MODULE: 1

1. What is software?

Software is a set of instructions, data, or programs used to operate a computer and execute specific tasks. In simpler terms, software tells a computer how to function.

• What is software engineering?

Software engineering is a branch of engineering that deals with the development of software products.
In which we study about design, development and maintenance of software.

2. Explain the types of software?

Mainly there are two types of software:

i. **System software:** These software programs are designed to run a computer's application programs and hardware. System software sits between the computer hardware and the application software. Users do not interact directly with system software as it runs in the background, handling the basic functions of the computer. It controls the operations of the computer hardware and provides an environment or platform for all the other types of software to work in. The OS is the best example of system software it manages all the other computer programs. Therefore system software is an essential part of your computer system. They are the first thing that gets loaded in the system's memory wherever you turn on your computer. System software is also known as "low-level software" because the end-users do not operate them.

ii. **Application software**: The most common type of software, application software is a computer software package that performs a specific function for a user, or in some cases, for another application. An application can be self-contained, or it can be a group of programs that run the application for the user. Examples of modern applications include graphics software, web browsers, playing games, word processors, software development tools, image editors and communication platforms.

Some of major application software which are available in market:

• **Word processors**: Applications used for documentation. Examples include Microsoft Word, Google Docs, and AppleWorks

• **Spreadsheet software**: Software used to compute quantitative data. Examples include Microsoft Excel, Google Sheets, and Quattro Pro.

- **Database software**: Software used to create and manage a database to organize data. This is also known as database management software .

- **Multimedia software**: Tools that are able play, create, or record images, audio, or video files. It's used for video editing, animation, graphics, and image editing. Examples include Adobe Photoshop and Picasa.

- **Application suites**: A collection of related programs sold as a package. Microsoft Office is the most widely used application suite.

- **Internet browsers**: Software used to access and view websites. Examples include Google Chrome and Internet Explorer.

- **Email programs**: Software used for emailing. Examples include Gmail.

3. What is SDLC? Explain each phase of SDLC

SDLC stands for Software Development Life Cycle.

A software life cycle model (also termed process model) is a pictorial and diagrammatic representation of the software life cycle. A life cycle model represents all the methods required to make a software product transit through its life cycle stages. It also captures the structure in which these methods are to be undertaken.

In other words, a life cycle model maps the various activities performed on a software product from its inception to retirement.

- **Phase of SDLC:**
  Phase 1: Planning and requirement analysis.

  The requirement is the first stage in the SDLC process. The senior members of the team perform it with inputs from all the stakeholders and domain experts or SMEs in the industry.
  This stage gives a clearer picture of the scope of the entire project and the anticipated issues, opportunities, and directives which triggered the project.
  Business Index and Projector conducted a meeting with the customers in which all the data was collected such as what the customer wanted to build, who would be the end user, what was the purpose of the product. Before making any product a basic understanding or knowledge of the product is very essential.

  For Example: A client wants to have an application which concerns money transactions. In this method, the requirement has to be precise like what kind of operations will be done, how it will be done, in which currency it will be done, etc.

  Once the requirement is understood, the SRS (Software Requirement Specification) document is created. The developers should thoroughly follow this document and also should be reviewed by the customer for future reference.

  Phase 2: **Defining Requirements.**
  Once the requirement analysis phase is completed the next SDLC step is to define and document software needs. This process conducted with the help of 'Software Requirement Specification'

document also known as 'SRS' document. It includes everything which should be designed and developed during the project life cycle.

Phase 3: Designing.

In this third phase, the system and software design documents are prepared as per the requirement specification document. This helps define overall system architecture.

There are two kinds of design documents developed in this phase:
1) High-Level Design (HLD).
2) Low-Level Design (LLD).

Phase 4: Coding.

Once the system design phase is over, the next phase is coding. In this phase, developers start build the entire system by writing   code using the chosen programming language. In the coding phase, tasks are divided into units or modules and assigned the various developers. It is the longest phase of the Software Development Life Cycle process.

In this phase, Developer needs to follow certain predefined coding guidelines. They also need to use programming tools like compiler, interpreters, debugger to generate and implement the code.

Phase 5: Testing.

Once the code is generated, and it is deployed in the testing environment. The testing team starts testing the functionality of the entire system. This is done to verify that the entire application works according to the customer requirement.

During this phase, QA and testing team may find some bugs/defects which they communicate to developers. The development team fixes the bug and send back to QA for a re-test. This process continues until the software is bug-free, stable, and working according to the business needs of that system.

Phase 6: Deployed.

Once the software testing phase is over and no bugs or errors left in the system then the final deployment process starts. Based on the feedback given by the project manager, the final software is released and checked for deployment issues if any.

Phase 7: Maintenance.

Once the system is deployed, and customers start using the developed system, following 3 activities occur.

Bug fixing – Bugs are reported because of some scenarios which are not tested at all
Upgrade – Upgrading the application to the newer versions of the Software
Enhancement – Adding some new features into the existing software

4. What is DFD?

DFD (Data Flow Diagram)
A data flow diagram (DFD) is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement. They are often elements of a formal methodology such as Structured Systems Analysis.
It shows how data enter and leaves the system, what changes the information, and where data is stored.

- Create a DFD diagram on Flipkart.

5. What is Flow chart?

Flowchart is a diagrammatic representation of sequence of logical steps of a program. Flowcharts use simple geometric shapes to depict processes and arrows to show relationships and process/data flow.

- Create a Flowchart to make Addition of two number.

6. What is Use case Diagram?

A use case diagram is a way to summarize details of a system and the users within that system. It is generally shown as a graphic depiction of interactions among different elements in a system. Use case diagrams will specify the events in a system and how those events flow, however, use case diagram does not describe how those events are implemented.

- Create a use-case on bill payment on paytm.