email ignored.

- Attendance System

Employee ID, Name, Department, joining date.

Address, phone, Email ignored.

3. patient

patient ID, Name, Age, Gender, Address, contact, Disease, Doctor, Room NO, Insurance.

- Hospital Management System

Name, age, Disease, Doctor, Room NO.

- Insurance System

patient ID, Name, Age, Insurance.

Contact, Address, gender ignored.

Contact, Address, gender ignored.

4. Product

productID, name, brand, price, quantity, manufacturingDate, expiryDate, supplierName, category, discount.

► Inventory Management system :-

- product ID • price
- Name • quantity
- Brand • category.

- supplierName, manufacturing Date, expirydate Ignored.

5. course

courseID, courseName, instructor, duration, credits, syllabus, schedule, department, Semester.

► Student portal :-

- courseID • courseName • Instructor
- credits • Department.

Ignored:- Duration, syllabus, schedule, semester.

6. Hotel Room

roomnumber, type, price, status, floor, AC, wifi, bookedby, checkInDate, checkOutDate.

► Booking system :-

- RoomNumber • Type • priceperNight
- status

Ignored:- floor, Ac, Wifi, CheckInDate, checkOut Date.

7. Movie

- MovieID, title, director, producer, duration, genre, releaseDate, rating, language, budget, boxOffice collection.
- Movie Ticket Booking System :-
 - MovieID
 - Title
 - Genre
 - Duration
 - Language.
- Ignored:- Director, producer, rating, releasedate, budget, boxoffice collection.

8. Teacher

- TeacherID, name, subject, qualification, experience, salary, department, email, phone, joining Date, address.
- College Attendance System :-
 - TeacherID
 - Name
 - subject
 - Department
 - Email.
- Ignored:- Qualification, experience, salary, phone, joiningdate, address.

9. Actor

- ActorID, name, age, nationality, gender, awards, debutYear, totalMovies, contactAgent, networth, socialMedia.
- Casting management system :-
 - ActorID
 - Name
 - Nationality
 - gender
 - TotalMovies

Ignored:- Age, Awards, debutyear, contact Agent, networth, Social media.

10. Robot

- RobotID, name, model, FunctionType, batterylife, speed, Sensors, weight, manufacturer, softwareversion, assignedTask.

► Factory Automation System :-

- Robot ID • Name • Function Type
- Battery Life • Assigned task

Ignored :- Model, speed, sensors, weight, sw version.

• Encapsulation:

- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state & behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding and hiding state and behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state and behavior.
- It is way of binding & hiding state and behavior.

Example of Encapsulation:-

1)

Car:

Model : string BMW
 brand : string Black
 regist NO: MHI2AB456f
 fueltype : Diesel
 speed : 80 km/h
 engine : on

Methods

- startengine()
- stop Engine()
- accelerate()
- applybrake

2) Electric Scooter:

brand : ola s1 pro
 color : Matte Green
 battery : 78%
 Speed : 45 km/h
 Mode : ECO
 Reg. NO : MH14AX9876

Methods:

- startRide()
- Stopride()
- switchMode()
- checkBattery()

3). Flower:

name : Rose
 color : Red
 petals : 32
 fragrance : sweet
 Size : medium

Methods:

- bloom()
- grow()
- spreadFragrance()
- Wilt()

4). Dog

Name : Tommy
 breed : Labrodore
 age : 3 years
 color : golden
 weight : 25kg

Methods:

- bark()
- eat()
- run()
- sleep()

02/11/2025 10:24

Type : mango

height : 15ft

age : 5 years

color : Green

fruits : Yes

Methods

- grow()
- give fruit()
- provide shade()
- Absorb water()

6) Shoes

brand : puma

color : Black

size : 8

material : Leather

type : sports

-Methods

- wear()
- tie laces()
- clean shoes()

7) Ball

color : Red

size : medium

type : Rubber

Weight : 200g

brand : cosco

• bounce()

• roll()

• throwBall()

• catchBall()

8) plant

type : Tulsi

height : 2ft

color : green

post size : Medium

age : 1 year

grow()

absorbsunlight()

giveOxygen()

take water()

9) Table

Material : Wood

color : Brown

height : 4ft

shape : Rectangle

KeepItems()

CleanTable()

OpenDrawer()

CloseDrawer()

Material : ceramic

color : White

capacity : 250ml

handle : Yes

temperature : warm

PourTea()

Drink()

Wash()

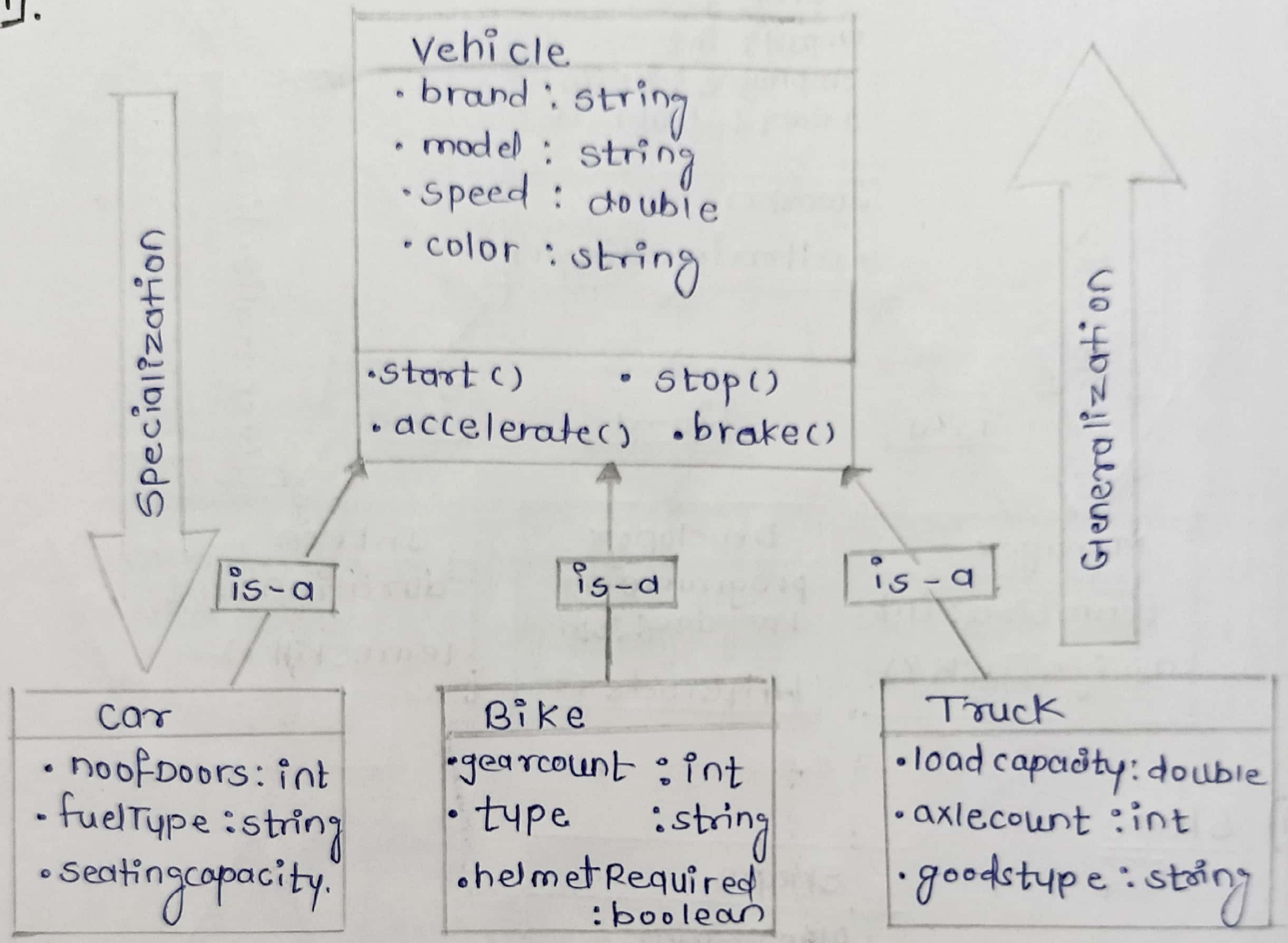
Refill()

- Inheritance

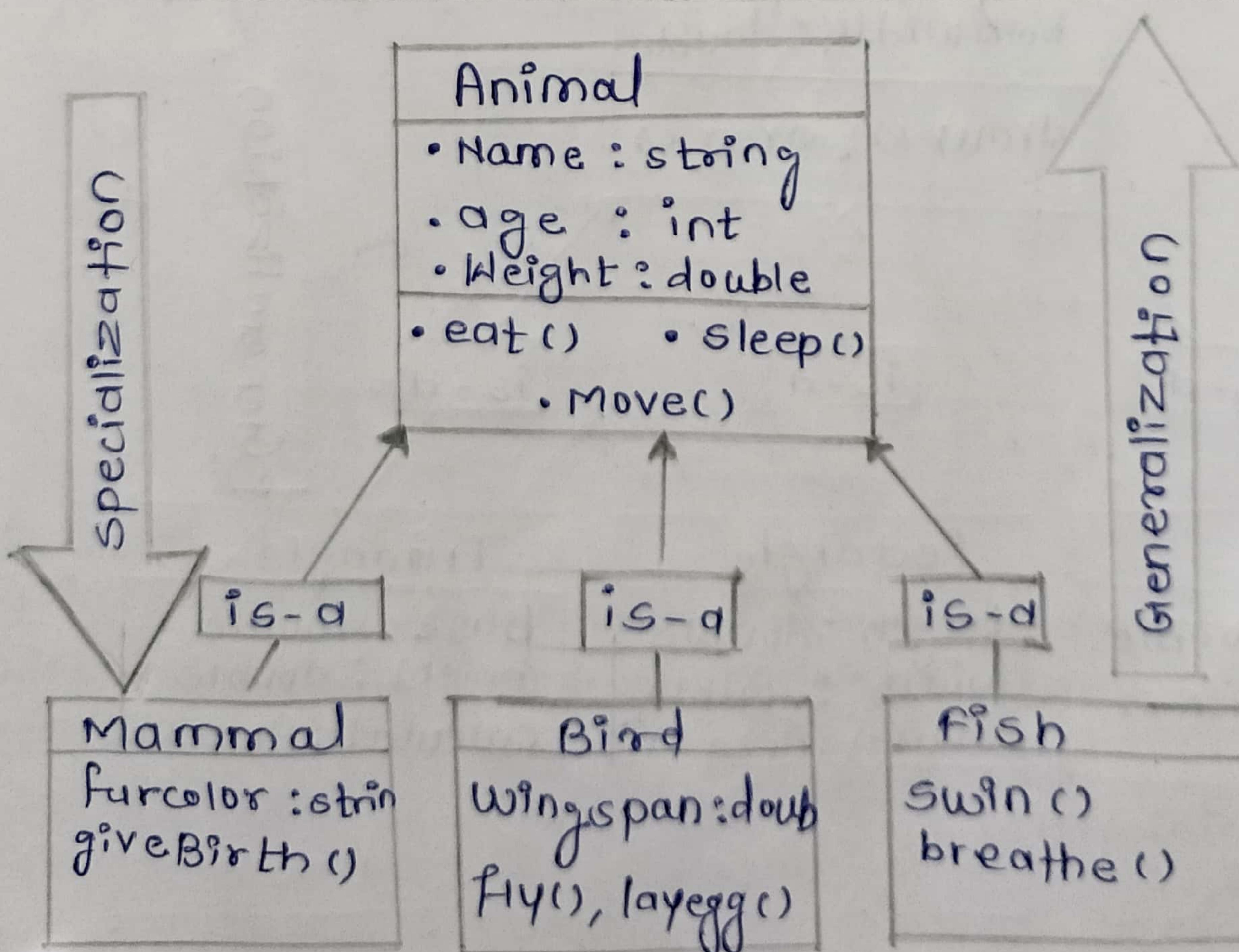
- Way of reusing already defined class with **is-a** relationship
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.
- Way of reusing already defined class with **is-a** relationship.

• Example of Inheritance:

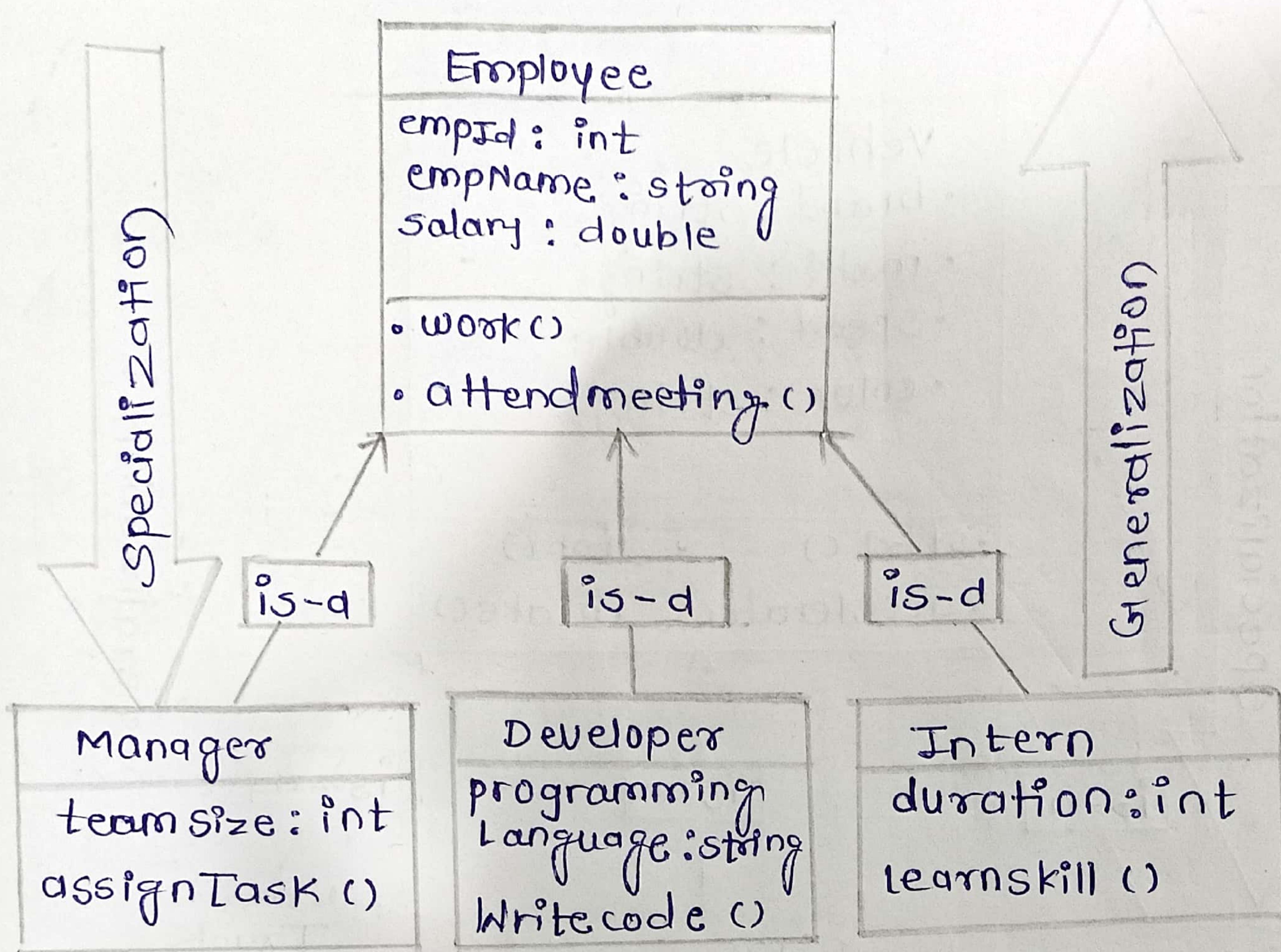
1.



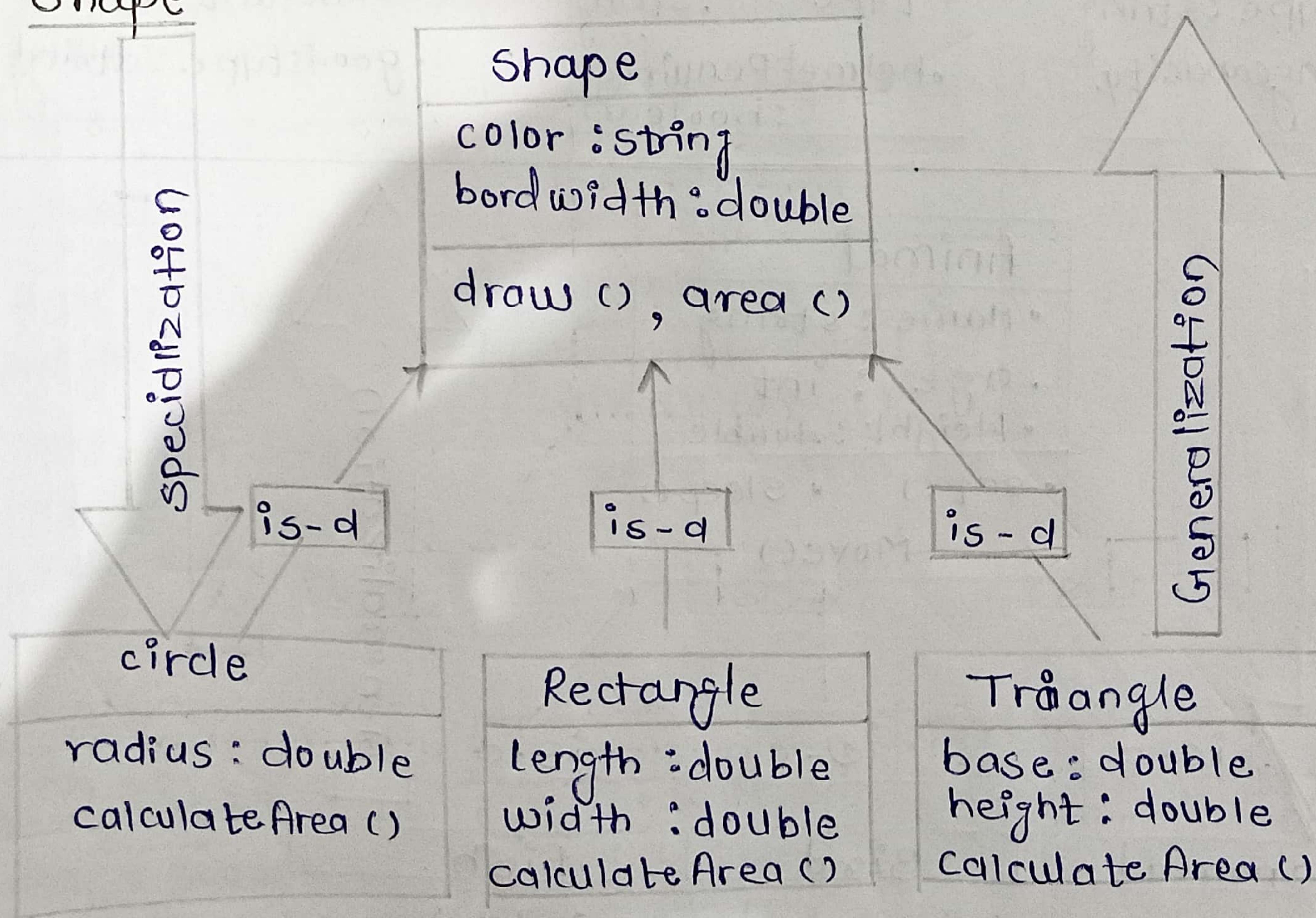
2.



3). Employee

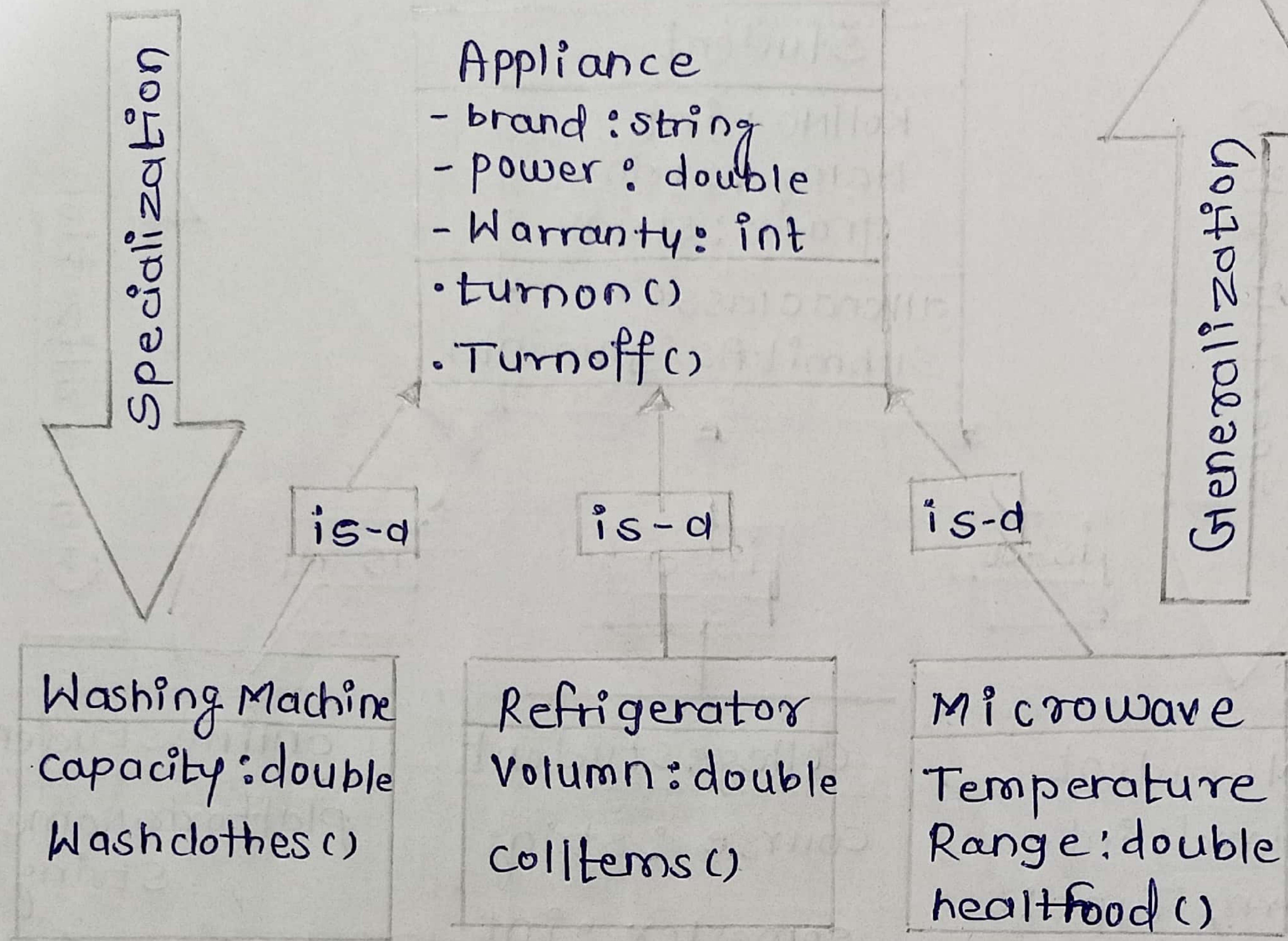


4) Shape

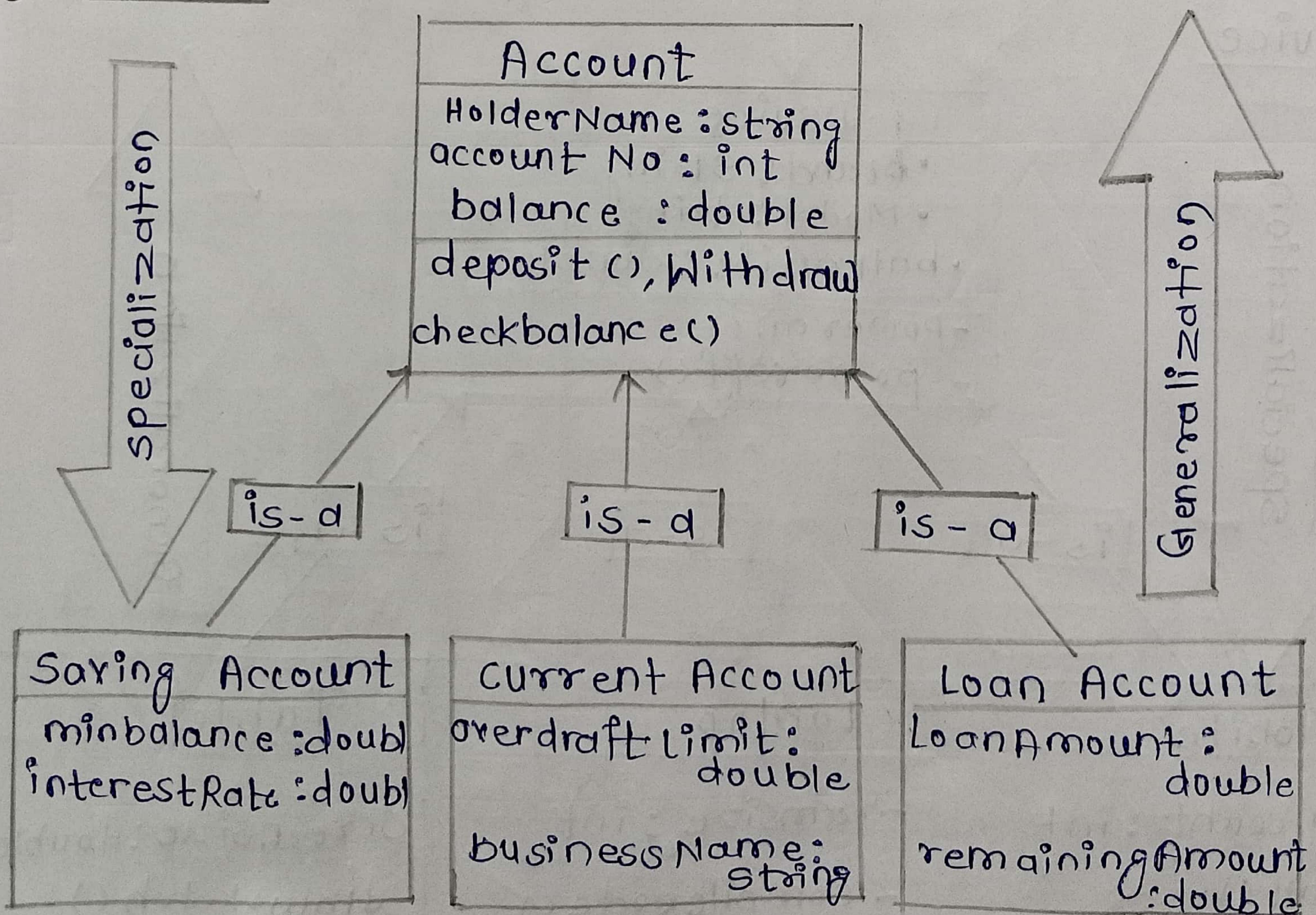


10:25 11/12/2025

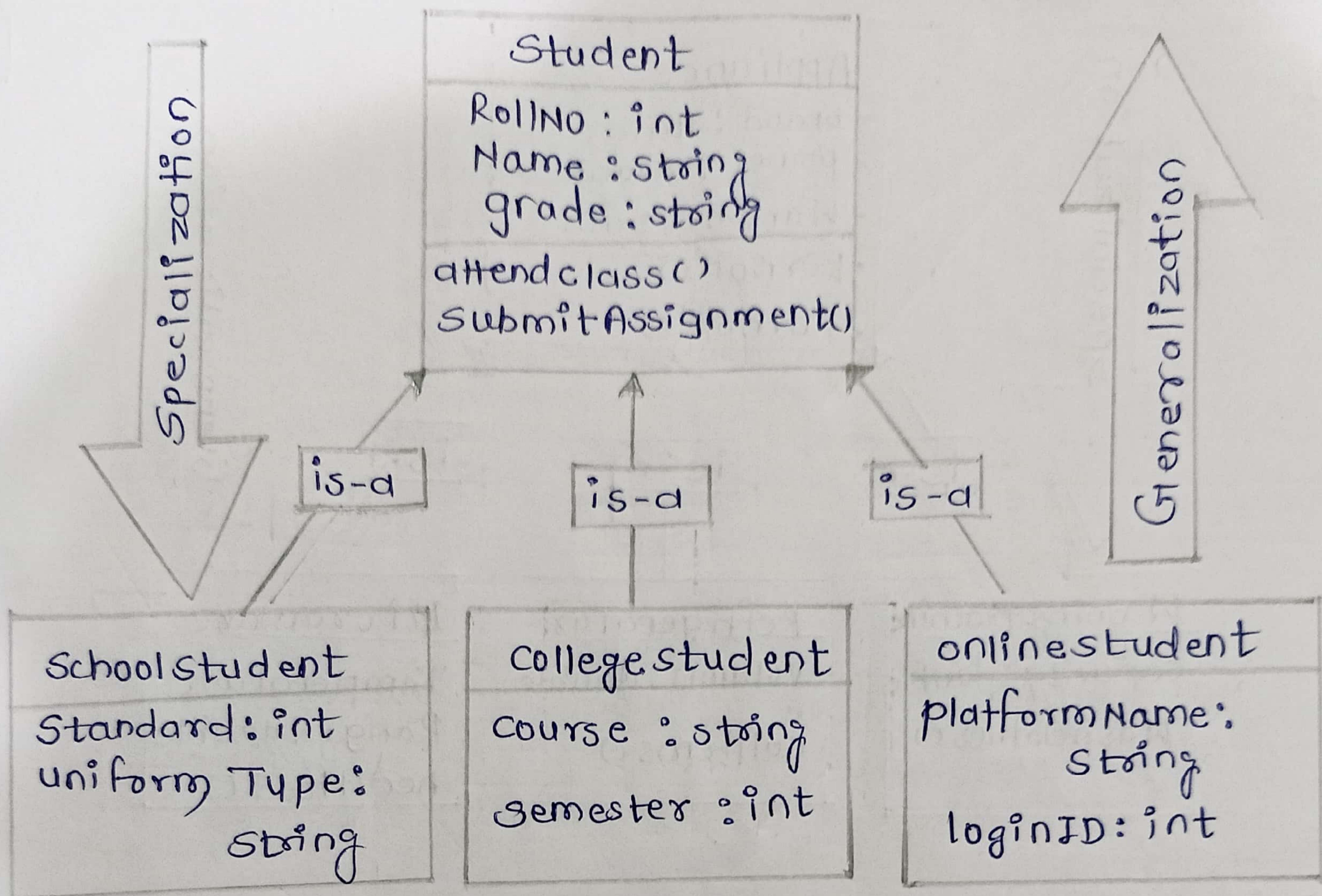
5]. Appliance



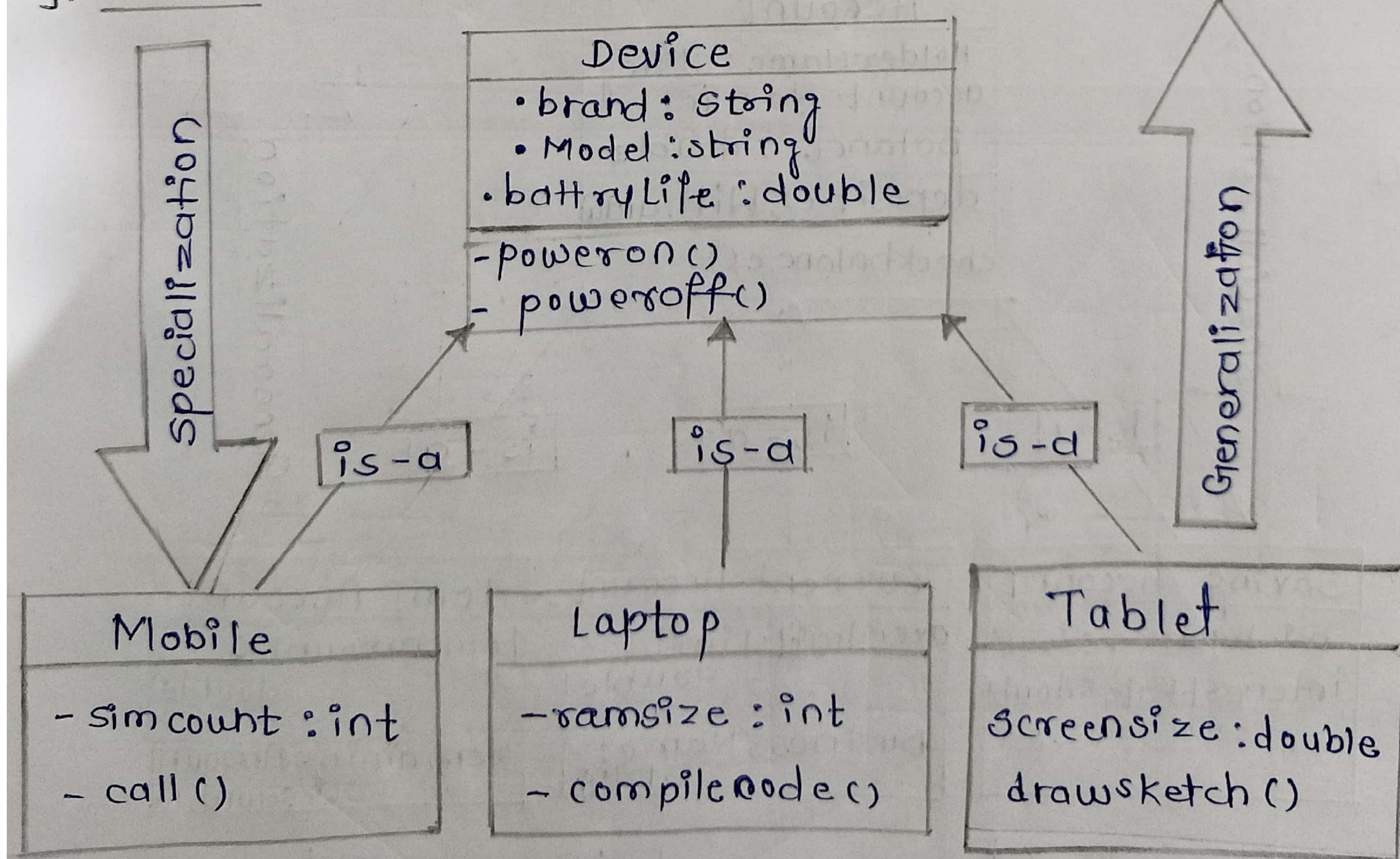
6]. Account



02/II/2023
7. Student

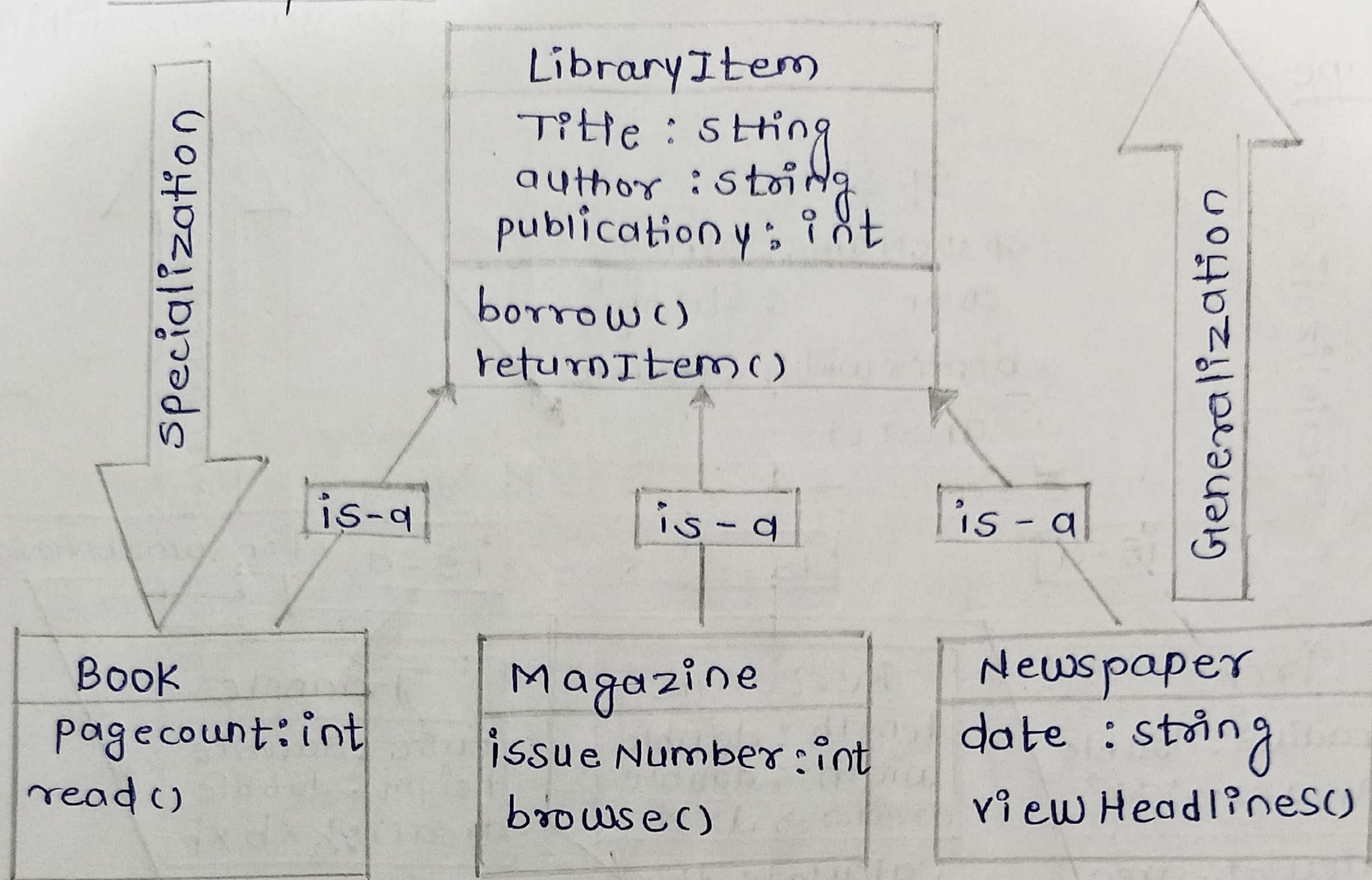


8]. Device

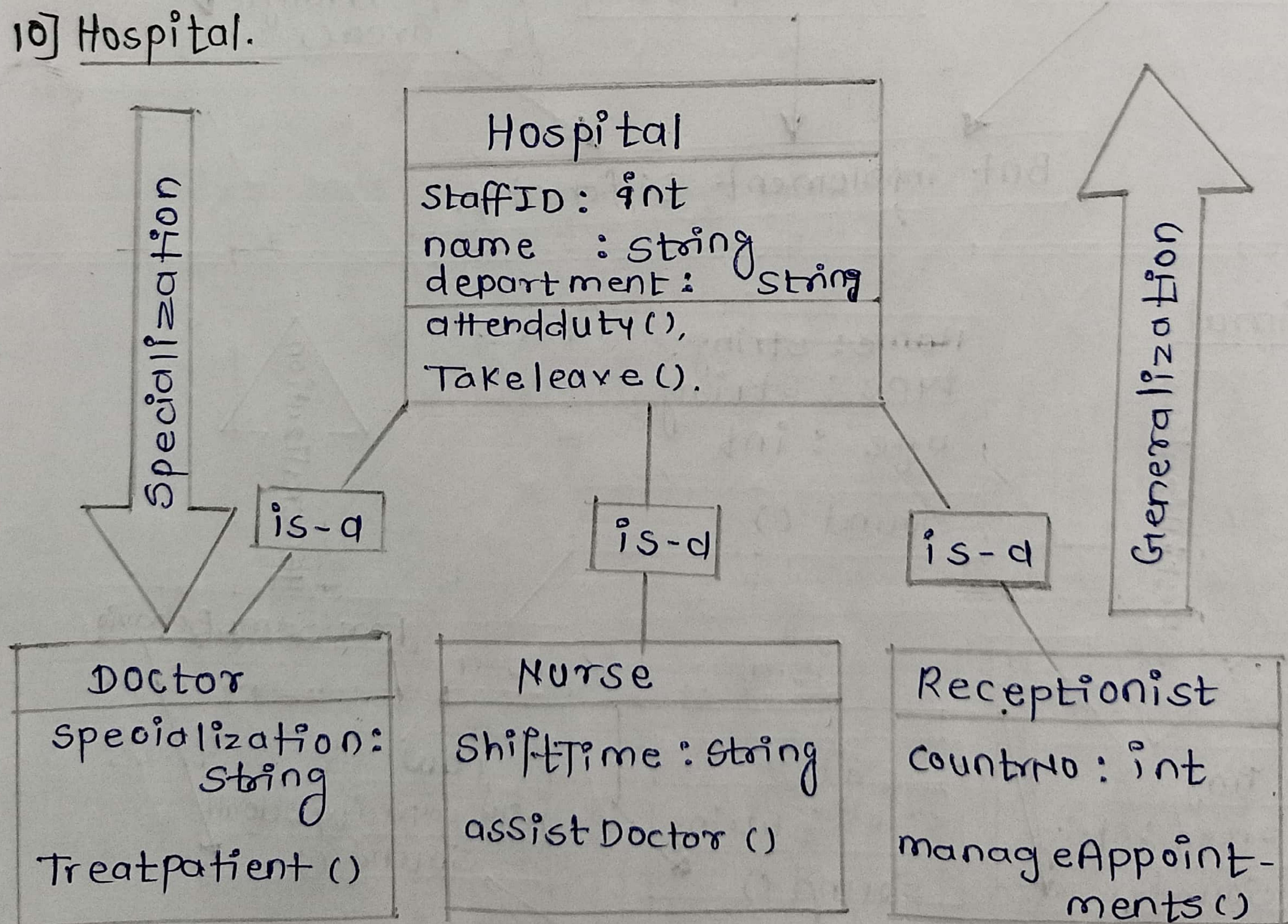


10
02/11/2025

Q5. LibraryItem



10] Hospital.

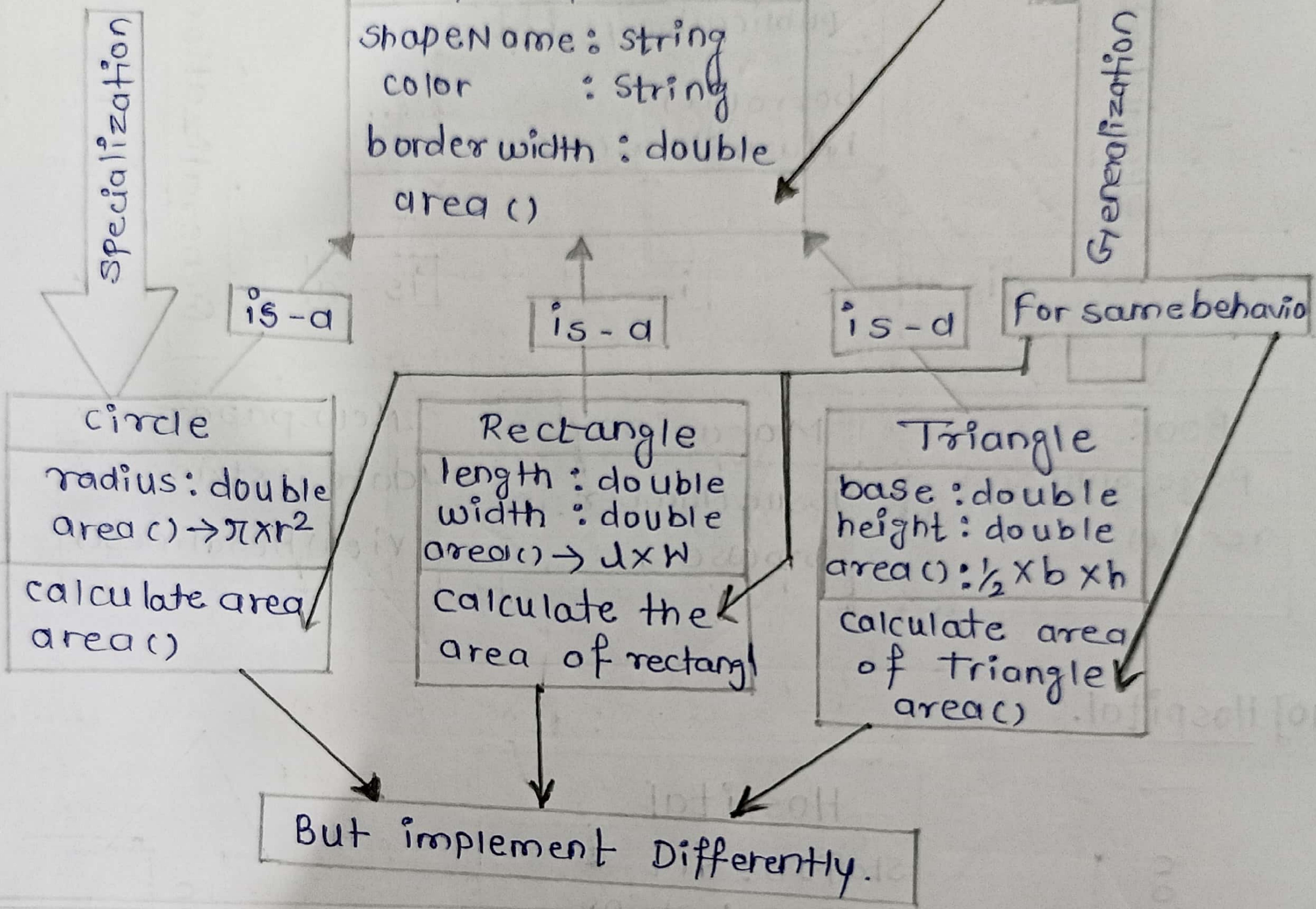


- Polymorphism:

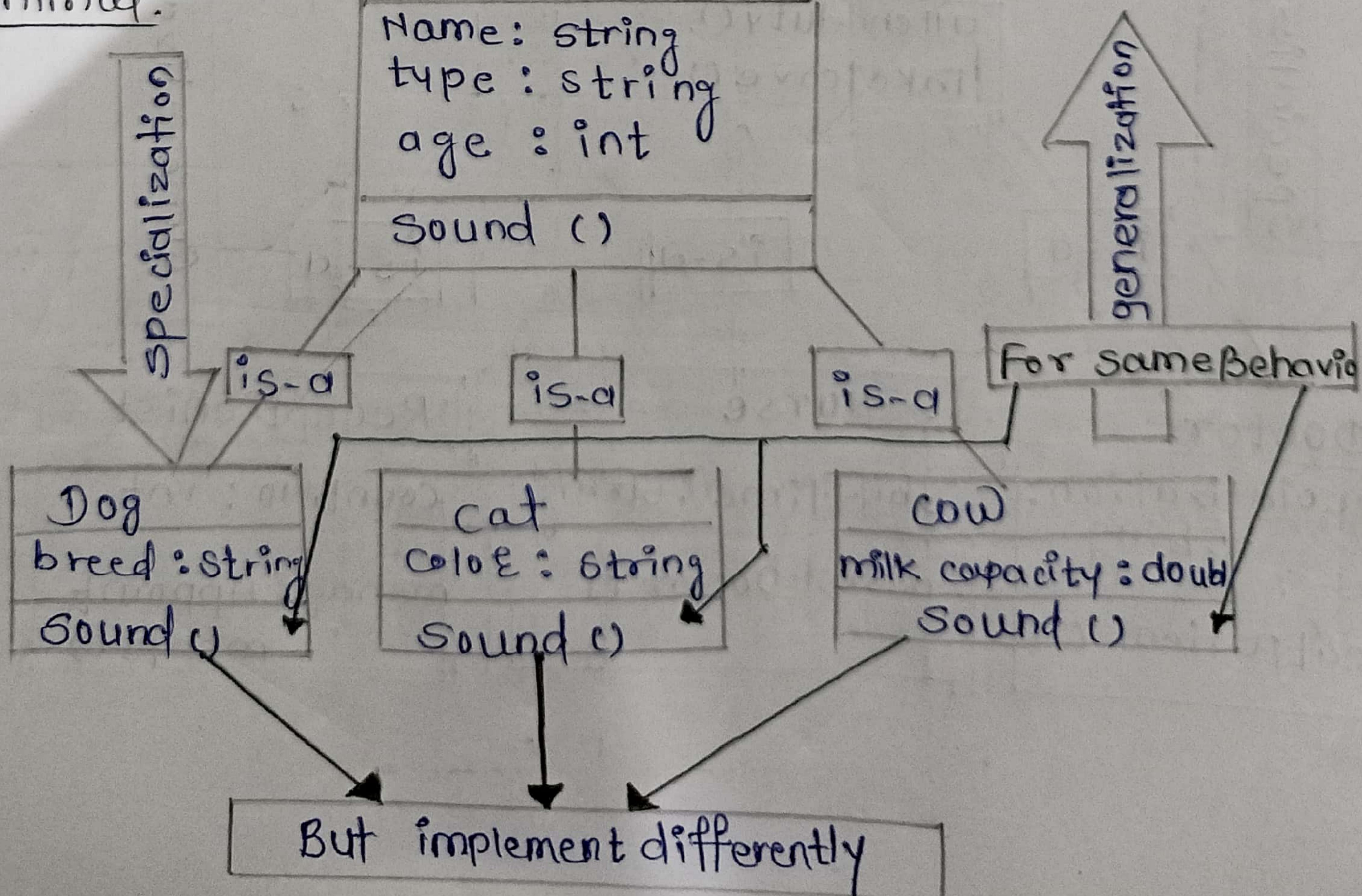
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.
- Message given to generalize things for same behavior but implement differently.

Example of polymorphism:-

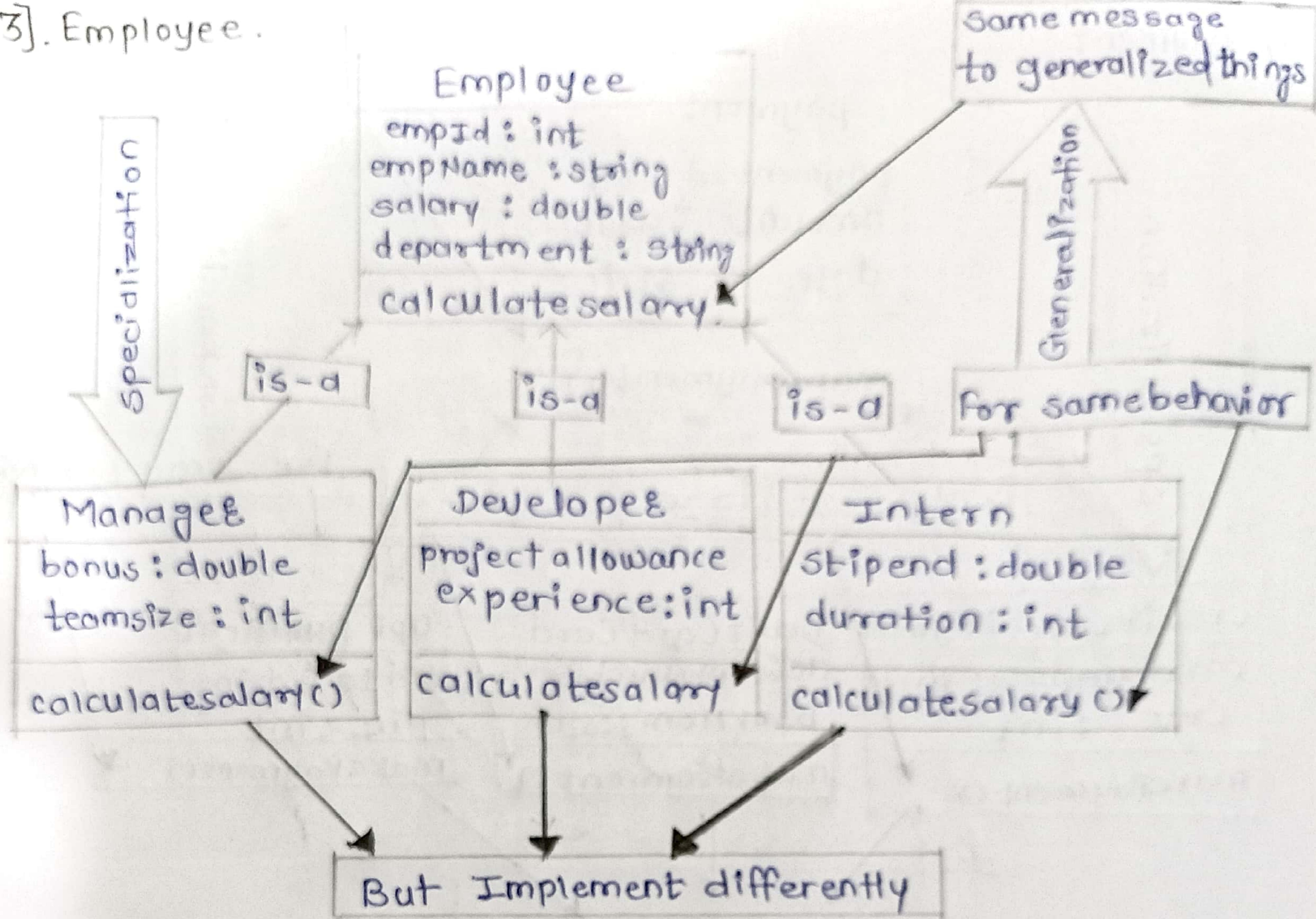
1]. Shape



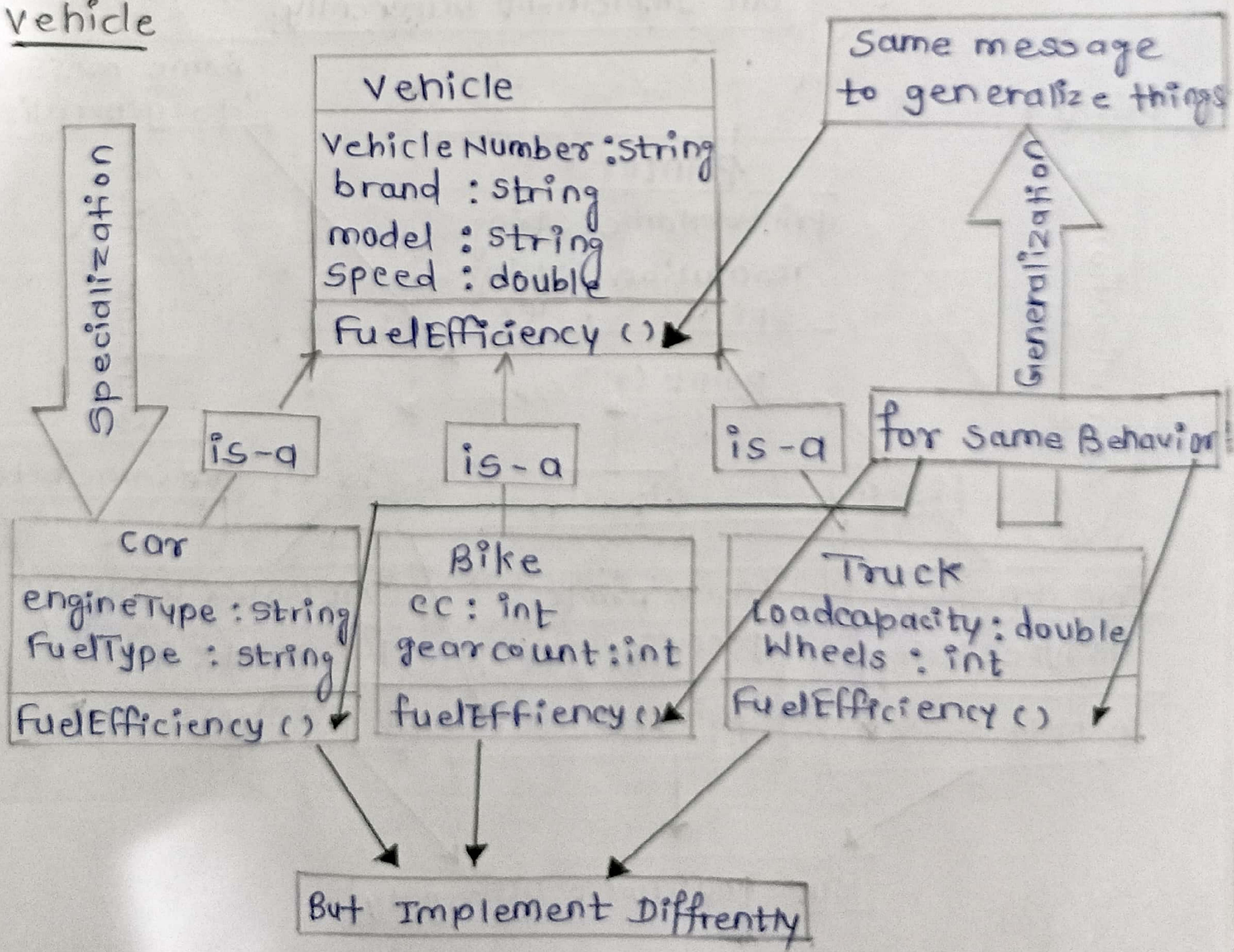
2]. Animal.



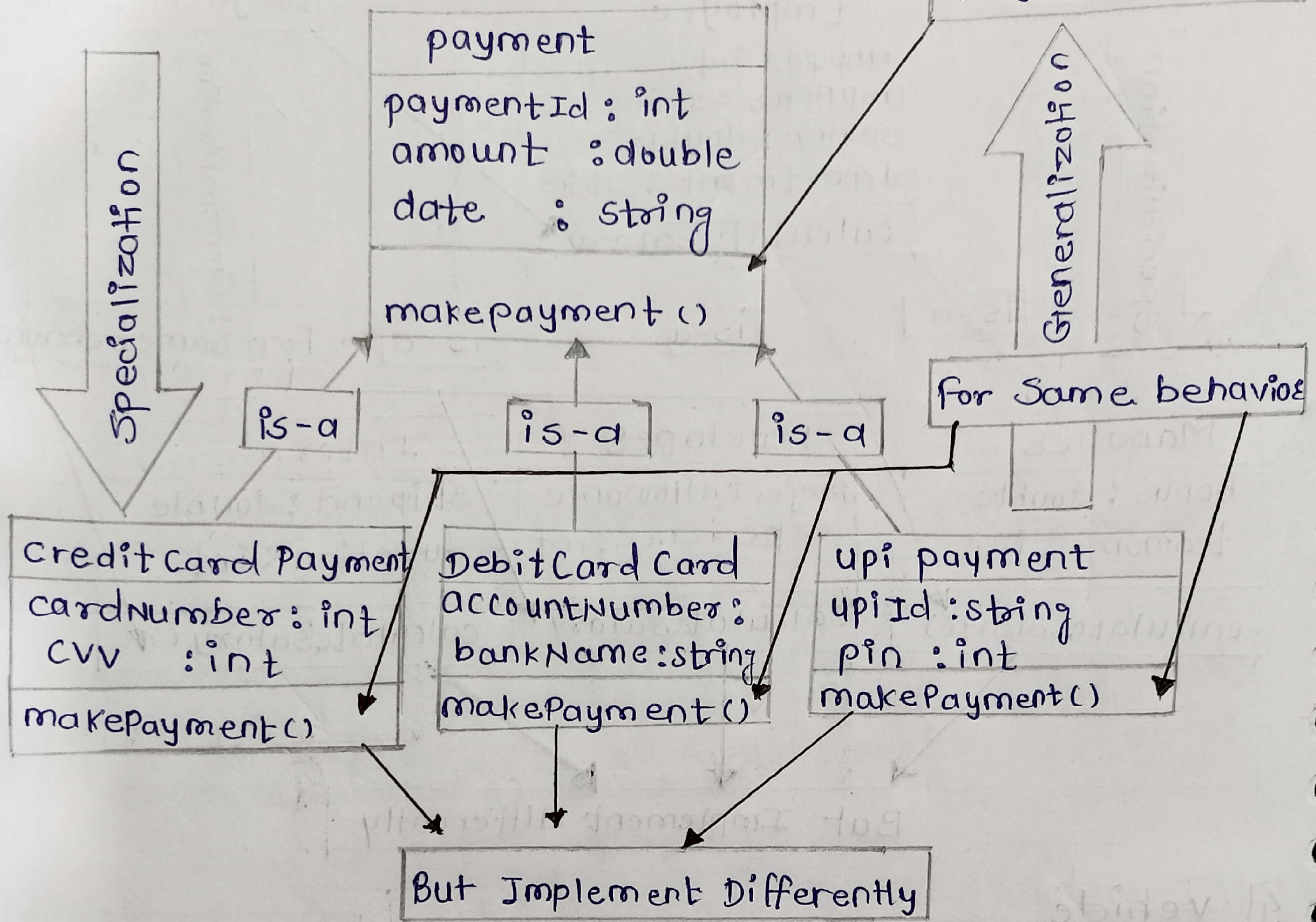
3]. Employee.



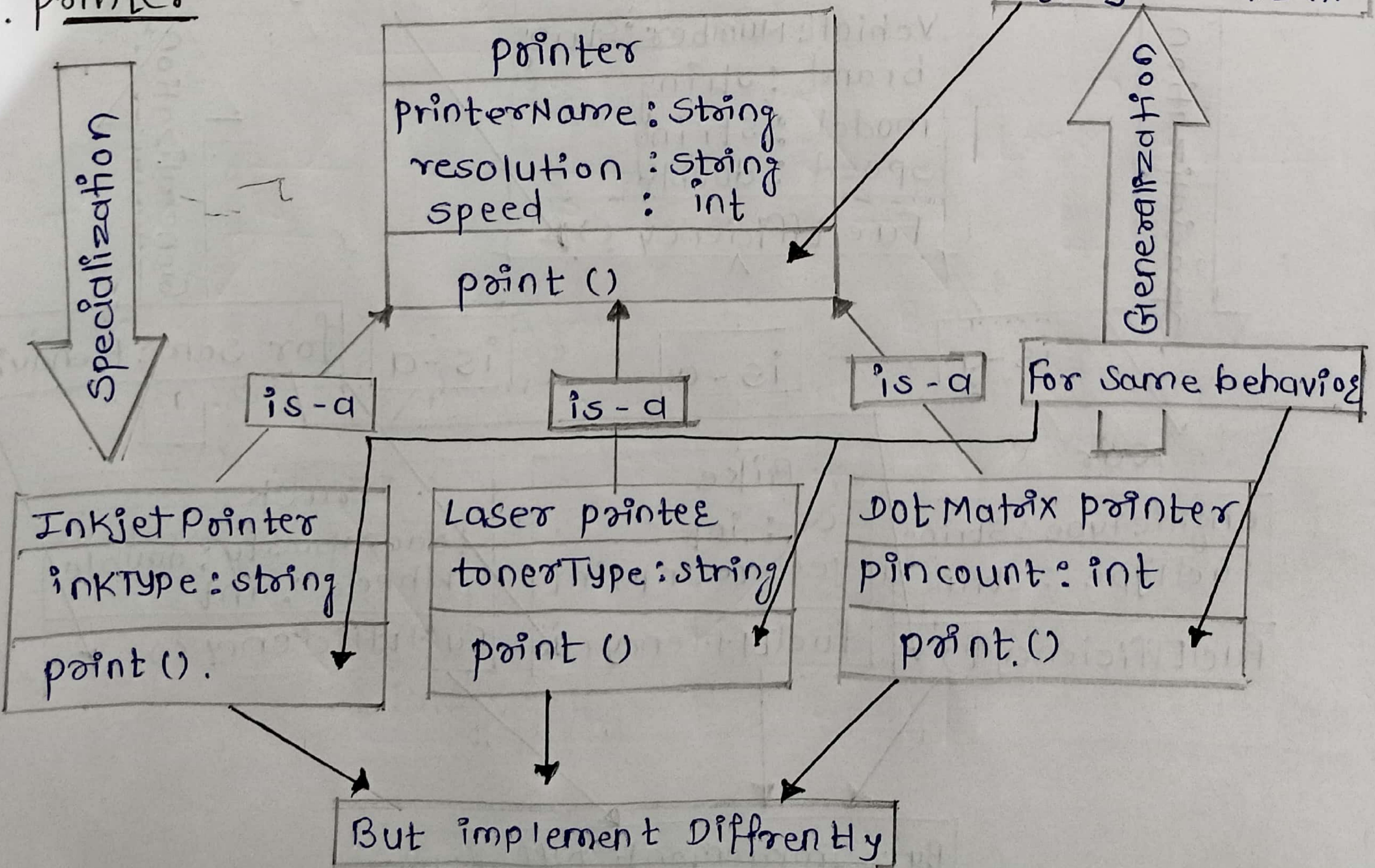
4]. Vehicle



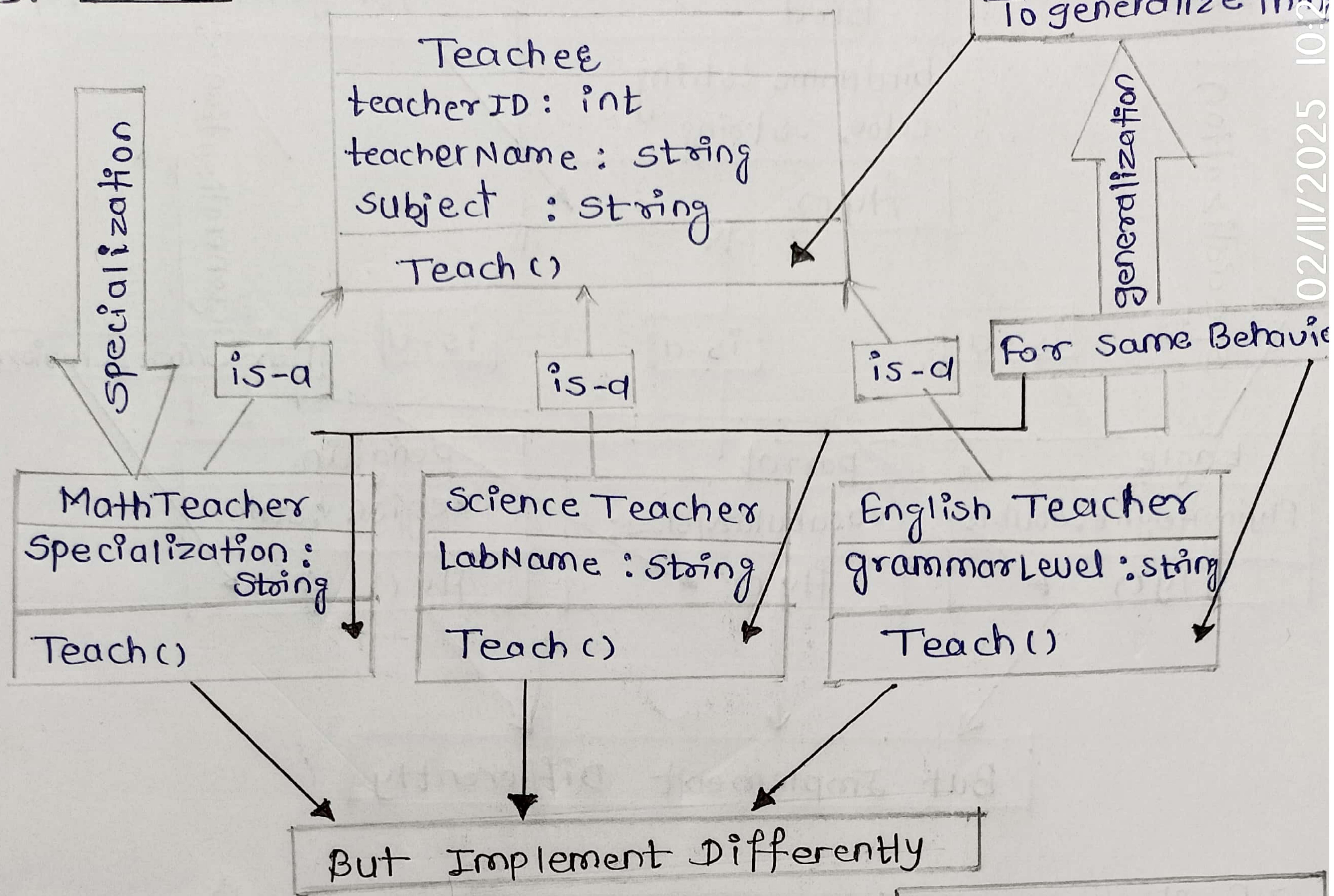
5]. payment



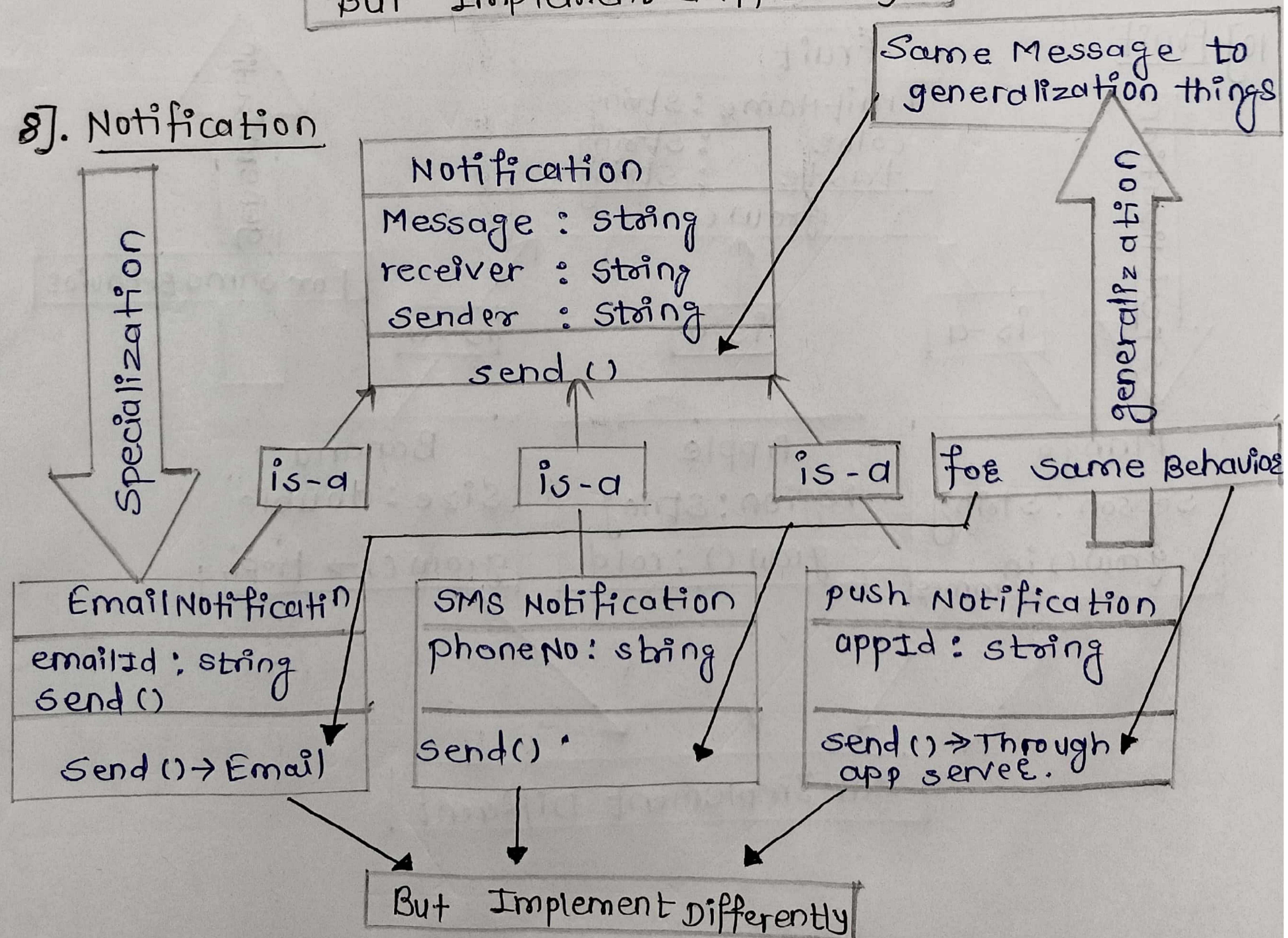
6]. pointer



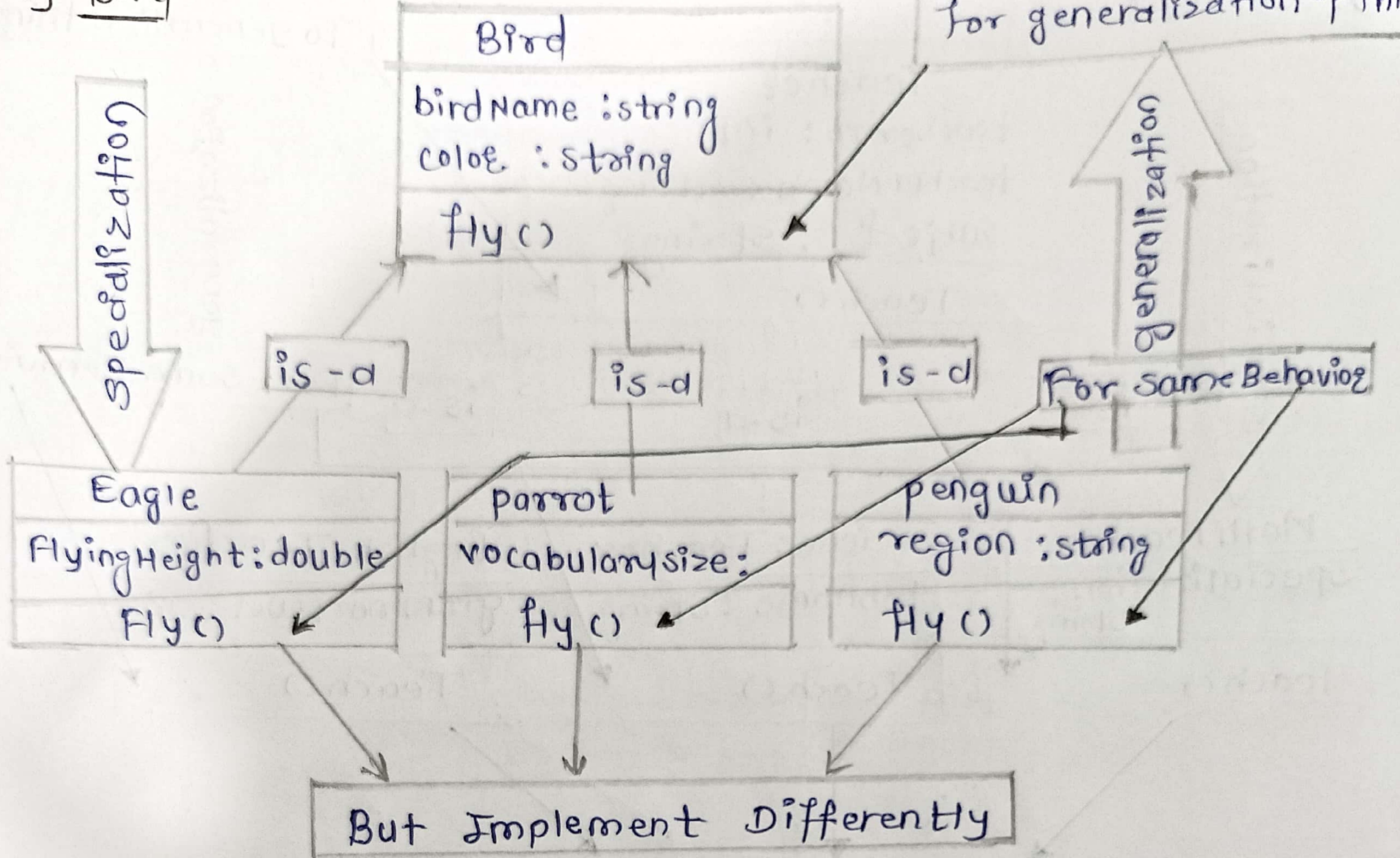
7]. Teacher



8]. Notification



g] Bird



10) Fruit

