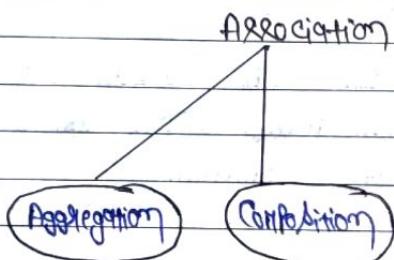


(3) = Explaining various types of association formed between classes
in class diagram & what are 'aggregation' & 'composition'
Qualified association? why they are defined? Give an example
of each association in class!

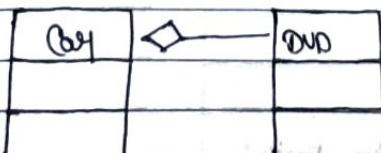
= Association is a structural relationship that represents how
two entities are linked or connected to each other with in
a system & can have three types of associations, such as
one-to-one, one-to-many, many-to-one and many-to-many

An Association can be categorized into four types of associations
i.e.; bi-directional, uni-directional, Aggregation, composition
and reflexive



Aggregation →

- Aggregation is a type of association
- It is typed to represent whole-part relationship.
- It normally refers has-a relationship.
- It denotes a strong —



Composition -

The composition is the directed aggregation.

That is when one object contains another objects and the contained object can not exist without the existence of the containing object, then it is called composition.

Represented by



Association class -

The Association class is a class that allows the association to be a class itself. This means association itself has attributes and operations.

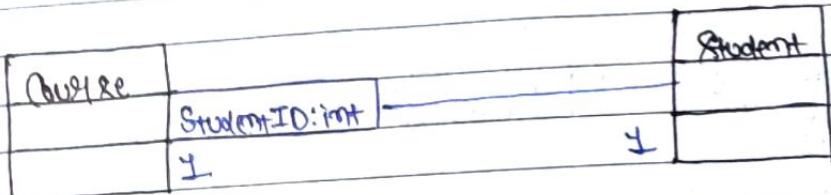
Student	+EnrollFor		Course
- Name	*	*	- CourseName
- StudID			- CourseID
- Address			- fee
+ Check_Eligibility()			+ Allocate_Role()
+ Select_Course()			+ Cancel_Allocation()
			+ Update_Course()

Enrollment
- Marks
+ Calculate_Avg_Marks()

Association class

Qualified Association -

The Qualified association has Qualifier which is used to select particular object from the set of objects.



Qualified Association

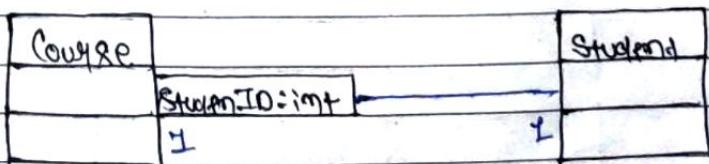
A Qualifier is a property which defines Selection Key.

Q = what do you understand by Qualified association? what are the advantages of their use? explain with suitable example

= The Qualified association has Qualifier which is used to select particular object from the set of objects for example - for selection of particular student from the course the Qualifier will be StudentID.

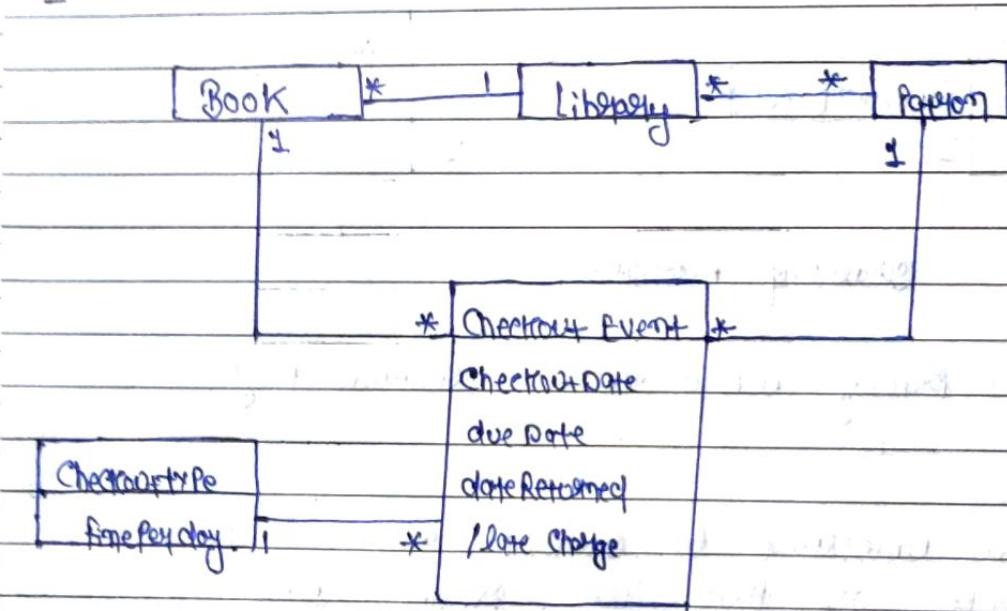
A Qualifier is a property which defines Selection Key. UML allows having a Qualifier on each end of a single association.

The multiplicity can be associated with the association link.



② = Prepare a portion of an object diagram stay the part of library checkout system that allows the date a book is due and the late charges for an overdue book and derived objects.

=



$$\{ \text{lateCharge} = (\text{dateReturned} - \text{due date}) * \text{ChecoutType.finePerDay} \}$$

- (5) - Differentiate between 'aggregation' and 'generalization' in Object Model. Using a suitable example, can both 'Relationships' exist in a class diagram? If yes, give an example of this pattern with suitable advantage.

→

Aggregation

An Association between two objects which describes the 'has a' relationship

Denotes "has a" relationship

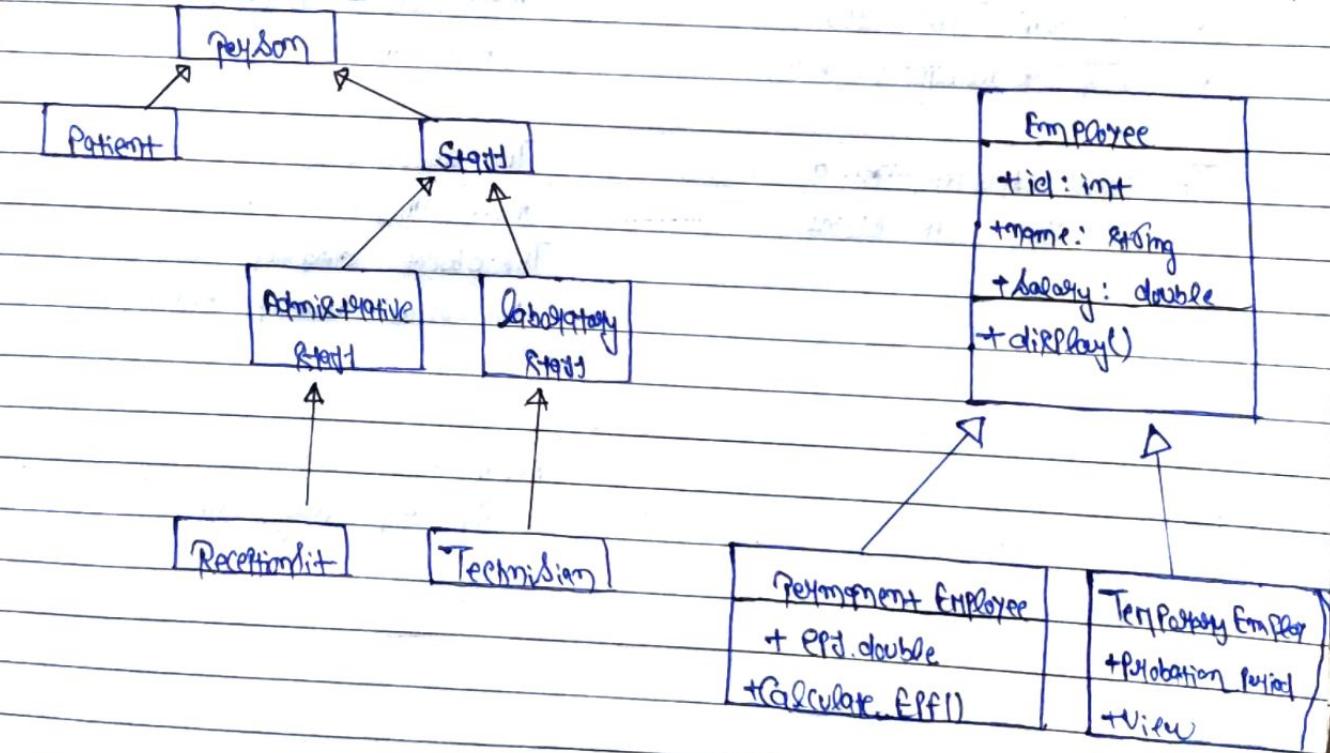
A diamond symbol
appended on aggregation

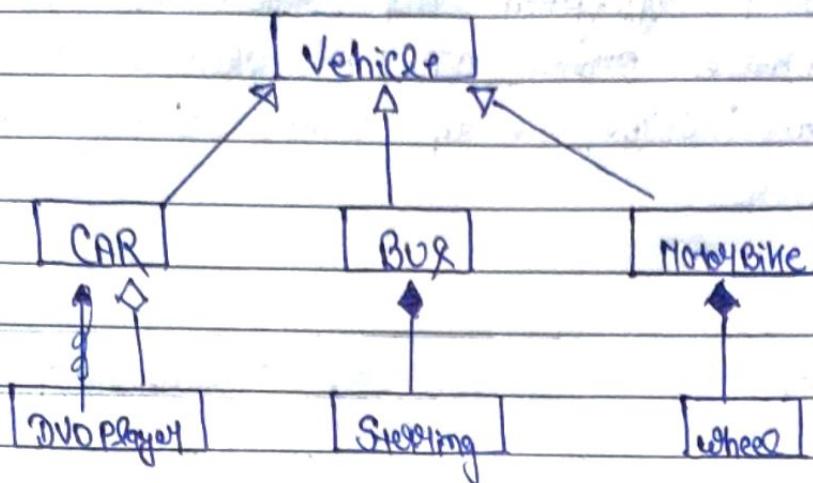
Generalization

A mechanism for combining similar classes of objects into a single general class

Denotes "is a" relationship

An arrow symbol
appended on generalization





Q=6 Difference between class diagram and object diagram?

⇒

Class Diagram

In class diagram, each class is collection of data and function. Their functions are used to manipulate data.

Object Diagram

An object is basically an instance of a class. Hence object diagram is a collection of objects.

The class diagram act as a tool for the object

The object diagram is created from the class diagram. The object diagram represent the real world entities.

A single class can create multiple objects

Every object is created one and only one class.

Example -

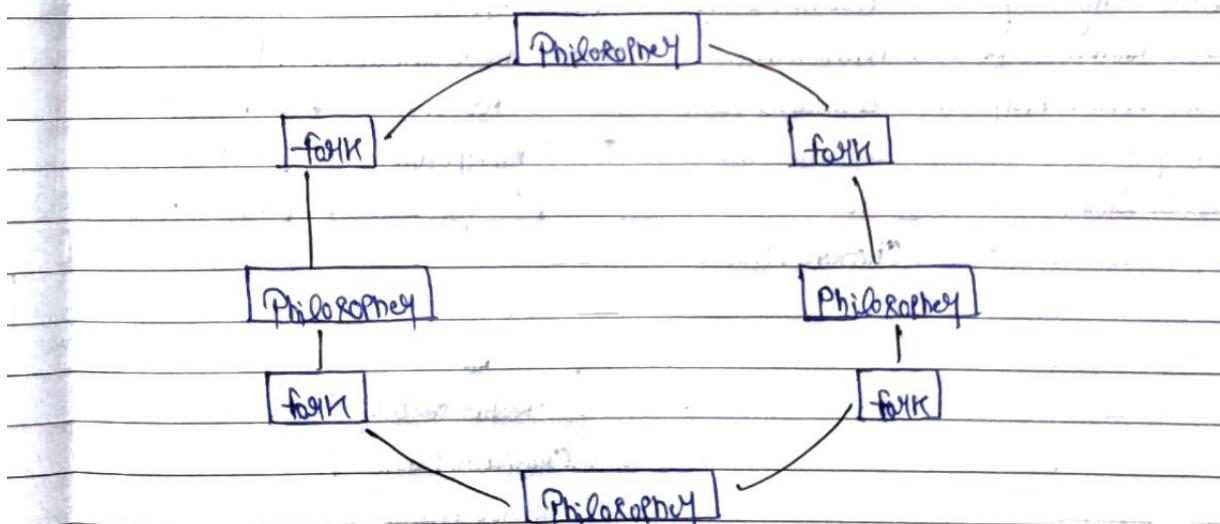
Class Vehicle in vehicle automation system

Object - Aro, Zfit, Sonnia etc.

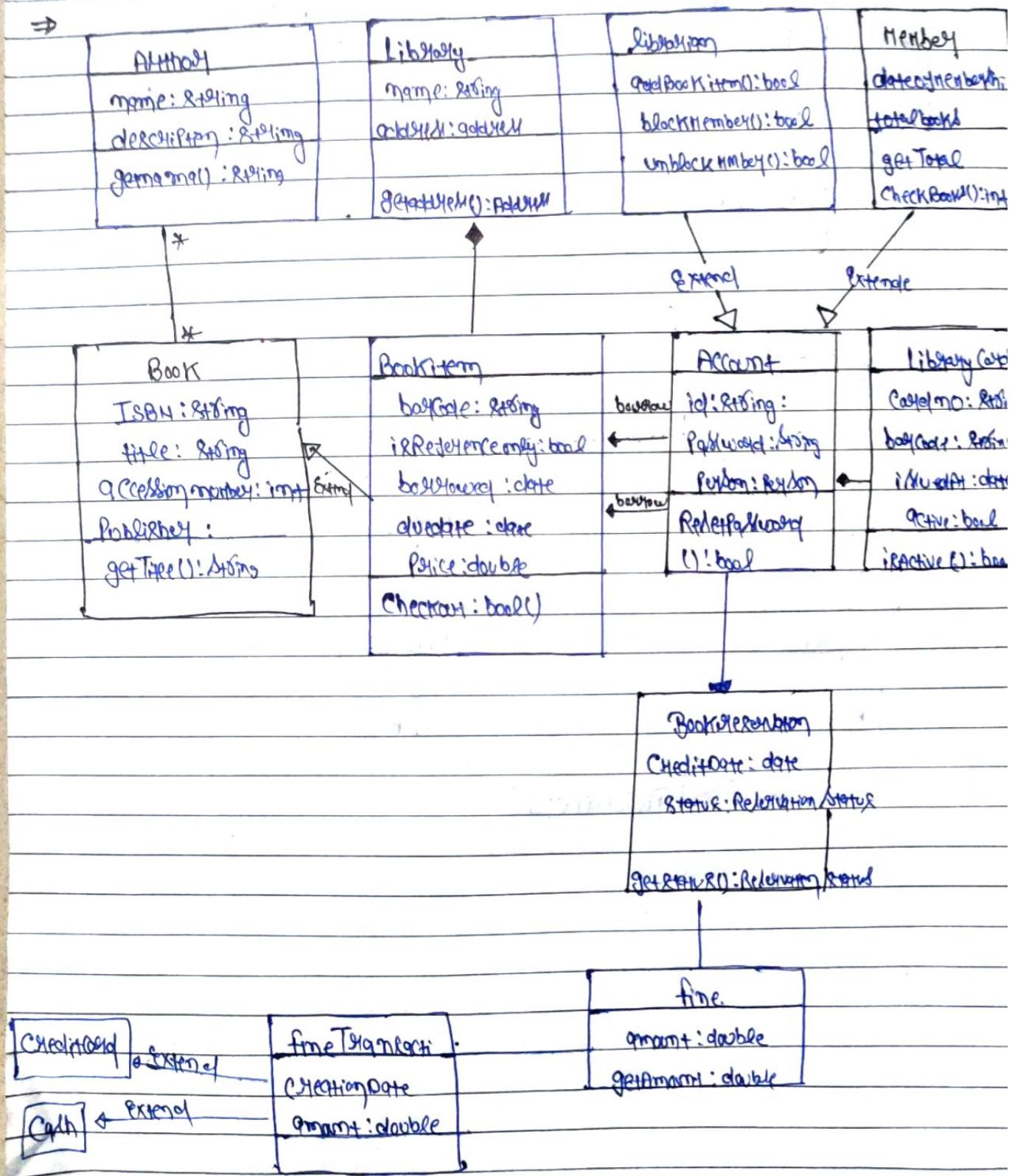
Class diagram for Philosopher Problem —

	Philosopher		
left	- eating : Boolean - hungry : Boolean	leftPh	fork
	hungry : Boolean		busy : Boolean
	becomeHungry()		UP()
	forkUp()	rightPh	down()
	forkDown()	rightf	
Right			

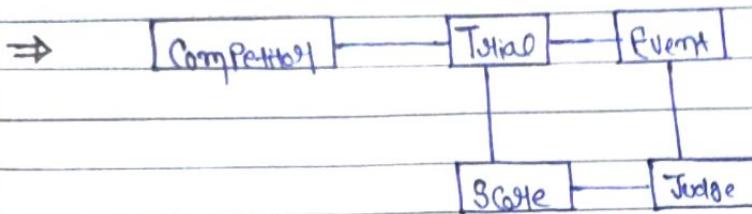
Object diagram —



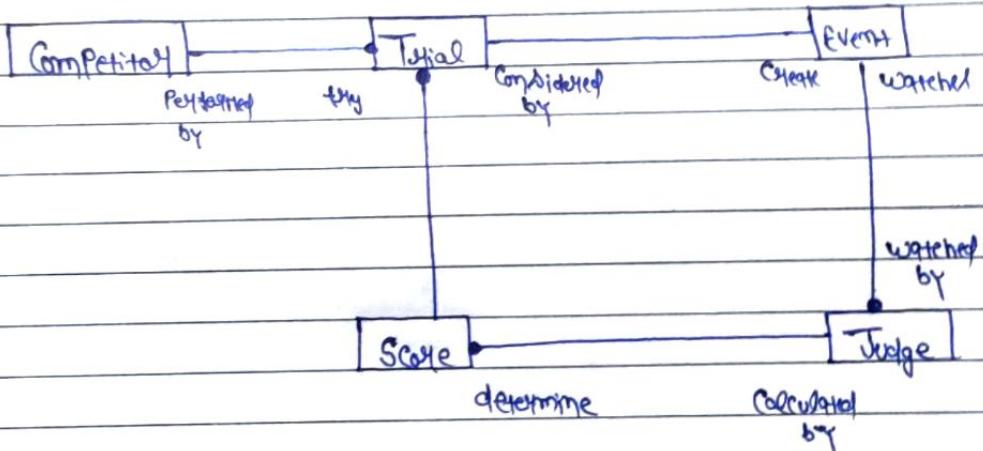
⑧ - Draw a class diagram summarizing the following facts about library. ~~circumlocution~~ design specification ---



⑦ -



Answer -



OOS Assignment No 2

- 1) Explain the concept of activity, action, guarded transitions
automatic transition in state diagram using suitable example.

⇒ Activity -

Activity is grouping of actions.

Action -

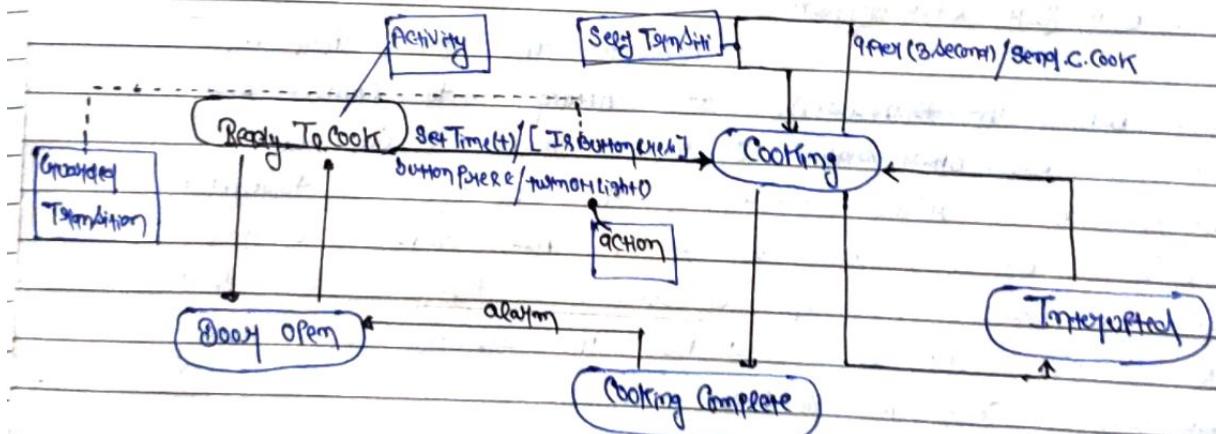
The executable and atomic (computations) are called as actions.

Guarded Transition -

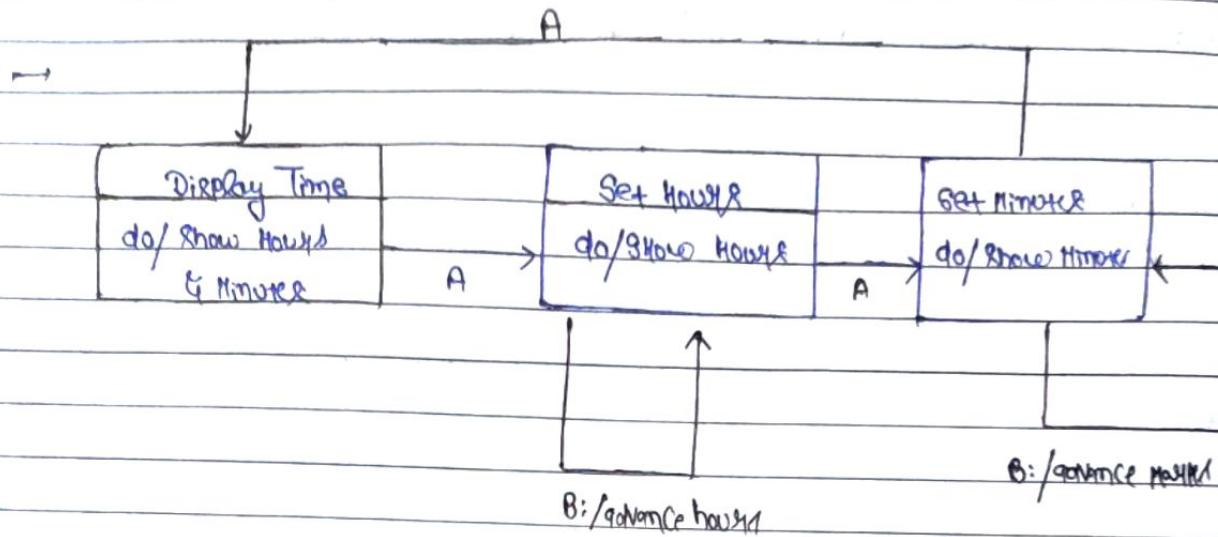
It is a boolean expression which is placed inside the square bracket. It is condition which is valid for time or interval.

Automatic Transition -

Automatic transition are the events that are handled internally without leaving the state.



② → what are the advantage of merged state diagram.
 Only glott state diagrams? probably static diagram for digital electronic watch.

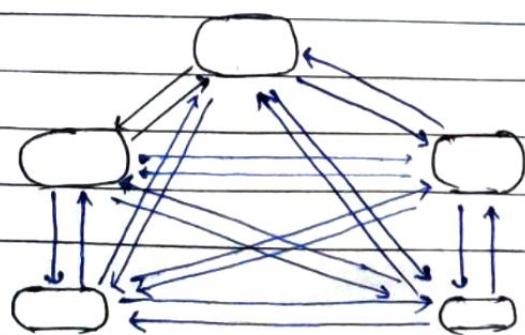


Advantage —

* A merged state diagram is used to model the complex system as the regular state diagram is inadequate in describing the larger and complex problems.

Problem with glott state diagram —

Consider the given diagram in which n^2 transitions are needed to connect every state to every other state. If this model can be reformulated using structure, the no of transition could be reduce at low of n . All complex system contain a large amount of redundancy that can be used to simplify state diagram. At here the advantage of merged state diagram comes into the picture.



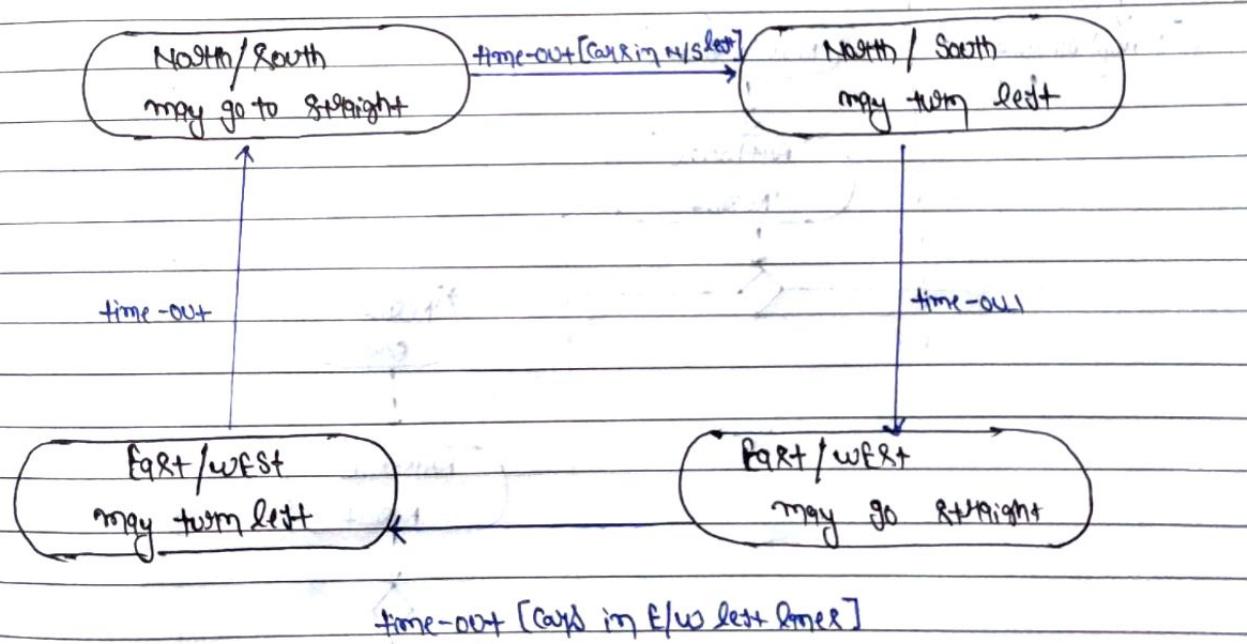
③ What are guarded transitions in state diagram? How they are implemented? Explain their suitability with an example.

- A Condition is Boolean testing of object values, such as "the temperature is below freezing". A condition is valid over an interval of time.

Condition can be used as guard on transition. A guarded transition fires when its event occurs, but only if the guard condition is true.

Ex - when you go east in the morning (event), if the temperature is below freezing (condition), then put on your gloves (next state).

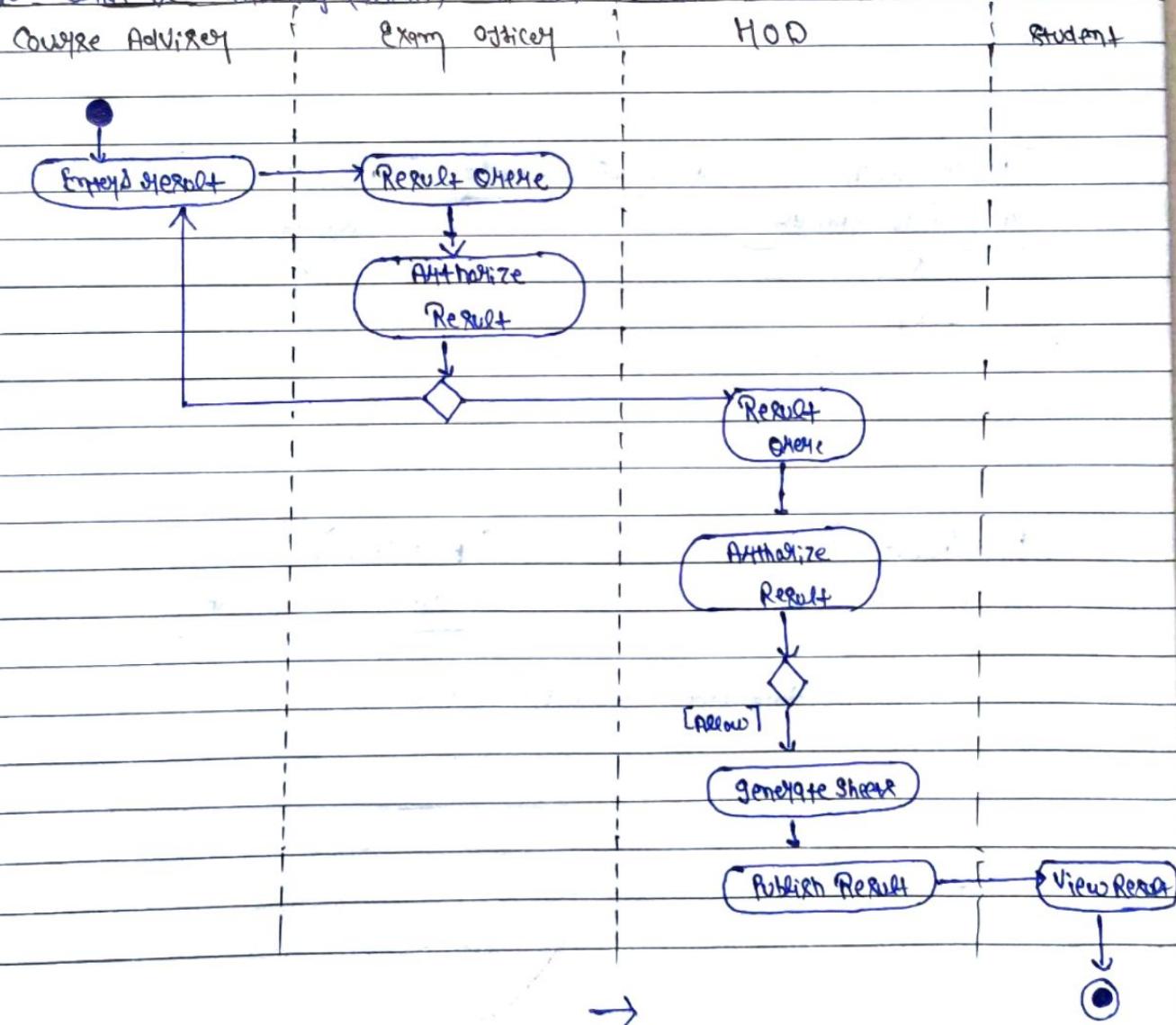
A guard condition on a transition is shown as a Boolean expression in brackets.



④ - Differentiate between activity diagram and flowchart - Prepare
an activity diagram for the result management
system of a university.

⇒ An activity diagram is a graphical representation of workflow
of stepwise activities and action with support for choice,
iteration, and concurrency. In contrast, a flowchart
is a diagrammatic representation that illustrates a solution
model to a given problem. Thus, this is the main difference
between activity diagram and flowchart.

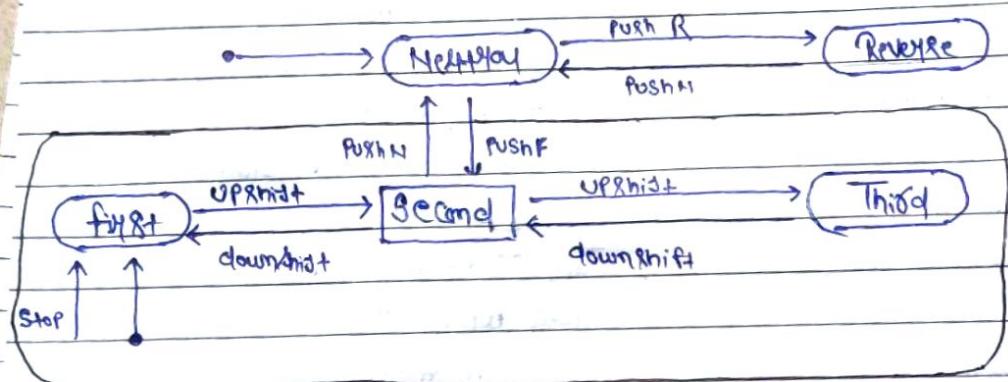
In the end we can say flowchart just give us idea how
we can model, with step by step view, but Activity diagram tell
us what is happening (activity) at each step.



⑤ - Differentiate between State generalization and State aggregation in State diagram with the help of example.

→ State generalization -

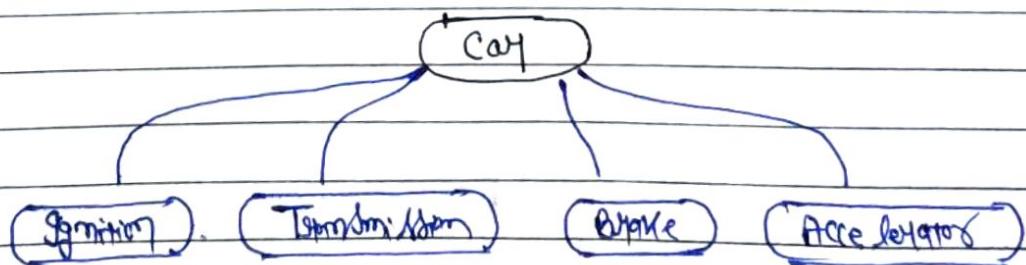
States may have substates that inherit the transitions of their superstate, just as classes have subclasses that inherit the attribute and operations of their superclass. Any transition or action that applied to a state applies to all its substates, unless overriden by an equivalent transition on the substate.



State diagram may say transmission with generalization

State Aggregation -

State Aggregation is just like simple aggregation which is type of association. In State Aggregation the hub state has a 'part-whole' relationship, means the sub state and main state both have their own state function and activity but main state contains substate of a part.



⑥ - Complete and Complete New Event trace diagram
and Collaborating diagram used to realize the Cash Deposit
Event trace diagram and Collaborating diagram for withdrawal
of an account amount from BANK ATM Machine

- Event trace diagram also known as Sequence diagram.

Sequence Diagram

The Sequence diagram represents the UML, which is used to visualize the sequence of events in a system that is used to perform specific functionality in UML - Case.

The Sequence diagram is used when time sequence is main focus

The Sequence diagram are better suited of showing a sequence of activities

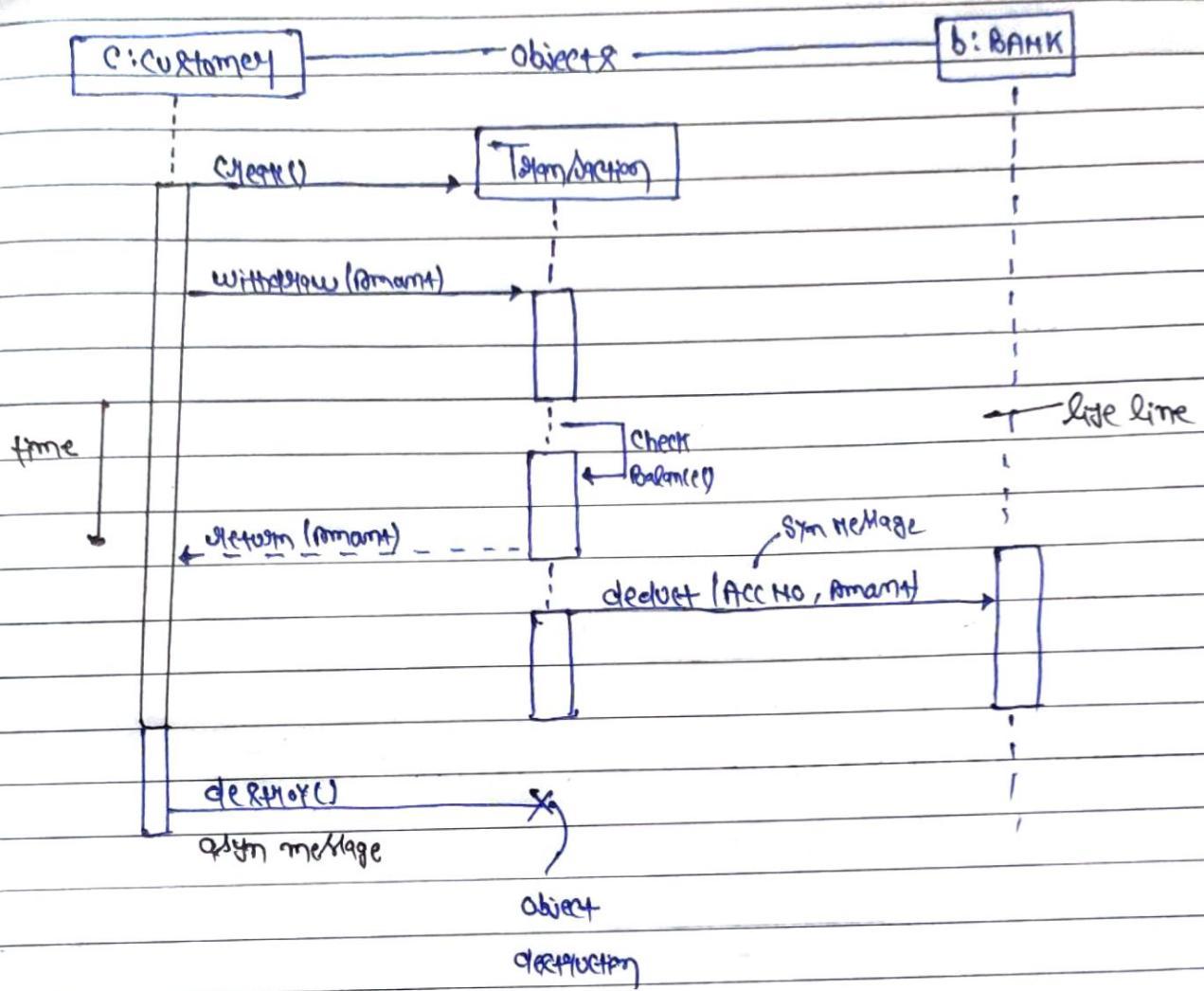
Collaboration Diagram

The Collaboration diagram are used to represent the structural organization of the system and the messages that are sent and received.

The Collaboration diagram is used when object organization is main focus.

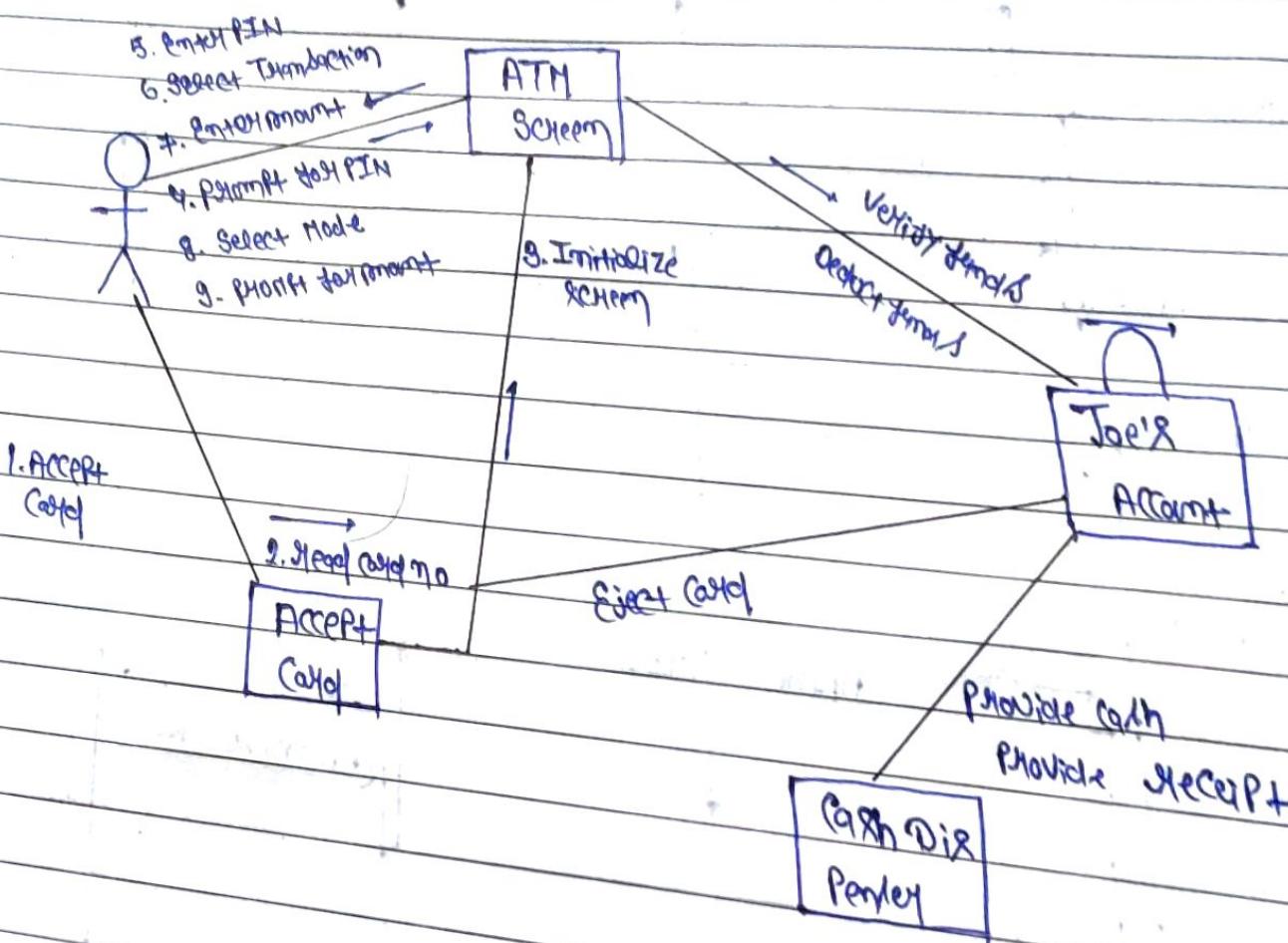
The Collaboration diagram are better suited for depicting simple interactions of the objects.

Event - trace diagram for ATM

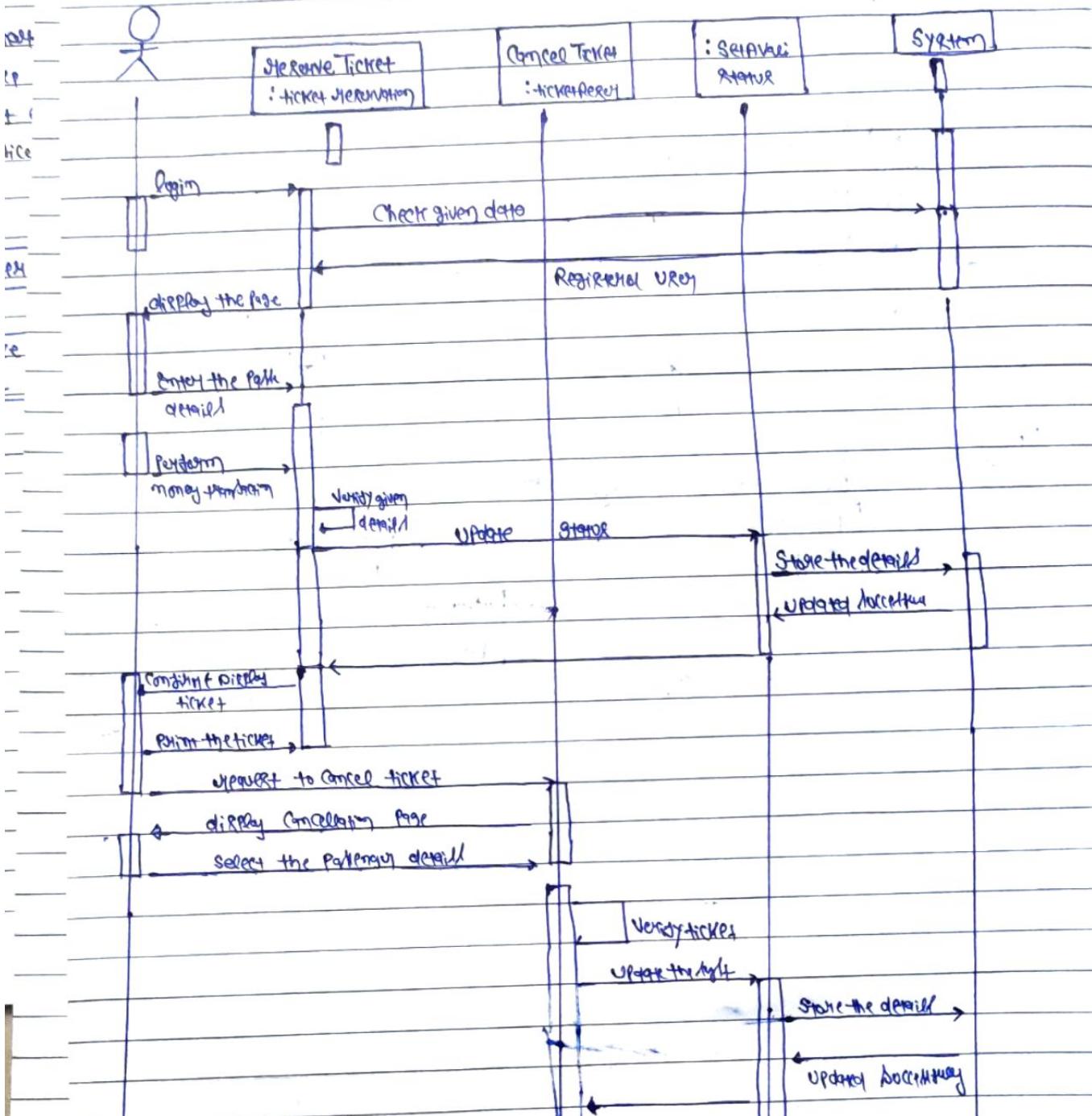


Sequence diagram for ATM

Collaboration Diagram

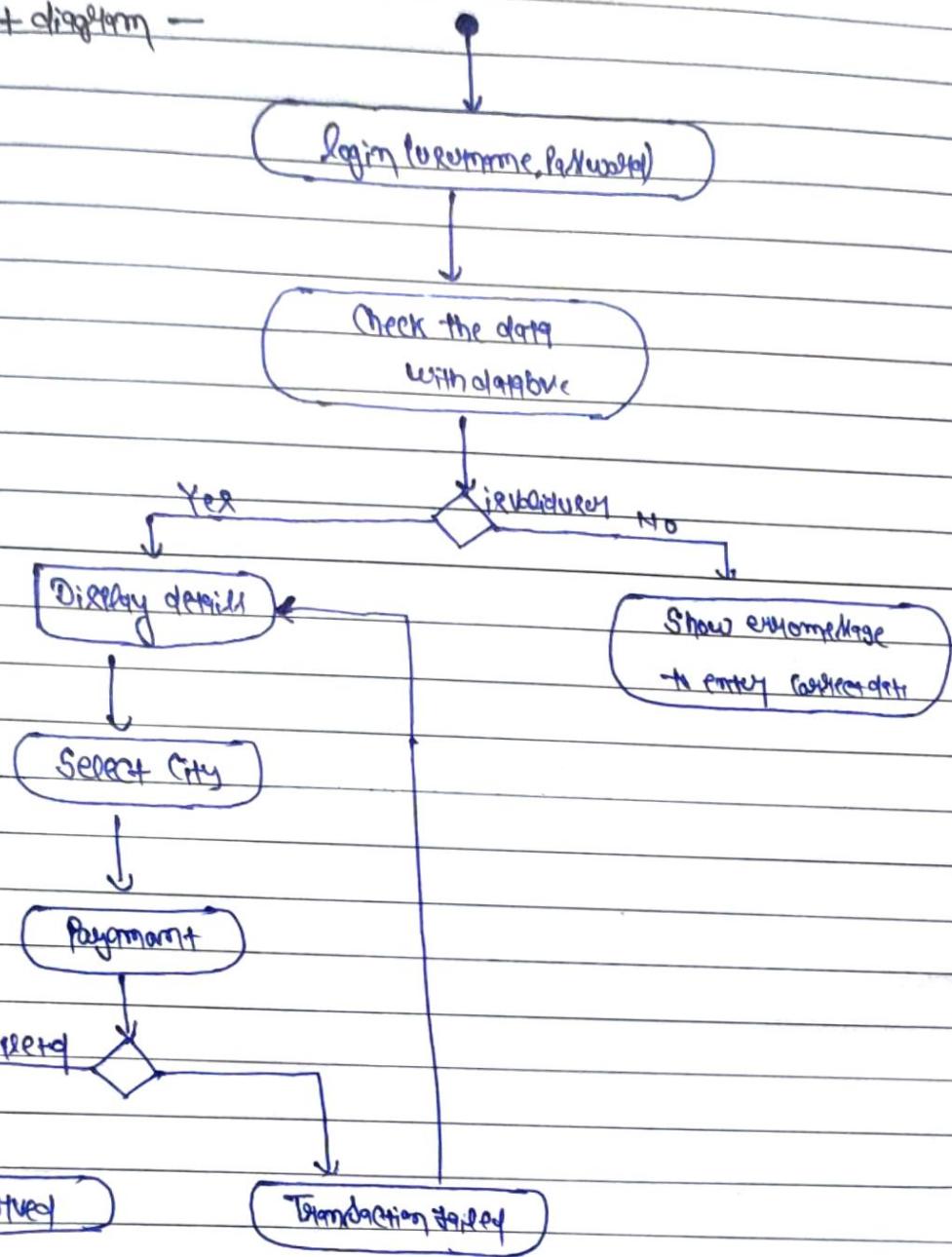


⑦ - Share a labeled Sequence diagram and an e-ticket evidence from the Railway website.



Labeled Sequence diagram

State chart diagram -



State diagram.