

Unit - 3

* Requirement Analysis.

- Requirements are the features of a system or description of something, The system is capable of doing in order to fulfill the system purpose.
- Requirement engineering is a understanding of requirement + and documentary of system requirement.
- In the requirement analysis written in natural language containing a description of what system will do without describing how it will do.
- One large document containing a description of what system will do without describing how it will do.
- Input to Req. engg. is to use extn. existing version and develop new version adding with additional description. It is important because developer refers it to check its correctness of system and use of validation at the end of the system development.

* Requirement Engineering Tasks.

- 1) Inception
- 2) Elicitation
- 3) Elaboration
- 4) Negotiation.
- 5) Specification
- 6) Validation.
- 7) Requirement Management.

I) Inception - This is first phase of diag. analysis process. This phase gives an outline of how to get started on a project. The following criteria have to be addressed by soft. engineers:-

- I) Understanding of problem
- II) The people who want solution.
- III) Nature of the sol.
- IV) Comm. btw customer & developer

II) Elicitation - This phase focus on gathering requirements from stake holders. In this phase requirements are identified with the help of customer. The problems can occur in this phase are :-

I) Problem of scope - The requirements given are of unnecessary detail, incomplete defined or not possible to implement.

II) Problem of understanding - Not having a clear cut understanding btw developer and customer when putting out the reqs. needed.

III) Problem of volatility - Requirements changing overtime. can cause difficulty in leading a project.

3) Elaboration - This phase is the result of the inception and elicitation phase. In the Elaboration process, it takes the requirements that have been gathered in the first two phases are refined and prototype is developed.

4) Negotiation - The following discussion in the negotiation phase are :-

- 1) Availability of resources
- 2) Delivery time
- 3) project cost
- 4) estimations of the development

5) Specification - This is 5th phase of reqd. Analysis process. It specifies the following.

- 1) written document
- 2) set of Model
- 3) A collection of use cases
- 4) A prototype.

6) Validation - This phase focus on checking for errors and debugging. In the validation phase, the developer scan the specification document and checks :- 1) all the requirements have been stated and met correctly. 2) errors have been debugged and corrected. 3) work product is built according to standard.

7) Requirement management - It is set of activities where the entire team

takes part in identifying, controlling, tracking and establishing requirements for the successful and smooth implementation of the project.

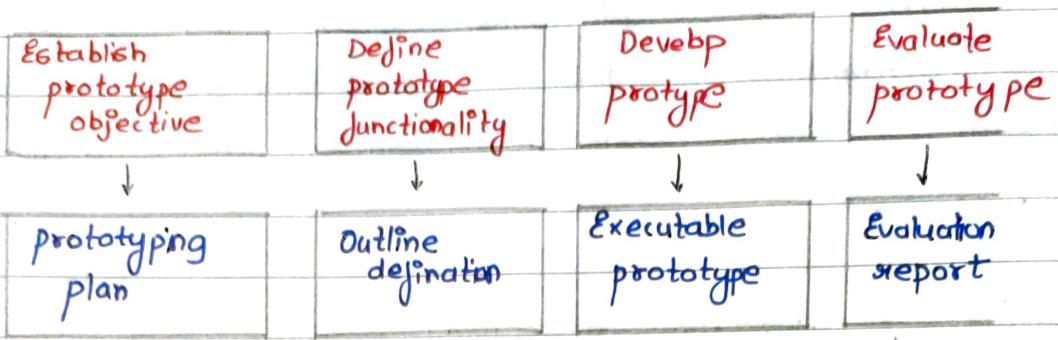
5 Prototyping / Software prototyping.

A software prototyping is a rapid development of a system software / system.

- why we use prototyping?
- 1) To reduce cost and to improve quality of final product
- 2) useful for risk assessment and as a useful for validation and to user.
- 3) The principle use is to help customers & developed understand the requirement of system.

→ Phases of prototyping.

- 1) Prototyping plan - To gain further specification requirement from customer.
- 2) Outline definition - This stage focuses in determining the level of functionality of the prototyping and documenting desire.
- 3) Executable prototyping - This stage is the development of prototype to construct prototype quickly we use visual basic prototype too.
- 4) Evaluation report - At this point feedback will be gathered from both the management and customers.



→ Types of s/w. prototyping

- 1) RAPID / Throughaway
- 2) Evolutionary
- 3) Increment Prototype.

* Data Dictionary

- A structured place to keep details of the contents of data stored in database.
- It is a structured depository of data about data.
- The advantages of Data dictionary.

1) Documentation - It is a valuable reference in any organisation.

2) It is important step in building database

3) Improve user communication.

4)

→ • Items to be defined in Data Dictionary.

1) Name

2) Range

3) Alias

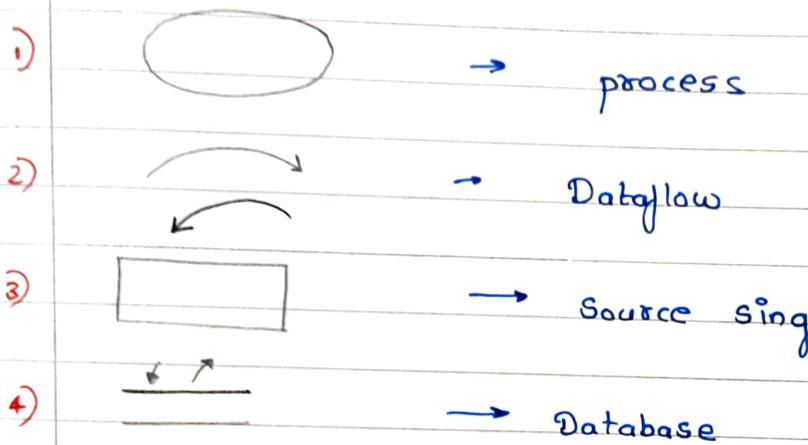
4) Relation b/w data types.

5) Type

classmate

3) Data Flow diagram (DFDs)

- A DFD shows the flow of data through the system and is also used for modelling req.
- It is also known as Bubble chart / Data flow graph.
- Symbols used in DFDs.

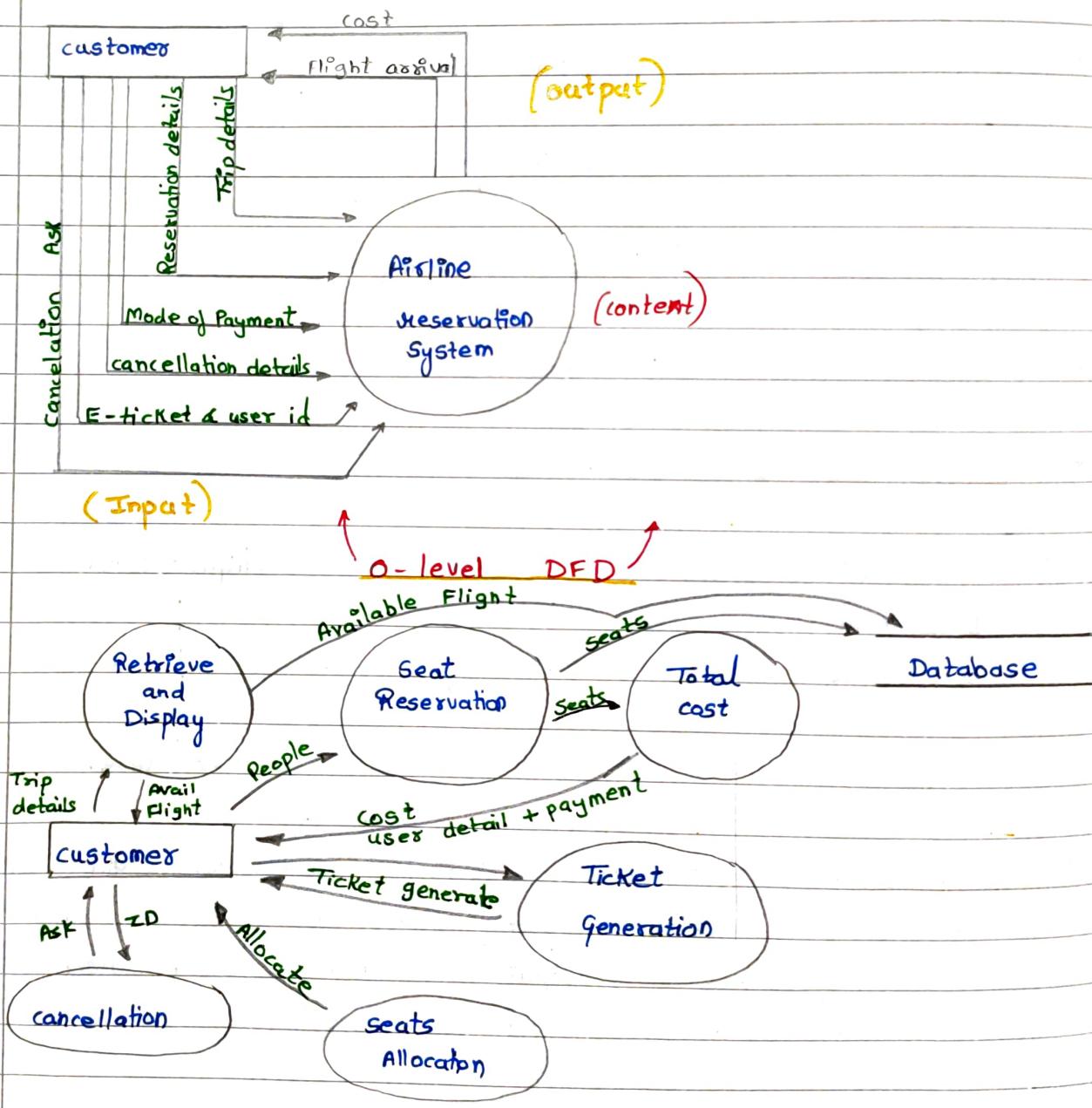
★ levels of the DFDs

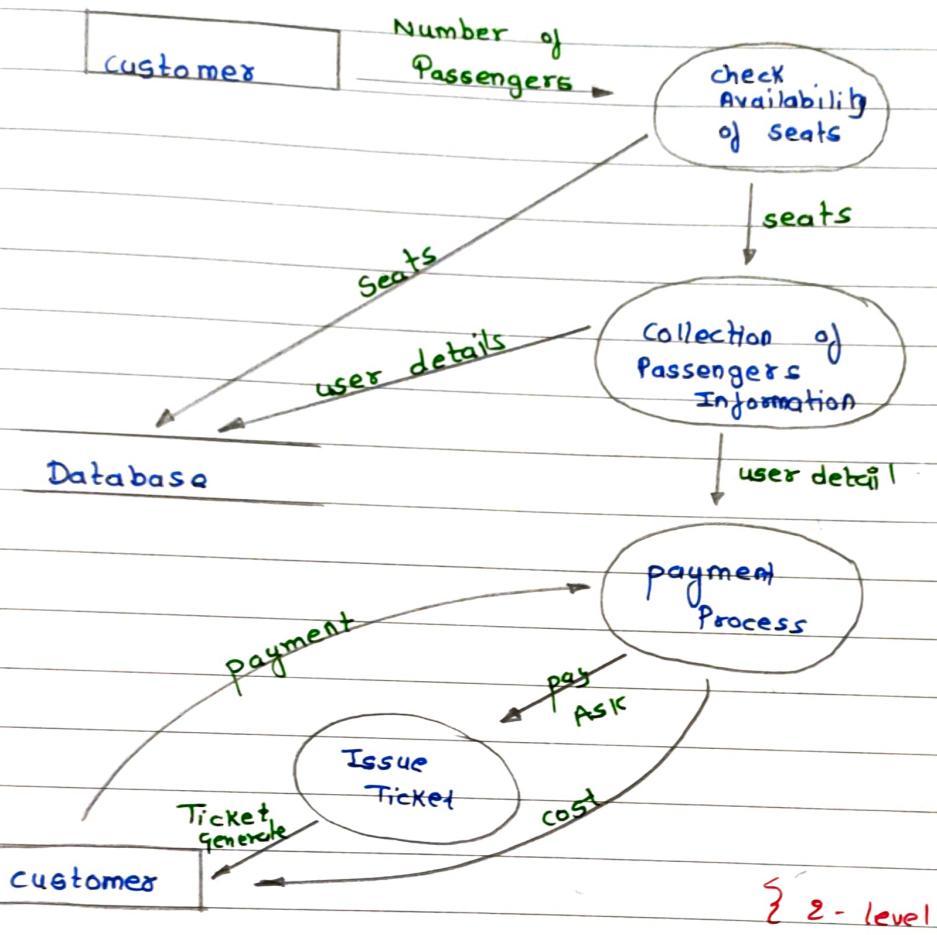
- 1) 0 level (context diagram) Higher level
 - 2) 1 level
 - 3) 2 level
- ⋮
⋮
⋮
⋮
- lower level

1) 0 level DFD - 0 level DFD represents the entire system and as a single bubble with input and output indicated by incoming and outgoing arrows.

- 2) 1-level DFD - In this 0 level DFD decompose into multiple bubbles
- 3) 2-level DFD - In 2nd level each bubble is decomposed into more detailed DFD

Example - Airline reservation system





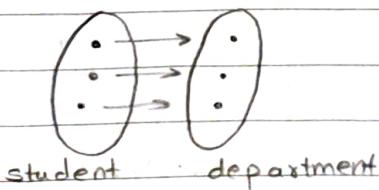
Q- what is ER Diagram ?

→ It is a systematic way of defining a business process, Entity, various attributes. There is one entity relation to another entity in graphically form are called ER Diagram.

◊ Types of relationship btw entities

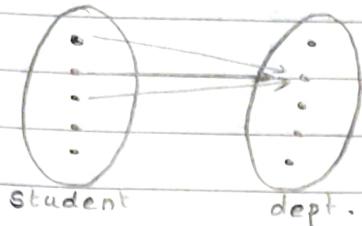
I) one to one

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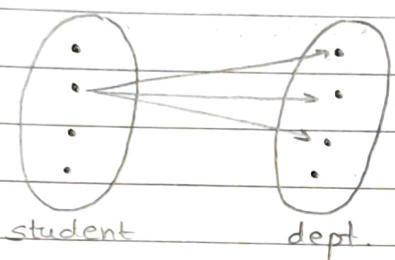
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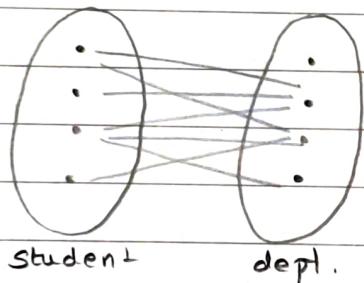
③ One to many

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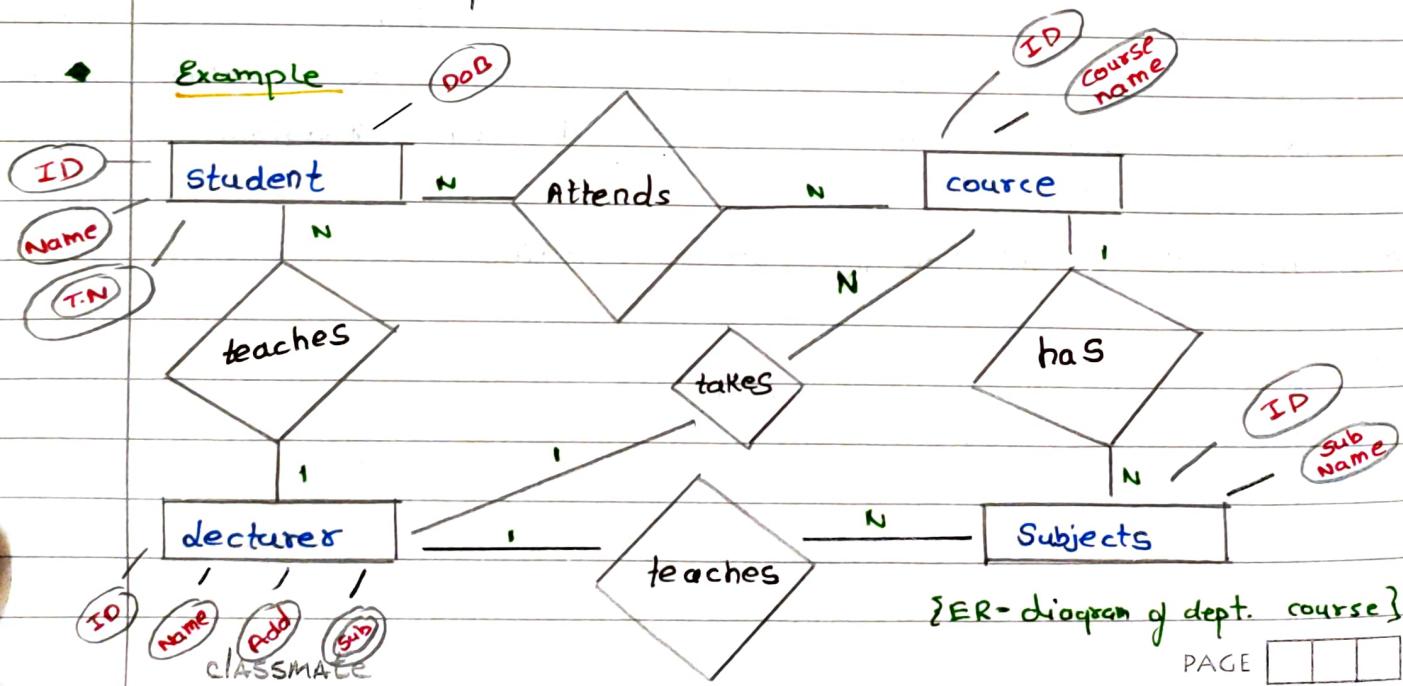
④ Many to many

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Example

DB



* Components of E-R diagram (symbols)

1) Entity - 

2) Attributes - 

3) Derived att. - 

4) multivalued att. - 

5) Relationship - 

6) weak entity - 

* use case Diagrams.
components of use case

* Behavior

modeling.

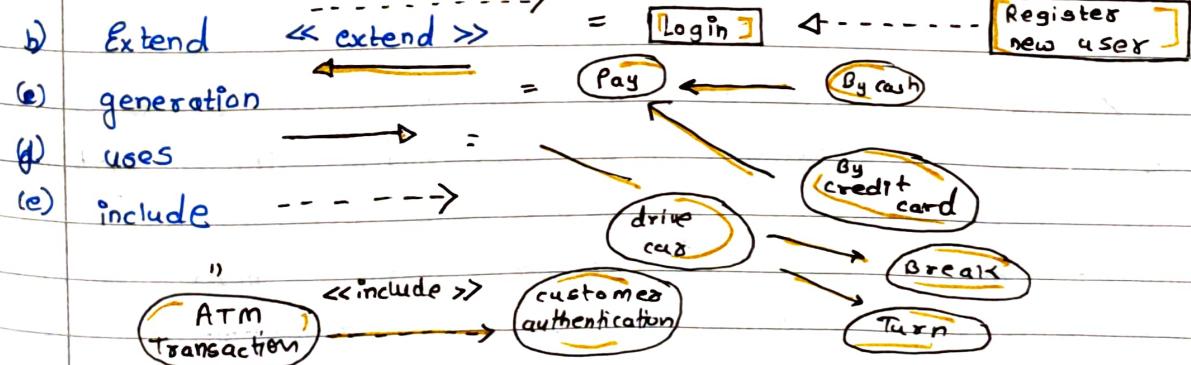
1) Actor

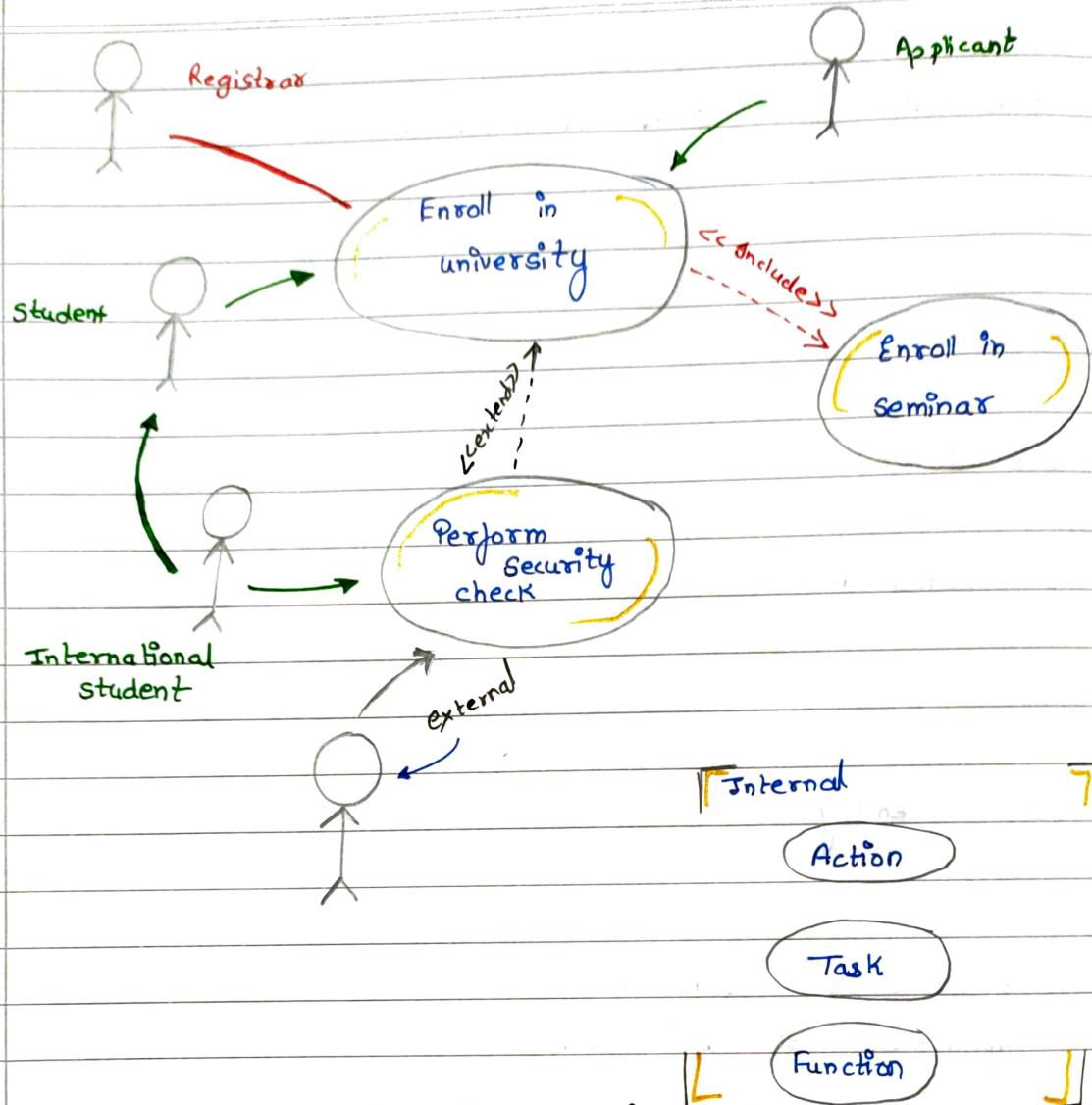
2) use case

3) System Boundary

4) Relation

5) association -





* Behaviour Modeling

- 1) Used-case diagram
- 2) Activity diagram
- 3) Straight machine diagram

1) used-case Diagram - It is a description of a set of interaction between a user and the system.

The components of used case are:-

- a) Actor - Actor is someone that must interact with the system under development.

Actors are not the part of the system.

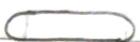
- b) Used case - It is a pattern of behaviour the system exhibits. Used case are sequence of action that the user takes on a system to get particular target. Used case is a dialogue between actor & the system.
- c) System boundary - It helps to identify what is external vs internal.
- d) Relation - It is an association b/w used case & actors
- a) association
 - b) Extend
 - c) generalization
 - d) uses
 - e) include
- Pg no - 49

Example of use-case

Activity Diagram

Notations

1) Actor -



2) Transmission -



3) Starting Point -



4) Ending Points -



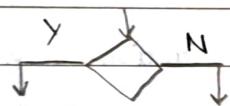
5) Join -



6) Fork -



7) Decision



8) merge -



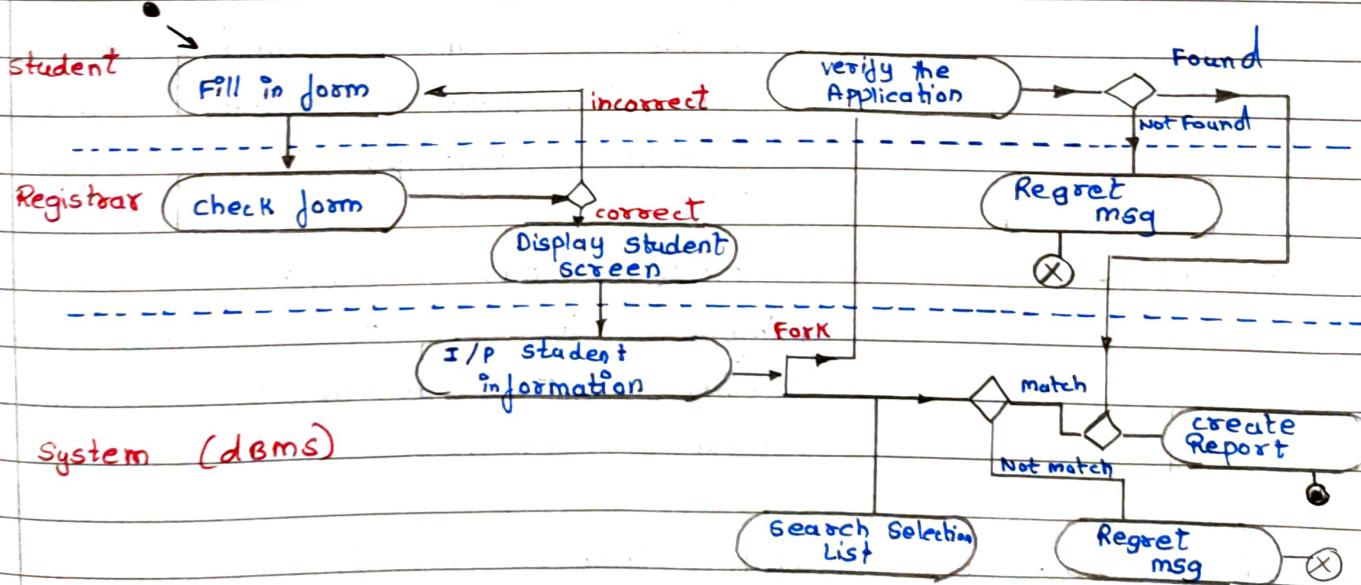
9) Flow Final -



10) Swimlane -



Example ↗



The purpose of activity diagram :-

- 1) Draw the activity flow of Diagram
- 2) Describe the sequence from one activity to another
- 3) Describe the parallel branches concurrent to flow of system.

Notations.

- 1) Activity -  - An activity is some task which needs to be done
- 2) Transmission → when the action of activity state completes flow of control to the next action of activity state passes immediately
- 3) Starting point ● - The source of flow of control
- 4) ending point ○ - The destination of flow of control
- 5) Join -  - A black bar with several flows entries emit and one leaving from it. This denotes end of parallel activities.
- 6) Fork -  - A black bar with one flow going into it and several leaving it. It denotes begining of parallel activities
- 7) Decision -  A Diamond with one flow entry and several leaving. The flow leaving

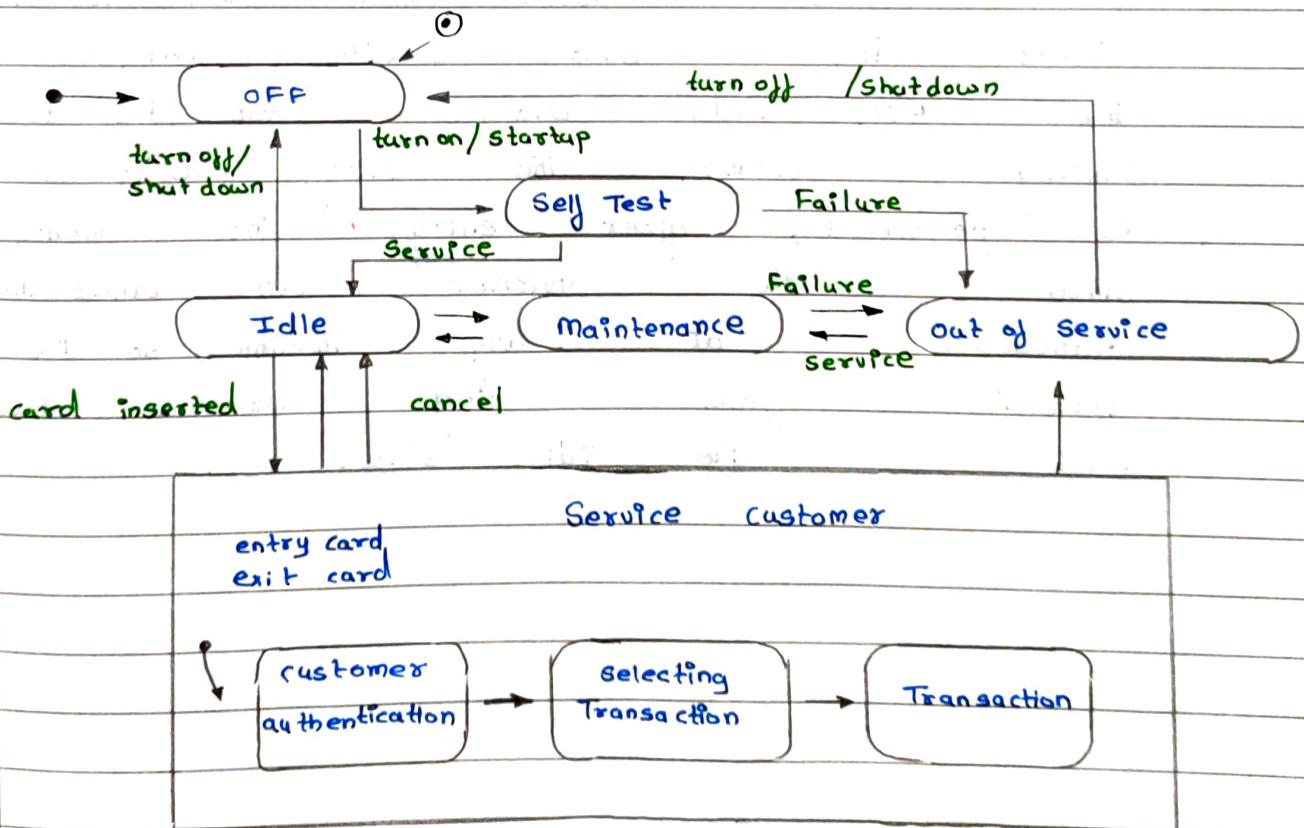
include condition as yes or no.

- 8) Merge  - A Diamond with several entries and one leaving is called Merging

- 9) FlowFinal  - The circle with cross indicates that process stop. and

- 10) Swimlane -  - A partition in activity diagram by means of Dashed lines i.e. swimlane.

→ State Machine Diagram :-



→ Atm card

classmate

Notations :-

- 1) State :- 
- 2) Transition - 
- 3) Event → I/P ↑ event / Action
- 4) Action :-
- 5) Start point :- •
- 6) End Point :- 

Initially the ATM is turned off after the power supply is turn on. The ATM starts performing startup action and entered into self test state. If the self test fails the ATM will enter into out of service state. whenever the customer insert the back credit. card / atm card, the ATM state changes from idle to serving customer. The entry action read card is performed, after entry into serving customer since the customer can cancel the transaction at any instant, so the transition from serving customer state back to the idle state.