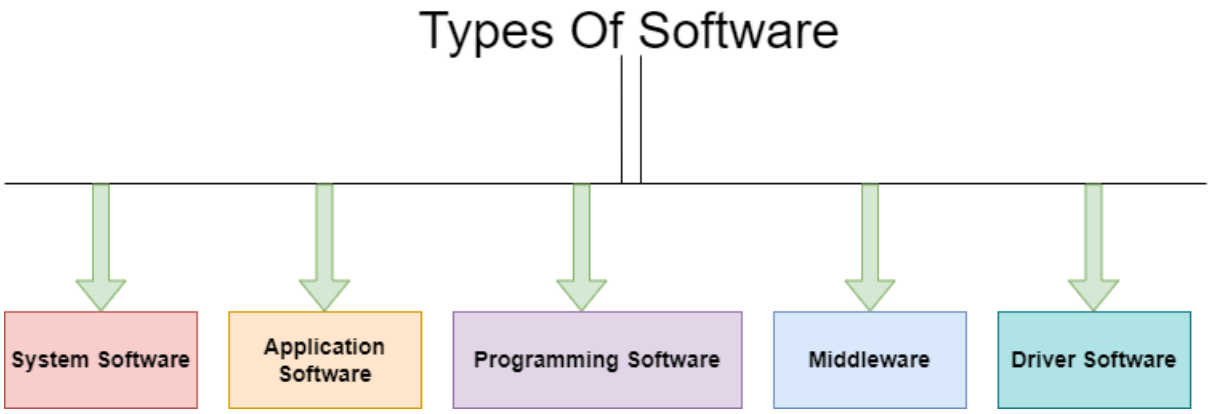
MODULE: 1 (SDLC)

1. What is software? What is software engineering?

- **Software:**
  - ✓ The software is basically a set of instructions or commands that tells a computer what to do.
  - ✓ It's the non-physical component of a computer system that enables it to perform various functions, from simple calculations to complex processes.
  - ✓ Software refers to a collection of computer programs, data, and related documentation that provides instructions to a computer system on how to perform specific tasks.
  - ✓ The software is a computer program that provides a set of instructions to execute a user's commands and tell the computer what to do.
  - ✓ For example like MS-Word, MS-Excel, PowerPoint, etc.

- **Software Engineering:**
  - ✓ Software Engineering is a subdomain of Engineering in which you learn to develop, designing, testing, and maintenance of software using a systematic and structured approach.
  - ✓ Software Engineering is the process of Designing, Development, Testing and Maintaining Software.
  - ✓ It is a systematic and disciplined approach to software development that aims to create high-quality, reliable and maintainable software.
  - ✓ Software is a collection of programs and that programs are developed by software engineers.
  - ✓ Software Engineering include a verity of techniques, tools (C, C++, etc) and methodologies, including requirements analysis , design, testing and maintenance.
  - ✓ To develop ability to solve complex programming problems.

2. Explain types of software



I. **System Software**: It is responsible for controlling, integrating the hardware components of a system so the software and the users can work with them.

   a. Operating Systems: Software that manages hardware and provides services for other software.
   b. Device Drivers: Software that enables communication between the operating system and hardware devices.
   c. Utilities: Tools that perform various system-related tasks, like file management, disk optimization, and system maintenance.

II. **Application Software**: Application software is a kind of software that performs specific functions for the end user by interacting directly with it.
They basically lie over system software.

   a. Word Processing Software: Allows users to create, edit, and format text documents (e.g., Microsoft Word, Google Docs).
   b. Spreadsheet Software: Used for creating and manipulating spreadsheets for calculations and data analysis (e.g., Microsoft Excel, Google Sheets).
   c. Presentation Software: Enables creation of visual presentations with slides and multimedia elements (e.g., Microsoft PowerPoint, Google Slides).
   d. Graphics Software: Used for creating and editing digital images and graphics (e.g., Adobe Photoshop, GIMP).
   e. Database Software: Manages and organizes data in structured formats, often used for data storage and retrieval (e.g., Microsoft Access, MySQL).
   f. Web Browsers: Software used to access and navigate the World Wide Web (e.g., Google Chrome, Mozilla Firefox).
   g. Email Clients: Applications for sending, receiving, and managing emails (e.g., Microsoft Outlook, Apple Mail).
   h. Media Players: Play audio and video files (e.g., VLC Media Player, Windows Media Player).
   i. Gaming Software: Video games and related software, including game engines and development tools.
   j. Productivity Software: Tools for project management, collaboration, and organization (e.g., Trello, Asana, Slack).

III. **Programming Software**: Programming software is a tool for creating computer code that allows computer software to operate.

a. Integrated Development Environments (IDEs): Provide tools for writing, testing, and debugging code (e.g., Visual Studio, Eclipse).
b. Text Editors: Simplified tools for writing and editing code (e.g., Notepad++, Sublime Text).

IV. **Driver software:** Also known as device drivers, this software is often considered a type of system software.
Device drivers control the devices and peripherals connected to a computer, enabling them to perform their specific tasks.
Every device that is connected to a computer needs at least one device driver to function.
Examples include software that comes with any nonstandard hardware, including special game controllers, as well as the software that enables standard hardware, such as USB storage devices, keyboards, headphones and printers.

V. **Middleware**: The term *middleware* describes software that mediates between application and system software or between two different kinds of application software.

For example, middleware enables Microsoft Windows to talk to Excel and Word.

It is also used to send a remote work request from an application in a computer that has one kind of OS, to an application in a computer with a different OS.

It also enables newer applications to work with legacy ones.

3. What is SDLC? Explain each phase of SDLC

- ✓ Software development is the process of developing software through successive phases in an orderly way.
- ✓ Software development is the computer programming, documenting, testing and bug fixing involved in creating and maintaining applications and framework involved in software life cycle and resulting in a software product.
- ✓ Three most common being for software development
- ✓ To meet specific needs of specific clients.
- ✓ To meet a perceived need of some set of potential users.
- ✓ To develop for personal use.
- ✓ Software development process is a set of steps that a software program goes through when developed.
- ✓ The phases of software development process are
  - Requirement gathering & Analysis
  - Design
  - Development (Implementation / Coding)
  - Testing
  - Documentation
  - Maintenance.

- In **analysis or requirement phase**, the goals of what the program will be capable of doing is decided.
- The **design phase** covers how the program is going to be created, who will be doing what etc.
- The **development phase** is where the programmers and other designers start work on the program.
- **Testing and verification phase** can begin to help verify the program has no error. During this phase, problems are fixed, until the program meets the requirement.
- The **documentation phase** tells how to use the program or project.
- Finally, **maintaining** the program must continue for several years after the initial release.

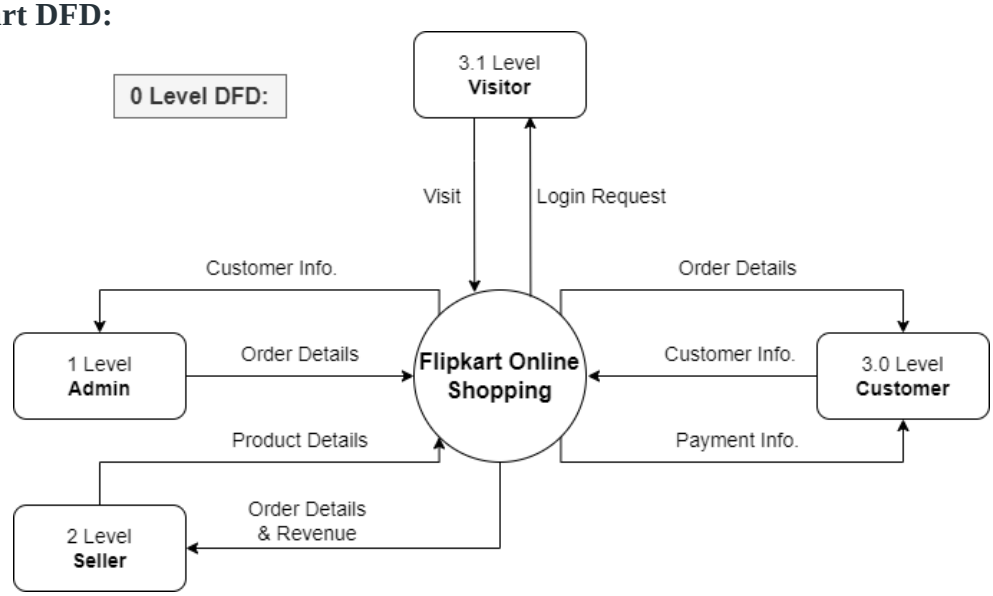
4. What is DFD? Create a DFD diagram on Flipkart

- **DFD:**
  - ✓ DFD stands for "**Data Flow Diagram**" It is a visual representation used in systems analysis and design to depict (a representation in words or images of something) how data moves through a system or process.
  - ✓ DFDs are commonly used to model the flow of data within software systems, business processes, and any other complex systems where data needs to be captured, processed, stored, or transferred.
  - ✓ It is used to transform a textual description into graphical form.
  - ✓ It examines the detailed structure of the system.
  - ✓ It identifies the processes and data flow among these processes.
  - ✓ In structure analysis, analysis of data flow is represented diagrammatically by DFD.

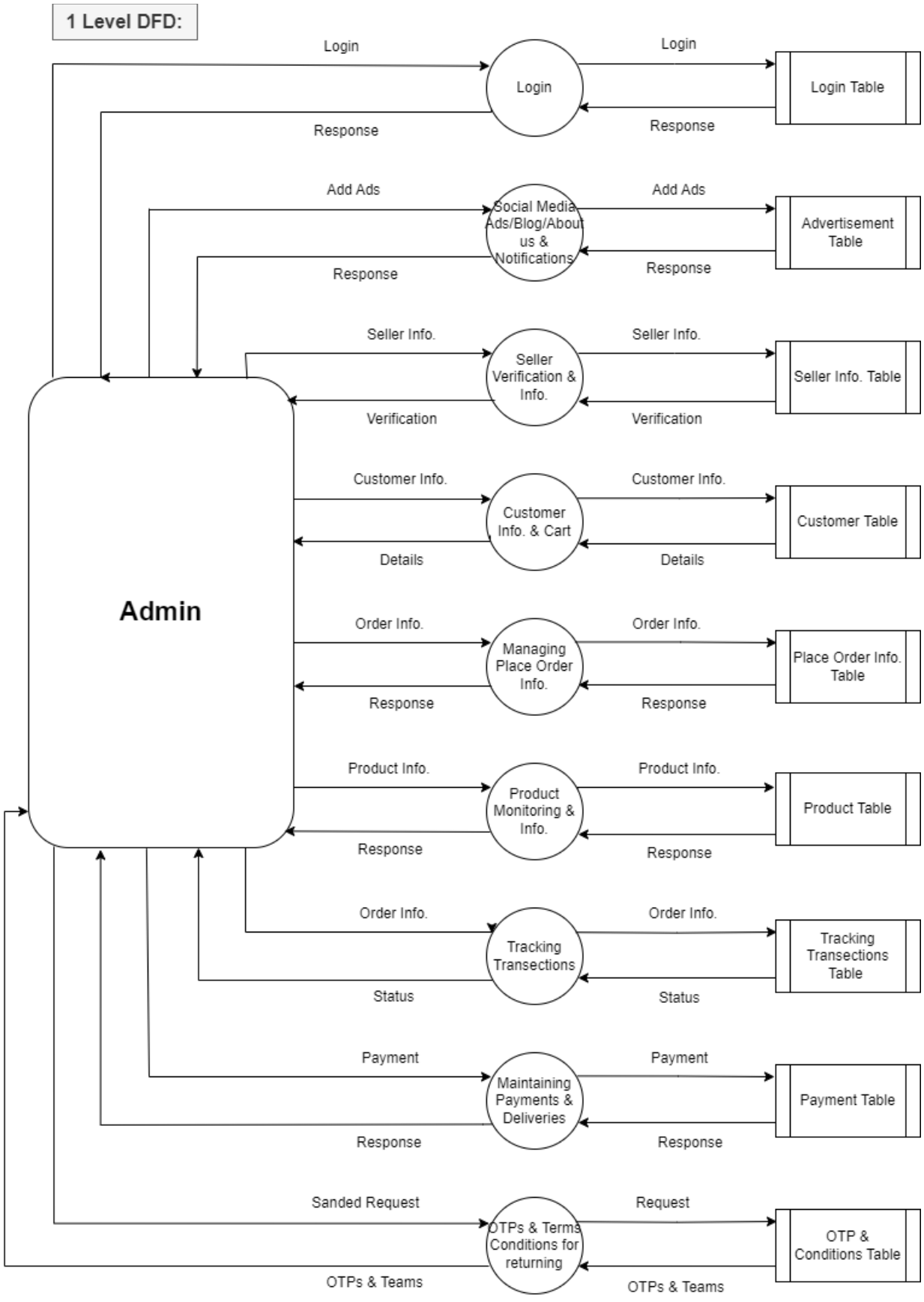
- **Levels of DFD**
  - ✓ DFD uses hierarchy to maintain transparency thus multilevel DFD's can be created.
  - ✓ Levels of DFD are as follows:

    • **0-level DFD**: It represents the entire system as a single bubble and provides an overall picture of the system.
    • **1-level DFD**: It represents the main functions of the system and how they interact with each other.
    • **2-level DFD**: It represents the processes within each function of the system and how they interact with each other.
    • **3-level DFD**: It represents the data flow within each process and how the data is transformed and stored.

- **Flipkart DFD:**



1 Level DFD: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Add Ads
Social Media Ads/Blog/About us & Notifications
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Seller Info.
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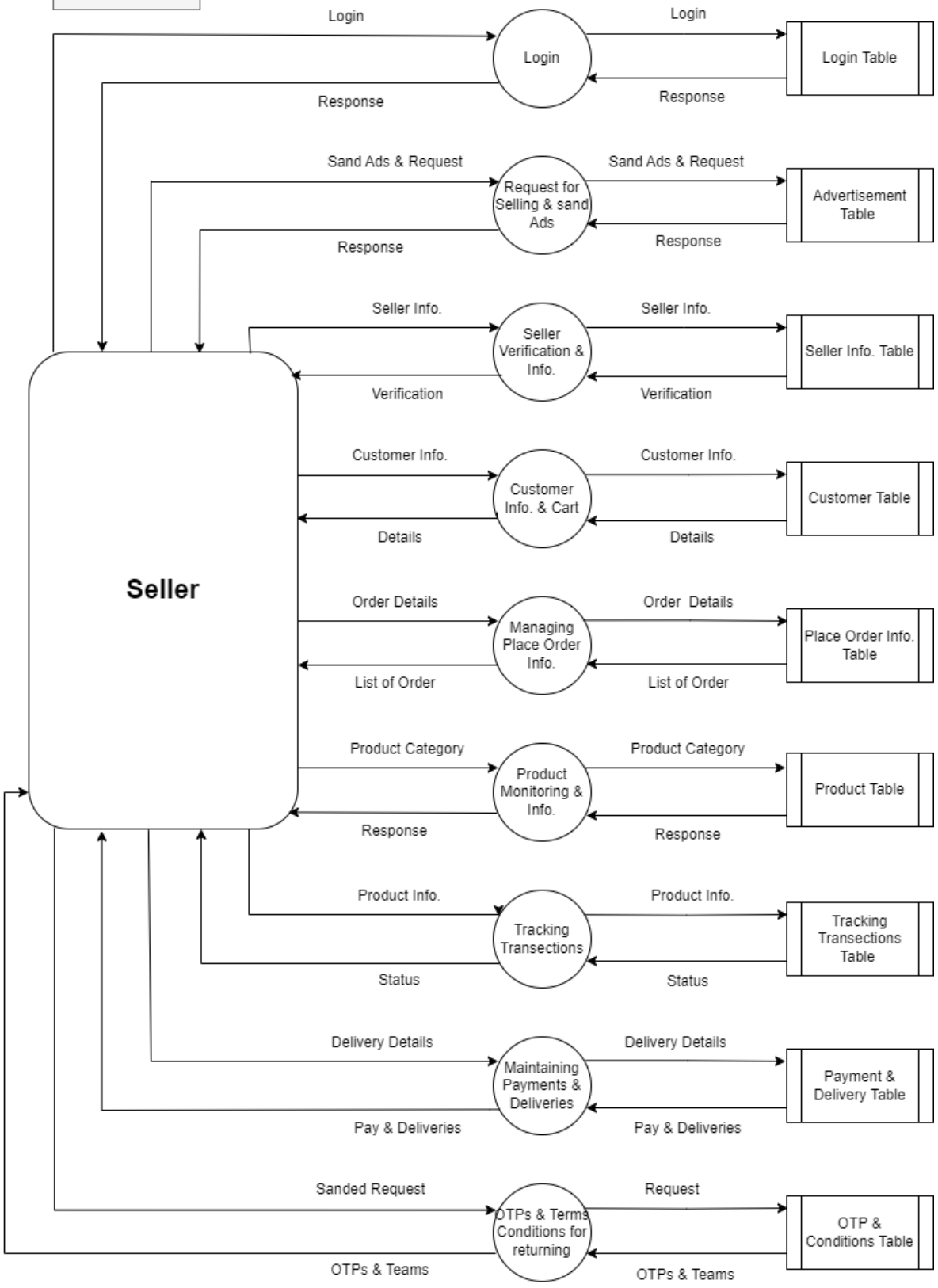
2 Level DFD: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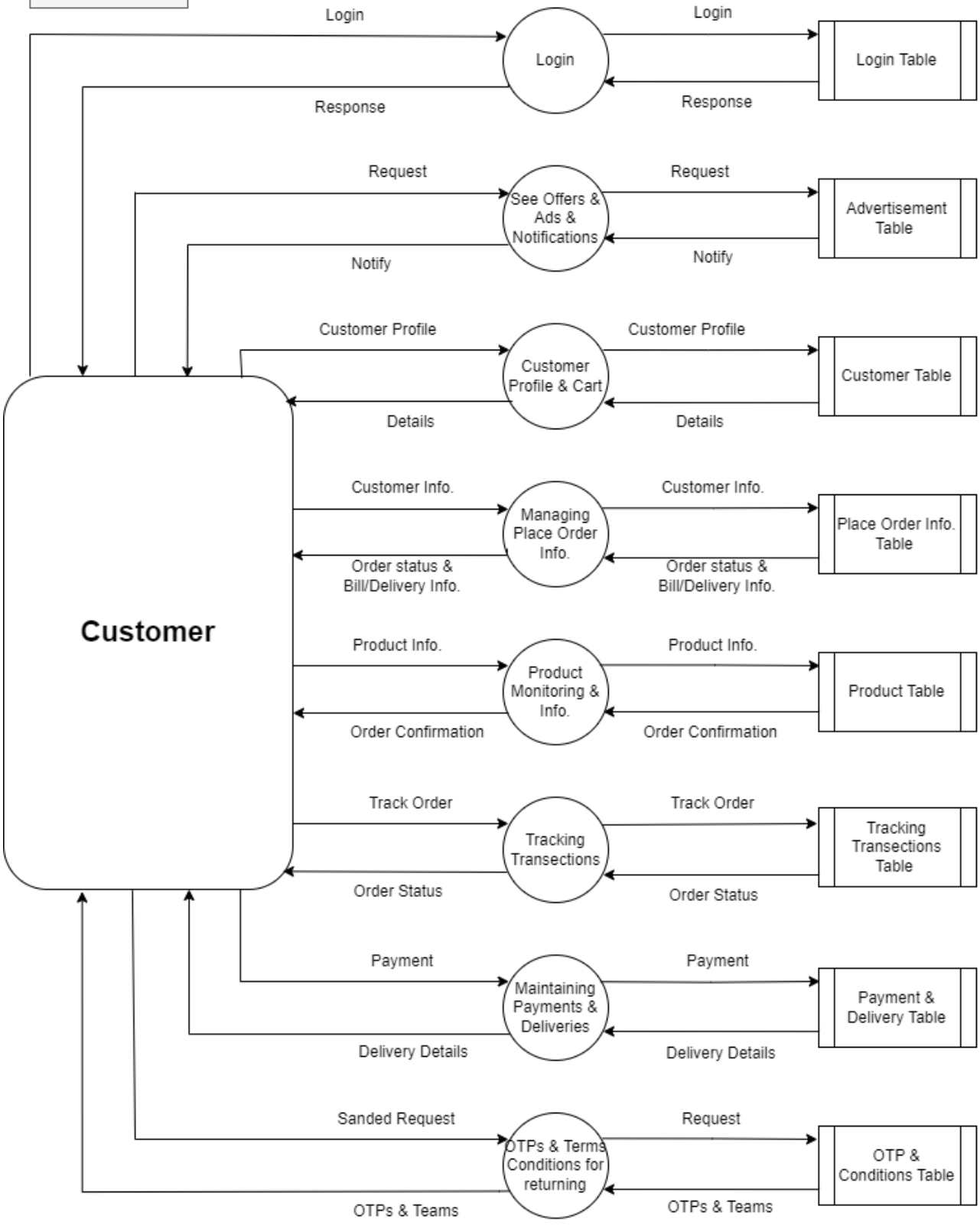
OTPs & Teams

3.0 Level DFD: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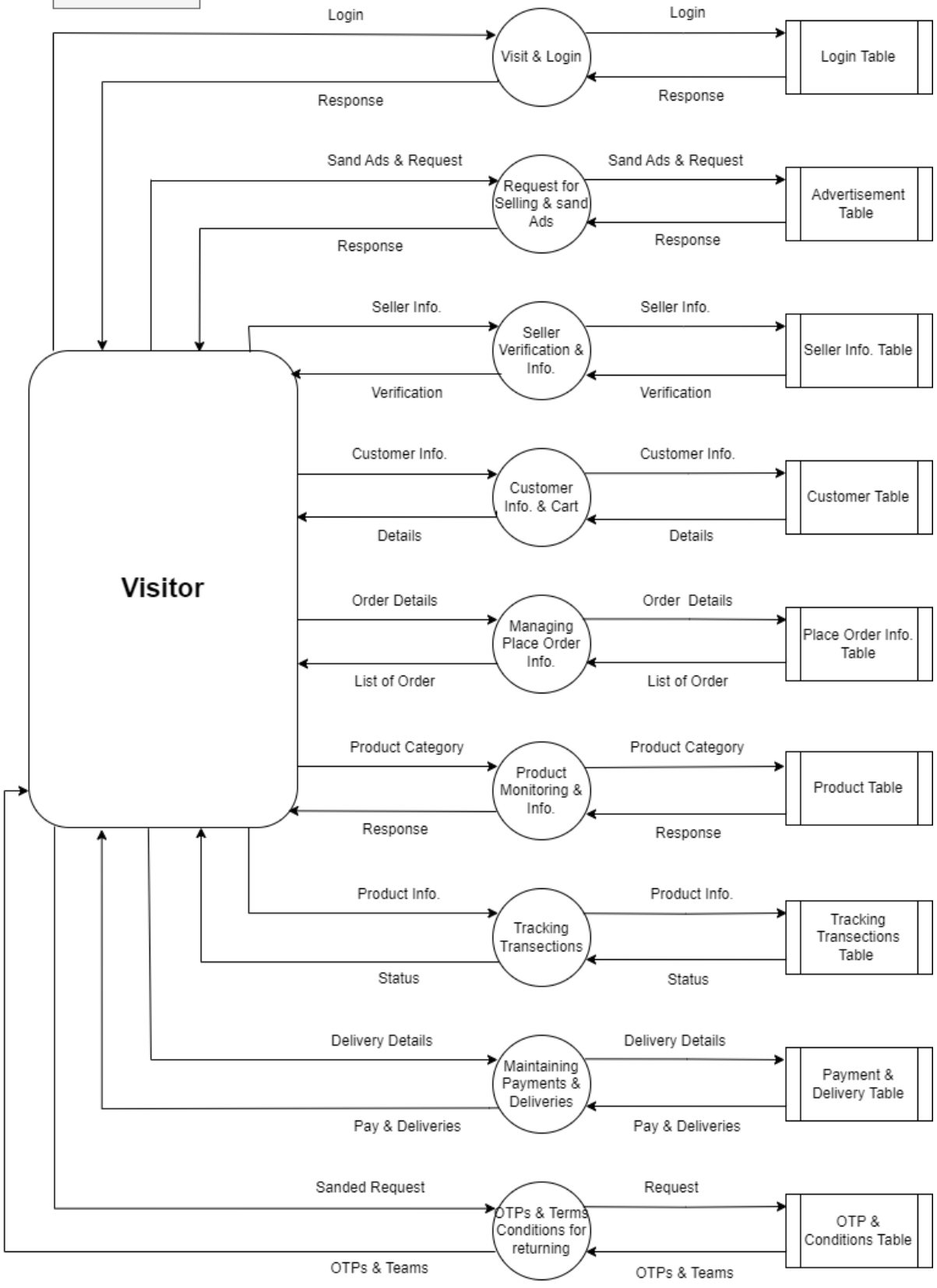
3.1 Level DFD: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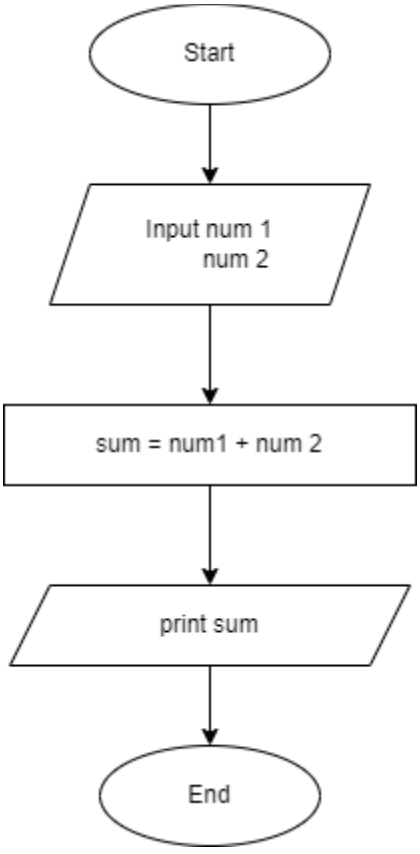
5. What is Flow chart? Create a flowchart to make addition of two numbers

- ✓ Flowchart is graphical or diagrammatical representation of sequence of any problem to be solved by computer programming language.
- ✓ Flowchart is a diagrammatic representation of an algorithm.
- ✓ The purpose of a flow chart is to provide people with a common language or reference point when dealing with a project or process.
- ✓ Flow charts are generally drawn in the early stages of formulating computer solutions. Flowcharts facilitate communication between programmers and business people.

Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectagle represents a process
	Decision	A diamond indicates a decision

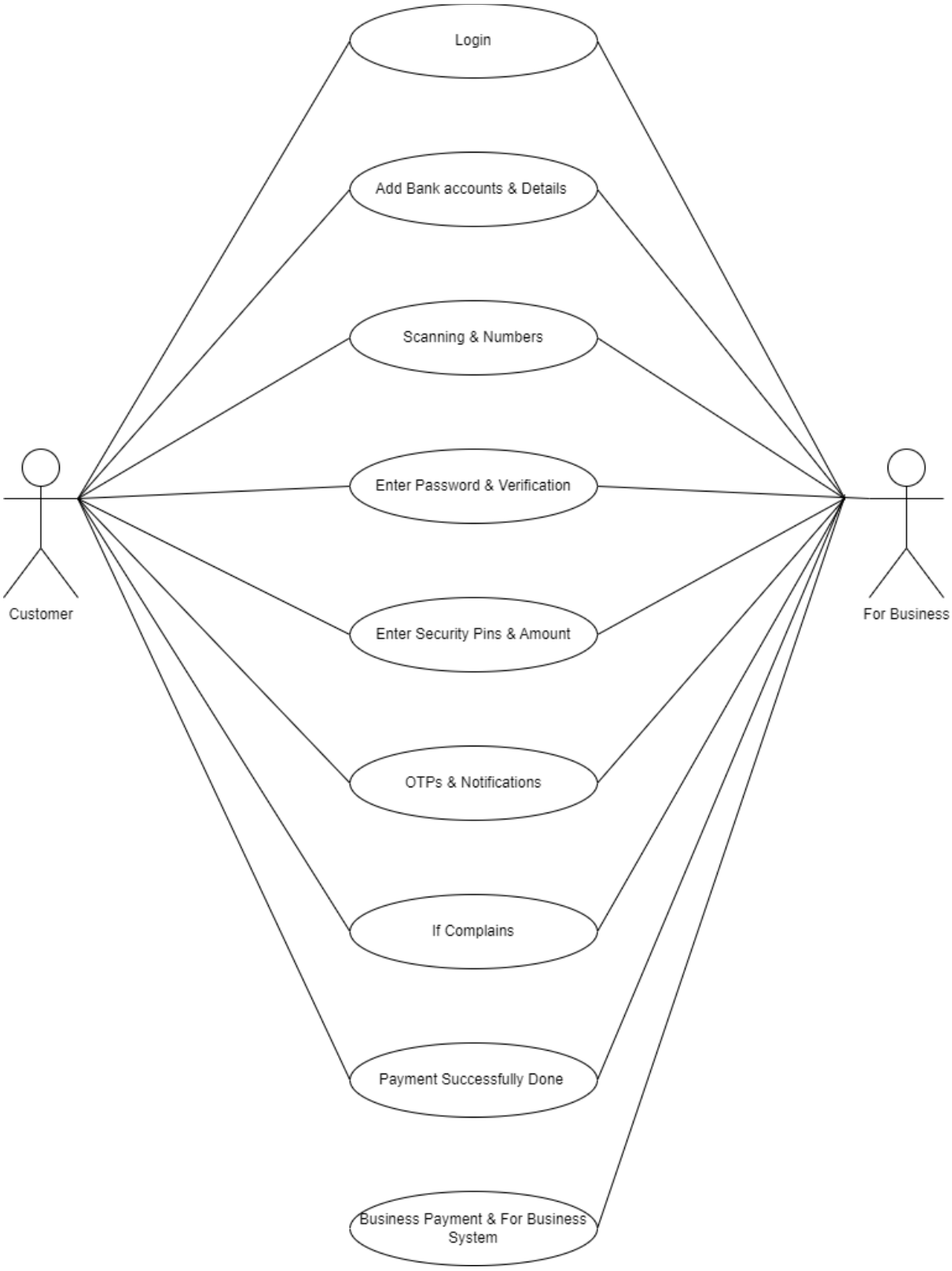
➢ Flowchart of addition of two Numbers



6. What is Use case Diagram? Create a use-case on bill payment on Paytm.

- ✓ The Use-Case Diagram is used to prepare, present and understand functional requirements of the system.
- ✓ Use cases represent the different ways in which a system can be used by the users.
- ✓ The purpose of use case is to define the logical behaviour of the system without knowing the internal structure of it.
- ✓ Use case model in UML provides system behaviour.
- ✓ UML describes "who can do what in a system".
- ✓ A use case represents a sequence of interactions between the user and the system.

➢ **Bill Payment Use Case Diagram**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OTPs & Notifications
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Business Payment & For Business System
Customer
For Business