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CLASS - IT 3<sup>rd</sup> Year

ROLL - 1854044

Software Engineering Assignment

Paper Code :- INFO 3104

1. State the advantages & disadvantages of Agile Model

Ans- The advantages of Agile Methodology :-

- a) In Agile methodology the delivery of software is unremitting.
- b) The customers are satisfied because after every Sprint working feature of the software is delivered to them.
- c) Customers can have a look of the working feature of the software is delivered to them.
- d) If the ~~the~~ customer has any feedback or any change in the feature then it can be accommodated in the current release of the product.
- e) In Agile methodology the daily interactions are required between the business people and the developers.
- f) In this methodology attention is paid to the good design of the product.

g) (b)) changes in the requirements are accepted even in the later stages of the development.

(ii) The disadvantages of the Agile Methodology are:-

- a) In Agile methodology the documentation is less.
- b) Sometimes in Agile methodology the requirement is not very clear hence it's difficult to predict the expected result.
- c) In few of the projects at the starting of the software development life cycle it's difficult to estimate the actual effort required.
- d) Because of the ever-evolving features, there is always a risk of the ever-lasting project.

2. Briefly describe the stages of SDLC.

Ans The various stages of SDLC, i.e Software Development Life Cycle Process are:-

a) Requirement Gathering and Analysis

During the phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only.

Business analyst and project manager set-up a meeting with the customer to gather all the information like what the customer wants to build, who will be the end-user, what is the purpose of the product. Before building a product a core understanding or knowledge of the product is very important.

b) Design :- In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.

c) Implementation or Coding :-

Implementation or coding starts once the developer gets the design document. The software design is translated into source code. All the components of the software are implemented in this phase.

d) Testing :- Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned to developers to get them fixed.

Retesting, regression testing is done until the point at which the software is as per the customer's expectation. Testers refer SRS document to make sure that the software is as per the customer's standard.

e) Deployment :- Once the product is tested, it is deployed in the production environment or first UAT (User Acceptance testing) is done depending on the customer's expectation.

f) Maintenance :- After the deployment of a product on the production environment, maintenance of the product, i.e., if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developer.

3. Write a short notes on the following topics.

- a) **Structure Chart:** It represents hierarchical structure of modules. It breaks down the entire system into low level functional modules, describe functions and subfunctions of each module of a system to a greater detail. Structure Chart partitions the system into black boxes (functionality of the system is known to the users, inner details are unknown). Inputs are given to the black boxes and appropriate outputs are generated.

Modules at top level called modules at low level. Components are read from top to bottom and left to right. When a module calls another, it views the called module as black box, passing required parameters and receiving results.

- b) **Data Dictionary:** Data Dictionary comprises two

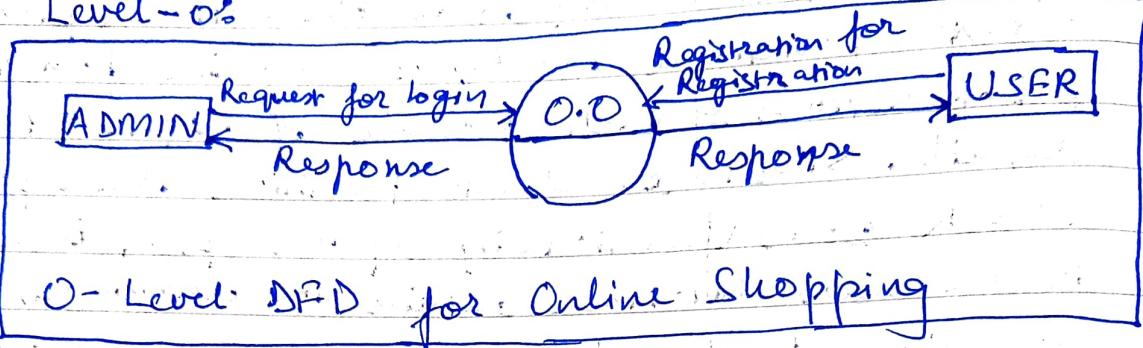
words i.e., data which simply means information being collected through some sources and dictionary means where this information is available.

Data dictionary can be defined as collection of information of all data types, text descriptions of system. It makes it easier for user and analyst to use data as well as understand and have common knowledge about inputs, outputs, components of a database, and intermediate calculations.

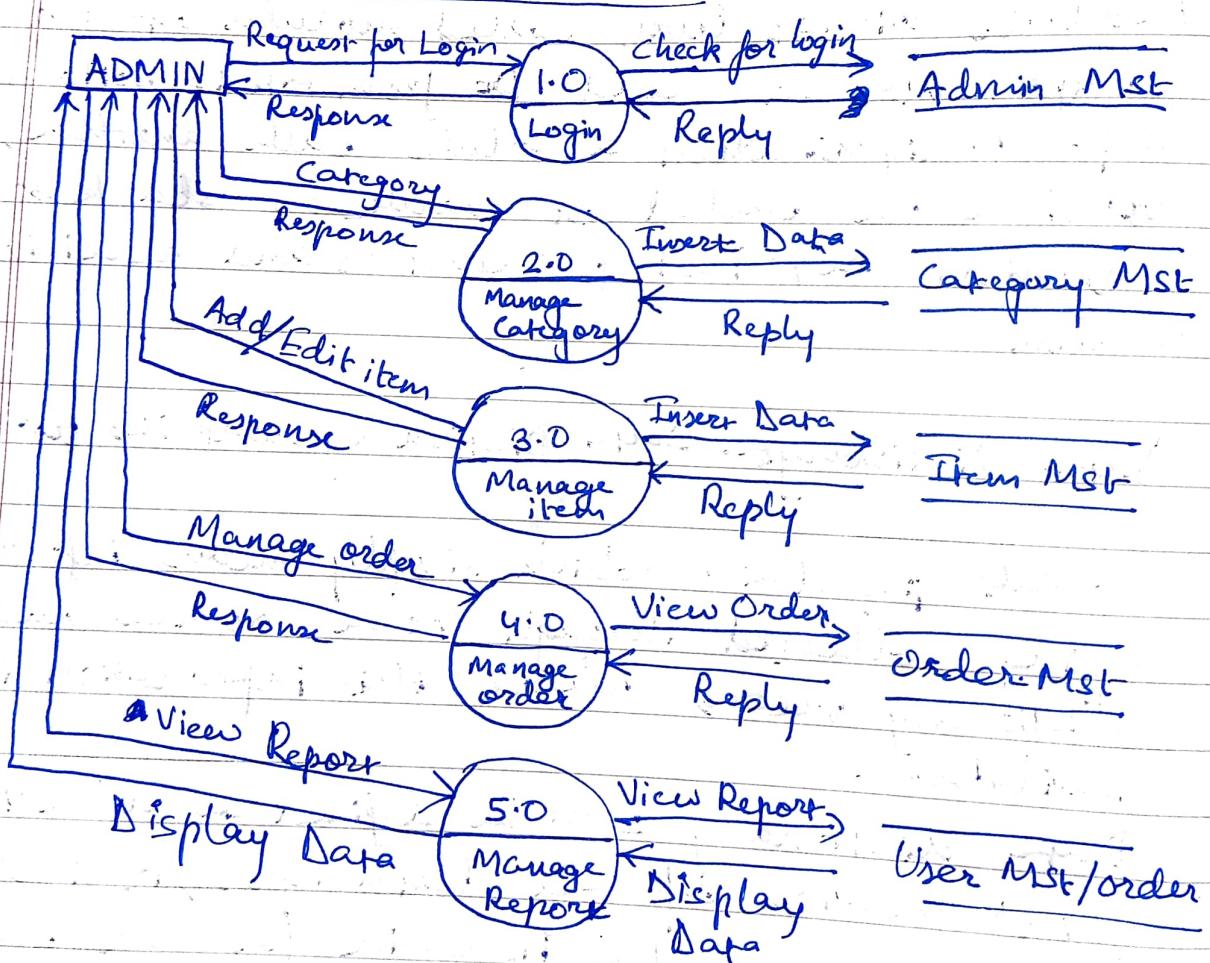
4. Draw a DFD (upto level 2) on typical online shopping system.

Aux:

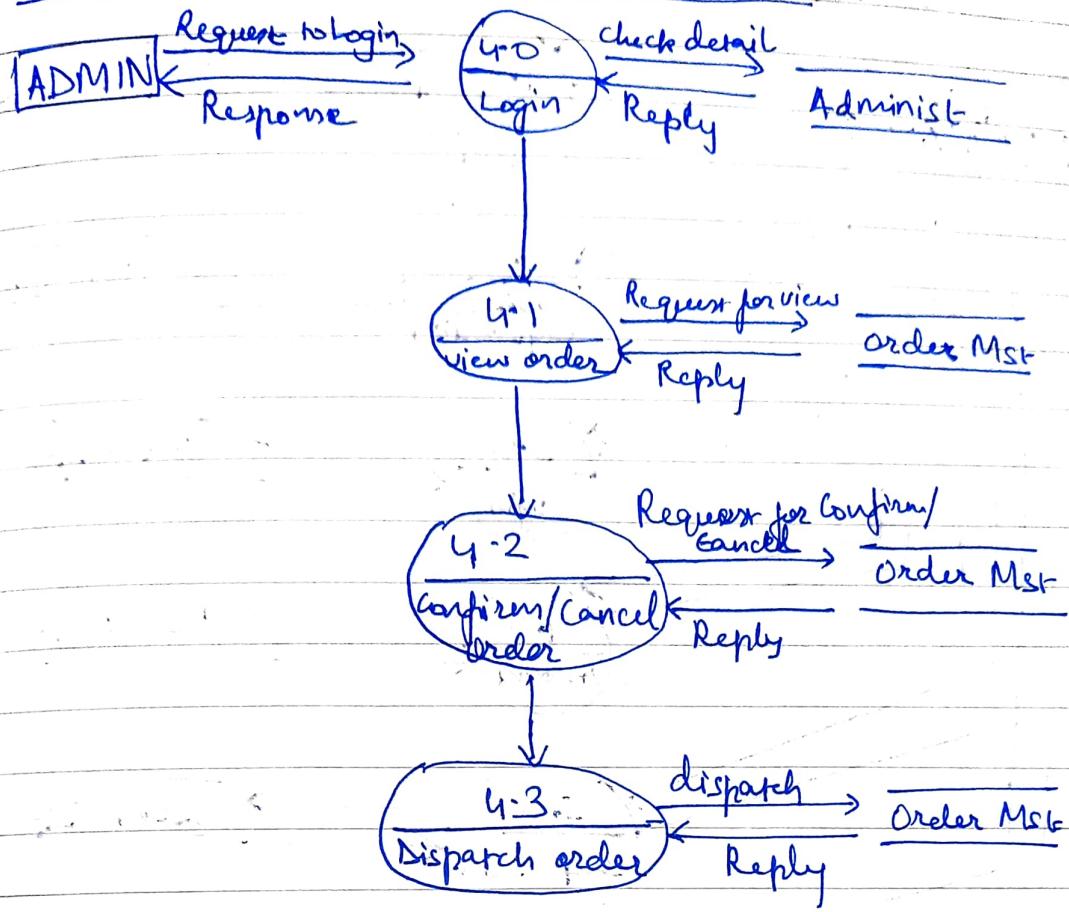
Level - 0:



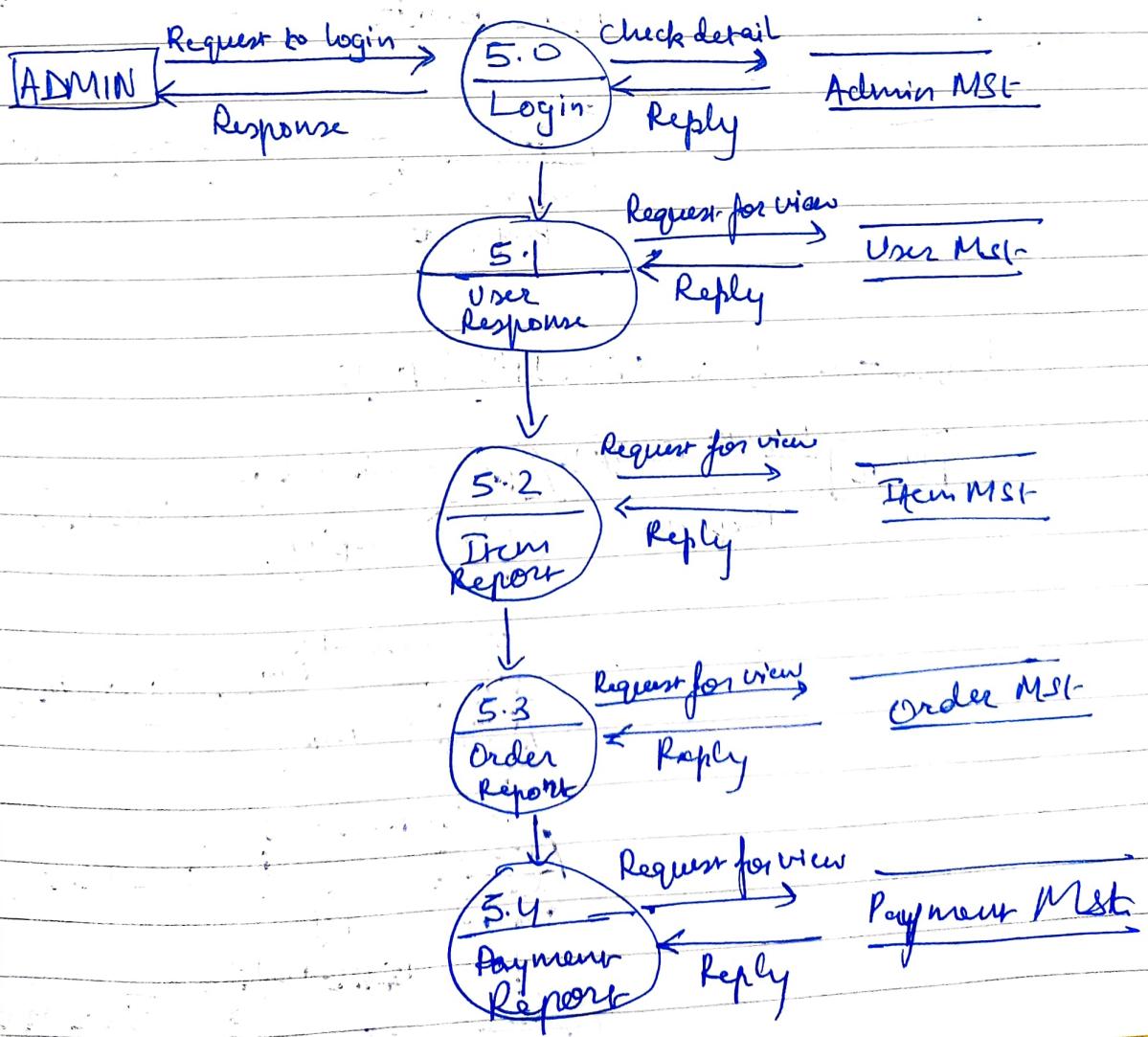
Admin Side DFD Level-1:



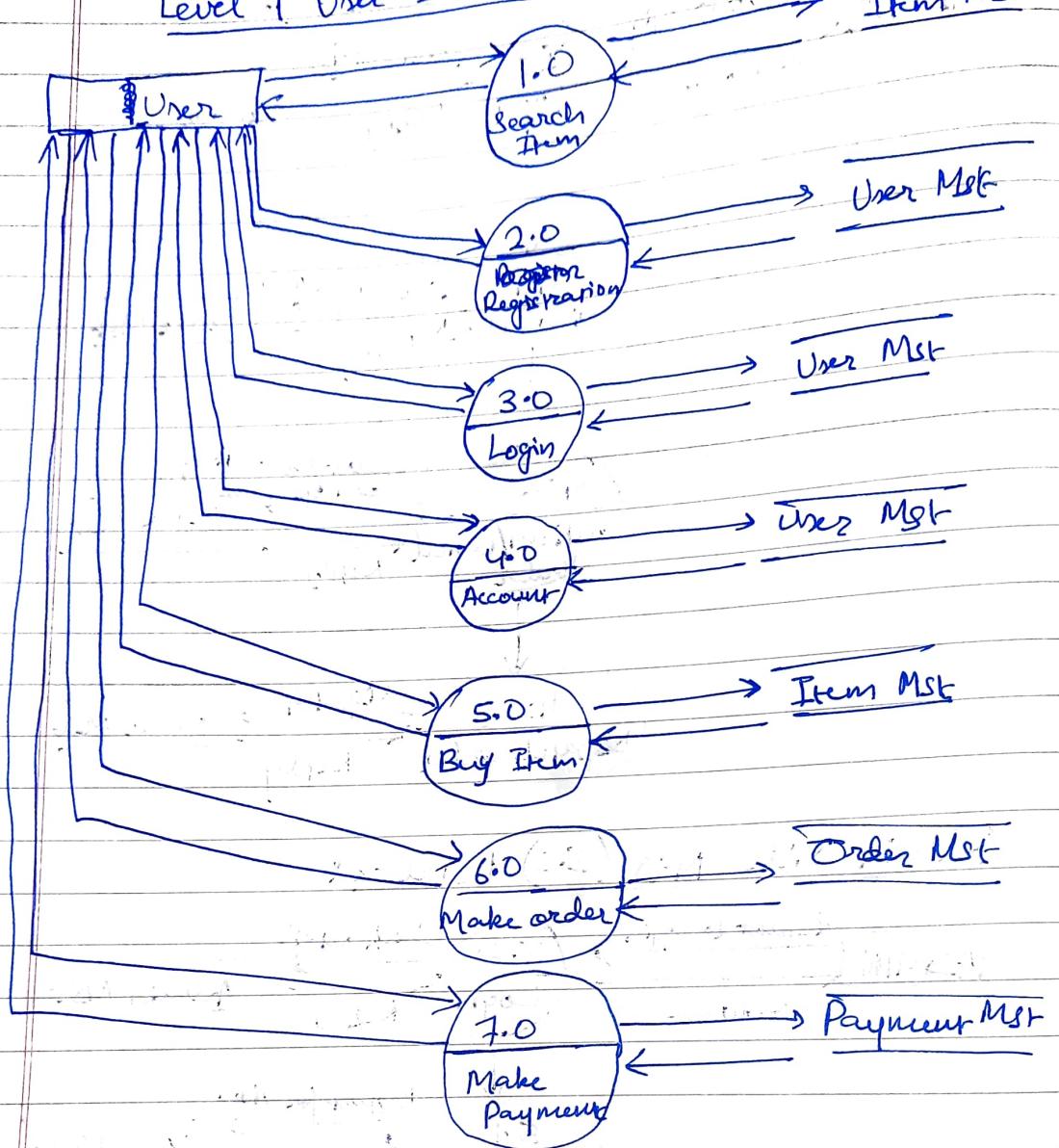
## Admin Side DFD (4.0) Level - 2 :



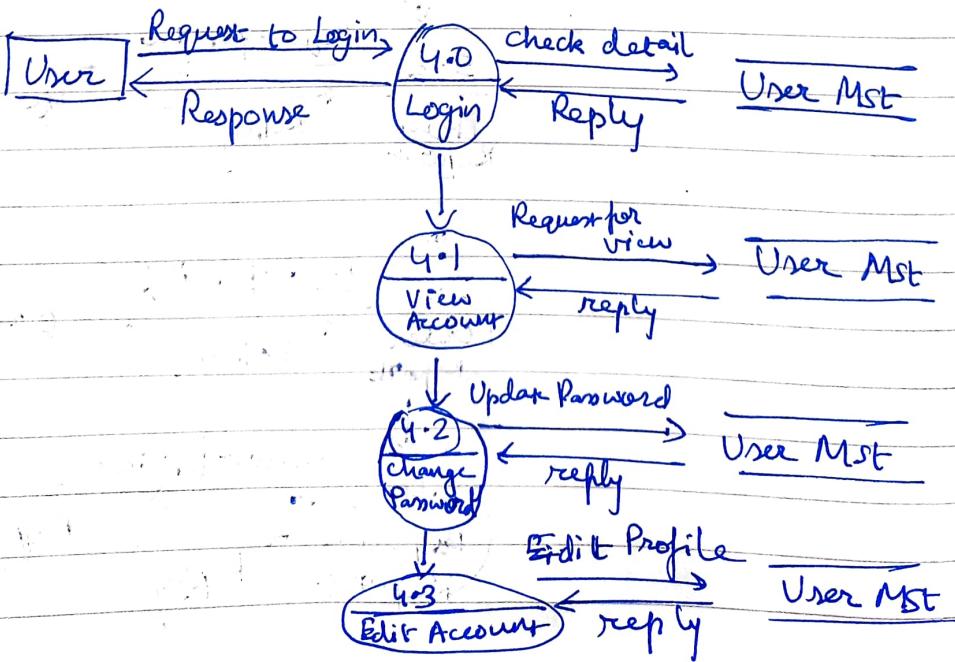
## Admin Side DFD (5.0) Level - 2 :



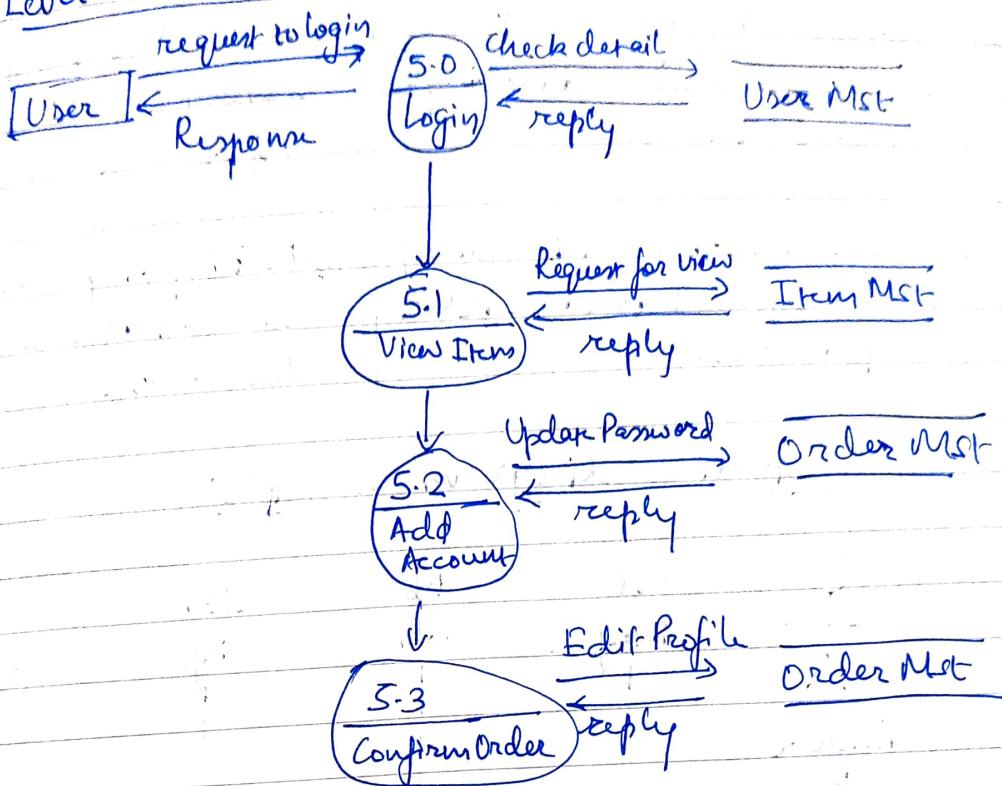
## Level 1 User Side DFD



## Level - 2 User Side DFD (4.0)



## Level-2 User Side DFD (5.0):



5. Differentiate b/w sequence diagram & activity diagram with help of suitable example.

### Ans. Sequence Diagram

a) The sequence diagram represents the UML, which is used to visualize the sequence of calls in a system that is used to perform a specific functionality.

b) The sequence diagram shows the message flow from one object to another object.

c) Sequence diagram is used for the purpose of dynamic model modelling.

### Activity Diagram

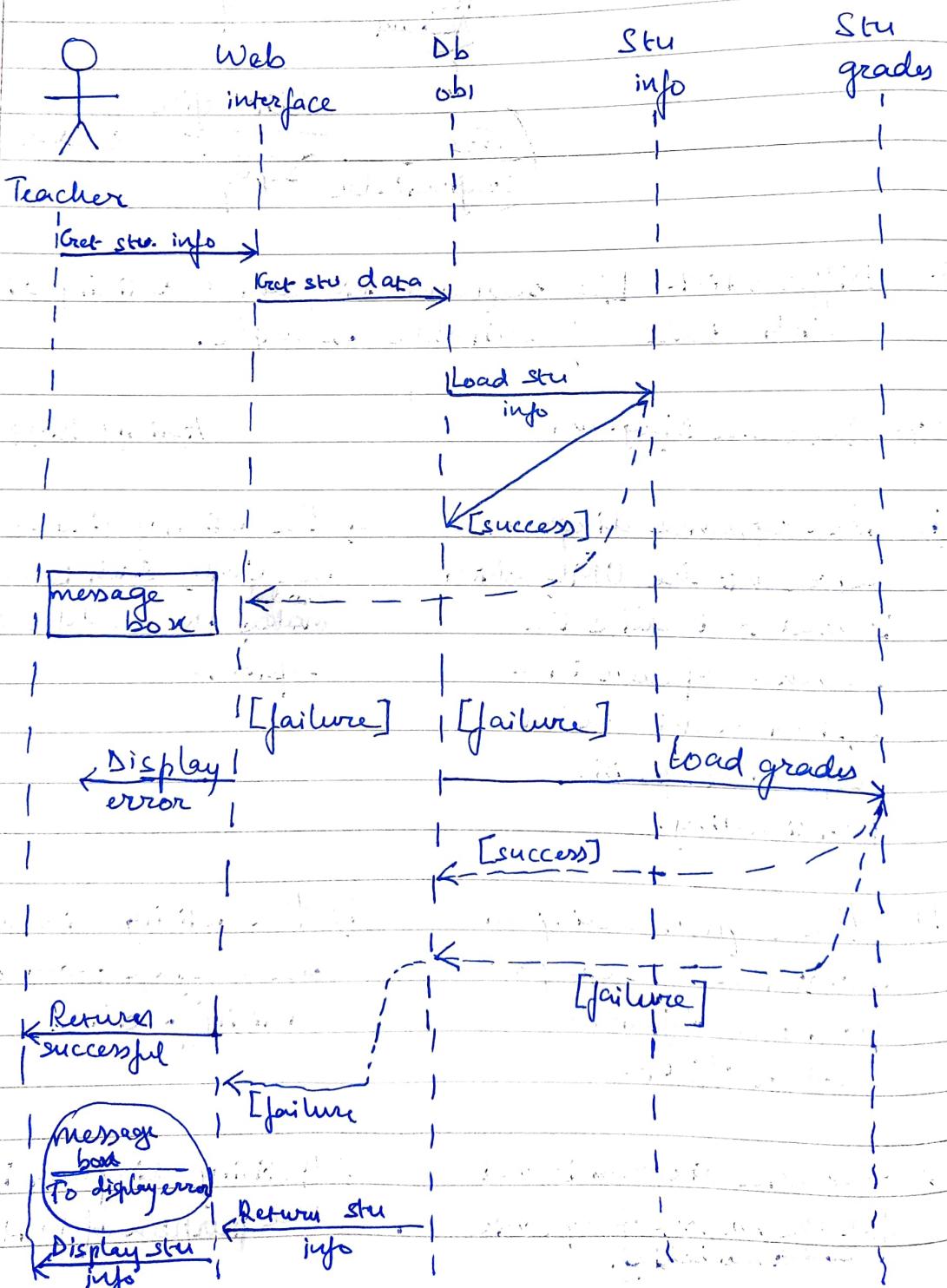
a) The activity diagram represents the UML, which is used to model the workflow of a system.

b) The activity diagram shows the message from one activity to another.

c) Activity diagram is used for the purpose of functional modelling.

- d) Sequence diagram is used to describe the behaviour of several objects in a single use case.
- e) Sequence diagram is mainly used represent the time order of a process.
- d) Activity diagram is used to describe the general sequence of actions for several objects and use cases.
- e) Activity diagram is used to represent the execution of the process.

### Sequence diagram examples



6. What is the basic difference b/w a Gantt chart & PERT chart? If you were a project manager, then in which phase of SDLC you prefer to schedule a project and why?

### Gantt Chart

- a) Gantt chart exactly determines the time frame required for each task to get completed but when it comes to large projects the chart will be difficult to understand.
- b) Gantt chart cannot display interdependency b/w the tasks.
- c) Gantt chart will be useful for small, simple and straight forward projects.
- d) Gantt chart displays project details using a bar chart.
- e) Gantt chart uses bars where length and position explain the start date, end date and duration of the tasks.

### PERT Chart

- a) PERT chart will determine the accurate information of the complete project broken into activities but cannot exactly predict time frames for each activity.
- b) PERT chart display network of interdependent tasks.
- c) <sup>PERT</sup> PERT chart will be useful for large and complex projects.
- d) PERT chart display project information using a flow chart or network diagram.
- e) PERT chart uses boxes and arrows to display tasks or activities and their dependence.

As a project manager, I would prefer to schedule my project in plan design phase because since now, I have gathered all the requirements and have

carefully analysed my requirements. Since I have all the information, it would be of great use to plan my project schedule from now onwards.

7. Suppose a system for office automation has to be designed. There are 4 modules based on organic category. type of project :

Data Entry : 0.6 KLOC

Data Update : 0.6 "

Query : 0.8 "

Report Generation : 1.0 "

The ratings for different cost driver attribute are as follows:

Complexity : 1.15  
Storage : 1.06

Experience : 1.13

Programmer Capability : 1.17

Find Effort and Duration required to finish the project.

Aust Since it is a detailed model of COCOMO, KLOC would be :-  $(0.6 + 0.6 + 0.8 + 1.0) \text{ KLOC}$ , KLOC = 3 KLOC

Since it is organic model, the value for a, b, c, d will be - 3.2, 1.05, 2.5, 0.38 respectively

$$\therefore \text{Effort} = a(\text{KLOC})^b \text{ EAF}$$

$$\text{EAF} = 1.15 \times 1.06 \times 1.13 \times 1.17 \approx 1.612$$

$$\text{Effort} = 3.2(3)^{1.05} \times 1.612 \approx 16.35 \text{ PM}$$

$$\text{Duration} = c(\text{Effort})^d$$

$$= 2.5 \times (16.35)^{0.38} \approx 7.25 \text{ M}$$

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Assignment-No-3.

Ques

1. Explain J2EE three tier architecture.

J2EE uses three tiers:

- i) Client tier
- ii) Middle tier.
- iii) Enterprise Data.

1. Client tier:

The client tier consist of programs or applications interact with the user. Usually they are located in a different machine from the server. Client tier prompts the user inputs into user requests then forwarded to the J2EE server then processed result returned back to the client. A client can be a web browser, standalone application or server that runs on a different machine.

Clients can be classified as a web client and application client.

2. Middle tier (Web tier & EJB Tier):

Below are the components of Middle Tier.

3. Web Tier / Web component: Web components can be servlet or JSP pages. Servlets can dynamically process the request and generate responses compared to JSP and serve servlets - servlets are dynamic pages to some extent but JSP pages are static in nature.

During application assembly process clients static HTML programs and applet codes

are bundled in web tier / web components. Actually these HTML and applets are not considered as elements of web components. Actually these HTML and applets are not considered as elements of web components server-side utility classes are also bundled with web component, but they are not considered as web components.

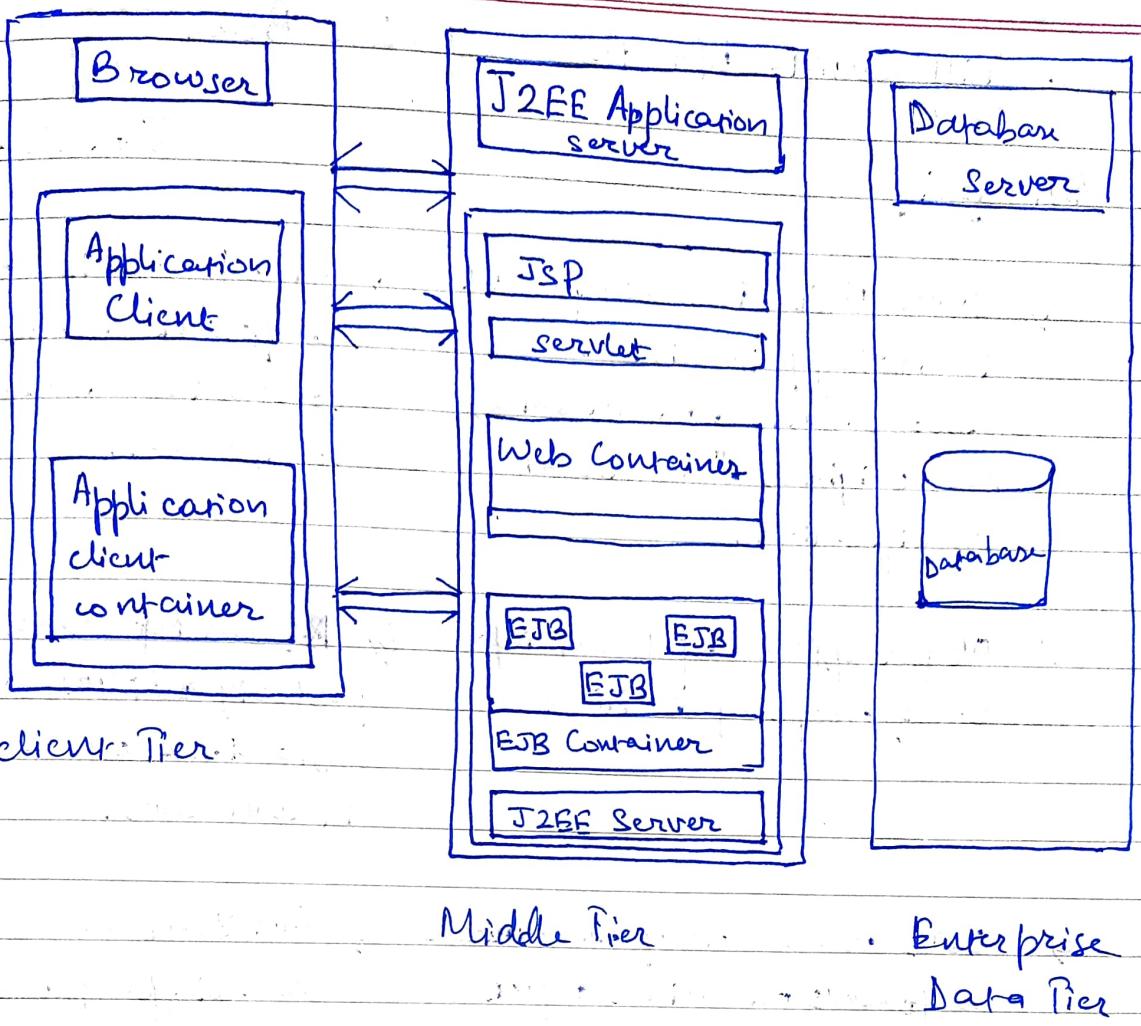
Web tier might include EJB components for processing user inputs and sends the input to Enterprise bean running in the business tier.

### EJB Tier / EJB Components

Enterprise components handle usually business code that is logic to solve particular business domains such as banking or finance are handled by enterprise bean running in the business tier. enterprise container receives data from client, processes if necessary, send it to the enterprise information system for storage. Enterprise bean also retrieves data from storage, processes it and sends it back to the client.

### 3. Enterprise data Tier:

This tier consists of database servers, enterprise resource planning systems and other data sources. Resources are typically other data source. Resource are typically located on a separate machine than the J2EE server and accessed by components on the business tier.



2 Differentiate between stub and skeleton.

- Ans:
- i) Stub belongs to receiver side
  - ii) Skeleton belongs to service provider side.
  - iii) The stub hides the serialization of parameters and network-level communication in order to present a simple invocation mechanism to the caller.  
The skeleton is responsible for dispatching the call to the actual remote object implementation.
  - iv) A stub is a small program routine that substitutes for a longer program, possibly to be loaded later on that is located remotely.  
A skeleton for a remote object is a server-side entity that dispatches calls to the actual remote object implementation.

### 3. Differentiate b/w EJB and Java Bean

Ans:-

#### EJB

- a) Even EJB is a component technology, it neither reconstructs nor enhances the original Java Bean specification.
- b) No perception of Bean info classes, property editors or customizers can be present in EJBs.
- c) EJBs are remotely executable components on business objects.
- d) An EJB is a non-visual isolated object.

#### Java Bean

- a) Java beans is a component technology to create universal Java components.
- b) Bean info classes, property editors or customizers can be present in Java beans.
- c) Java Beans are designed for a single process and localized.
- d) JavaBeans may be visible or non-visible components.

### 4. Explain different types of XML parser.

Ans:- XML parser provides a way to access or modify data in an XML document. Java provides multiple options to parse XML documents. Following are various types of parsers which are commonly used to parse XML documents.

- a) DOM parser - Parses an XML document by reading the complete contents of the document and creating its complete hierarchical tree in memory.

- b) SAX parser - Parses an XML document on event-based triggers. Does not load the complete document into the memory.
- c) JDOM Parser - Parses an XML document in a similar fashion to DOM parser but in an easier way.
- d) STAX parser - Parses an XML document in a similar fashion to SAX parser but in a ~~more~~ more efficient way.
- e) XPath Parser - Parses an XML document based on expression and is used extensively in conjunction with XSLT
- f) DOM4J Parser - A java library to parse XML, XPath, and XSLT using Java collections framework. It provides support for DOM, SAX and JAXP.