Software Engineering

Assignment MODULE : 1

SE – Overview of IT Industry

1. What is software? What is software engineering?

- Software is a set of instructions ,data or programs used to operate computer and execute specific tasks.

- Software is a generic term used to refer to applications,scripts and programs that run on a device.

- Software Engineering is the process of designing, developing, testing, and maintaining software.

- It is a systematic and disciplined approach to software development that aims to create high-quality, reliable, and maintainable software.

2. Explain types of software ?

➢ The two main categories of software are application software and system software.

➢ An application is software that fulfills a specific need or performs tasks and System software is designed to run a computer's hardware .

Below are the types of software with examples :-

1. Operating System Software:
- An operating system (OS) manages hardware resources and provides a user interface.
- Examples: Microsoft Windows, Linux, Android, iOS.

2. Application Software:
   ● Application software serves specific purposes for end-users, such as productivity, entertainment, communication, and more.
   ● Examples: Microsoft Office (Word, Excel, PowerPoint), Spotify, Zoom

3. Utility Software:
   ● Utility software enhances the computer's performance, security, and management by performing maintenance tasks.
   ● Examples: Antivirus software (Norton, McAfee), Disk Cleanup .

4. Programming Software:
   ● Programming software assists developers in creating, debugging, and managing code.
   ● Examples: Integrated Development Environments (IDEs) like Visual Studio.

5. Open Source Software:
   ● Open source software is developed collaboratively and its source code is accessible to the public, fostering community-driven innovation.
   ● Examples: Linux Kernel, Mozilla Firefox.

3. What is SDLC ? Explain each phase of SDLC.

   ➢ SDLC is a process followed for software building within a software organization.
   ➢ Software development life cycle (SDLC) is a structured process that is used to design, develop, and test good-quality software.

The 7 Phases Of SDLC (Software Development Life Cycle)

Stage 1: Planning :-   planning is a vital role in the software delivery lifecycle since this is the part where the team estimates the cost and defines the requirements of the new software.

Stage 2: Gathering Requirements & Analysis :- The second step of SDLC is gathering maximum information from the client requirements for the product. Discuss each detail and specification of the product with the customer.

➢ The development team will then analyze the requirements keeping the design and code of the software in mind.

Stage 3: Design :- Once the developer decides on the best design approach, he then selects the program languages like Oracle, java , etc., that will suit the software.

Stage 4: Coding or Implementation :- This stage is considered to be one of the longest in SDLC.

➢ The developers need certain predefined coding guidelines, and programming tools like interpreters, compilers, debugger to implement the code.

Stage 5: Testing :- Once the developers build the software, then it is deployed in the testing environment. Then the testing team tests the functionality of the entire system.
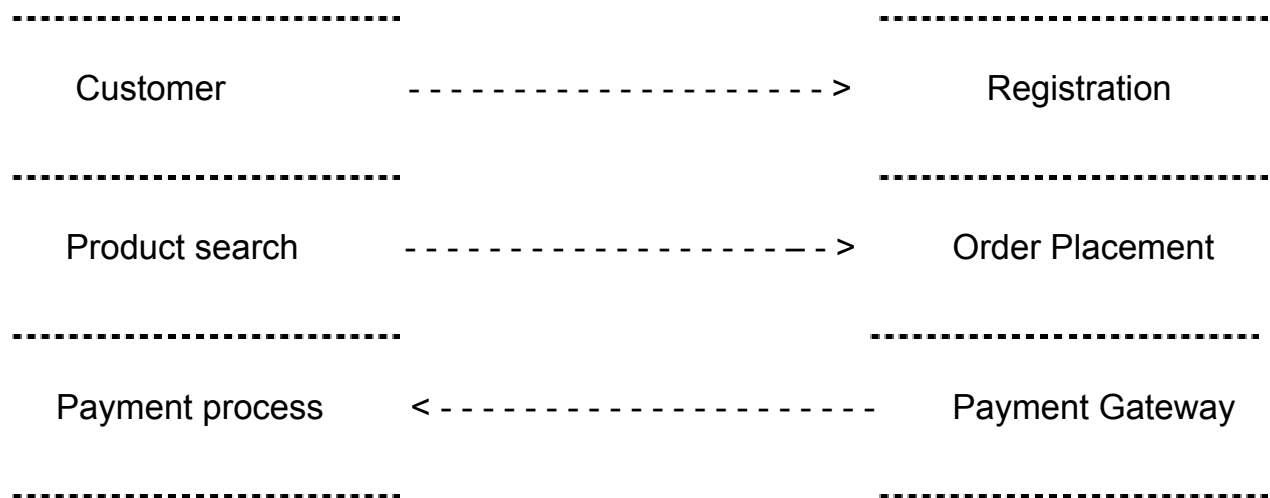
Stage 6: Deployment :- Once the testing is done, and the product is [ready for deployment](), it is released for customers to use.

Stage 7: Maintenance :- Maintenance is the seventh phase of SDLC where the developed product is taken care of. According to the changing user end environment or technology, the software is updated timely.

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

➢ Data Flow Diagram (DFD) represents the flow of data within information systems.
➢ Data Flow Diagrams (DFD) provide a graphical representation of the data flow of a system that can be understood by both technical and non-technical users.

Flipkart DFD :-

```
..............................                    ..............................

    Customer         - - - - - - - - - - - - - - - - - - >        Registration

..............................                    ..............................

  Product search     - - - - - - - - - - - - - - - - — - >      Order Placement

..............................                    ..............................

  Payment process    < - - - - - - - - - - - - - - - - - - -      Payment Gateway

..............................                    ..............................
```
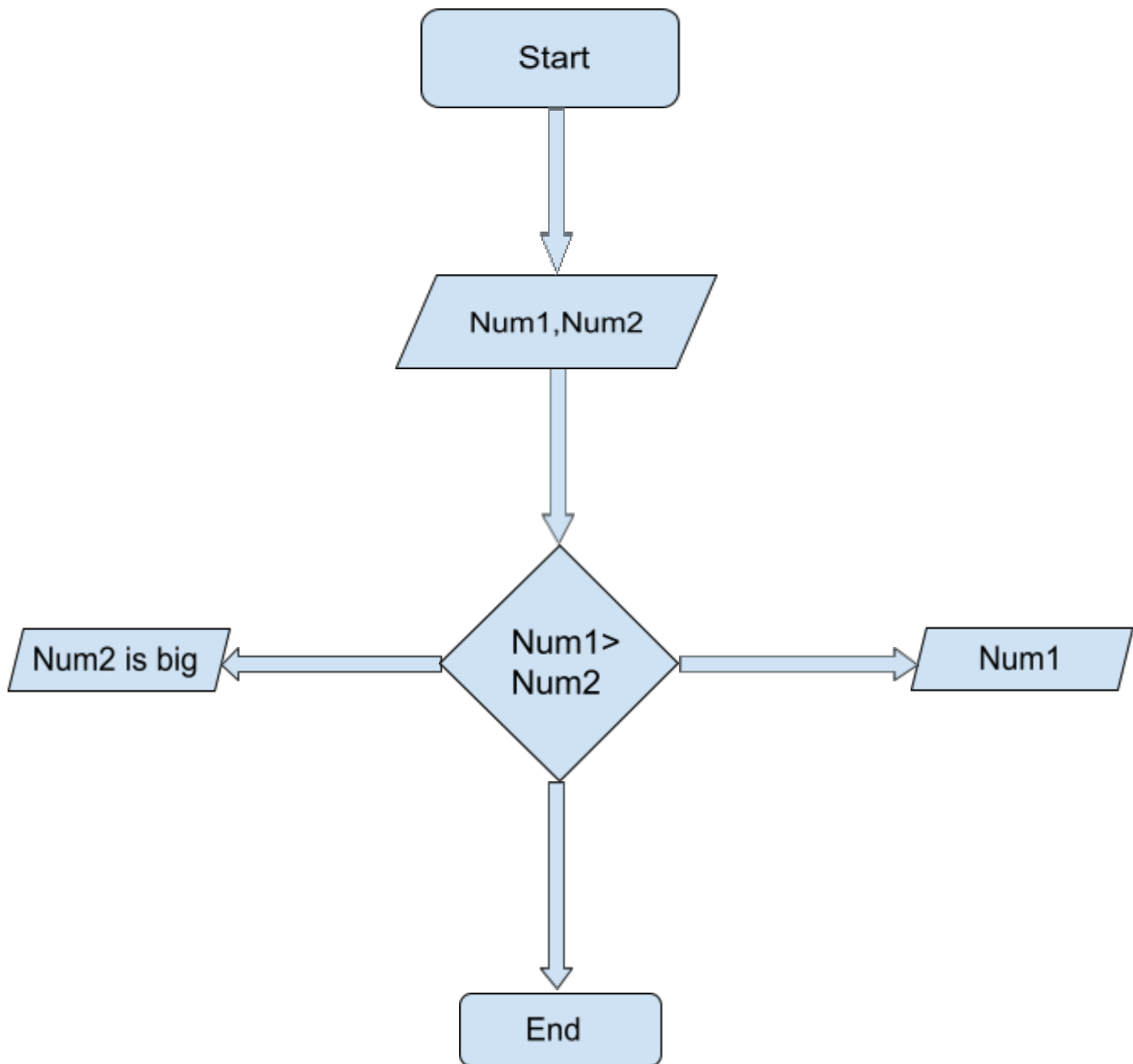
5. What is Flow chart? Create a flowchart to make addition of two numbers.

➢ A flowchart is a type of diagram that represents a workflow or process.
➢ A flowchart can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task.
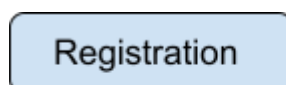
Flowchart of two numbers :

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │
                           ▼
                   ╱─────────────╲
                  ╱ Num1,Num2     ╱
                 ╱───────────────╱
                          │
                          ▼
                        ╱╲
                       ╱  ╲
  ╱───────────╲      ╱      ╲      ╱─────────╲
 ╱ Num2 is big ◄───── Num1>   ─────►  Num1   ╱
╱─────────────╱      ╲ Num2  ╱      ╱────────╱
                      ╲    ╱
                       ╲  ╱
                        ╲╱
                         │
                         ▼
                  ┌─────────────┐
                  │    End      │
                  └─────────────┘
```
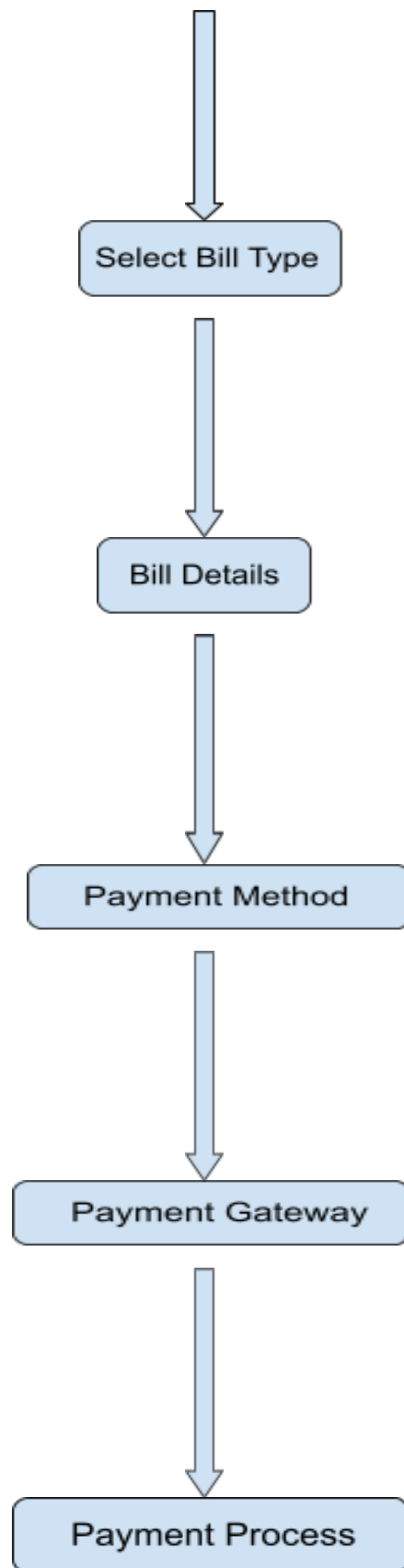
6. what is use case Diagram? Create a use-case on bill payment on paytm.

➢ A Use Case Diagram is a vital tool in system design, it provides a visual representation of how users interact with a system.

Use - case Diagram :

┌─────────────────┐
│ Registration   │
└─────────────────┘

```
          │
          ▼
   ┌──────────────┐
   │ Select Bill Type │
   └──────────────┘
          │
          ▼
   ┌──────────────┐
   │  Bill Details  │
   └──────────────┘
          │
          ▼
   ┌──────────────┐
   │ Payment Method │
   └──────────────┘
          │
          ▼
   ┌──────────────┐
   │ Payment Gateway │
   └──────────────┘
          │
          ▼
   ┌──────────────┐
   │ Payment Process │
   └──────────────┘
```

Payment confirmation