Mern stack Assignment

Software Engineering Assignment

MODULE: 1(SDLC)

Q-1. What is software? What is software engineering?

Ans:- Software is a collection of codes, documents, and triggers that does a specific job and fills a specific requirement.

* Software is a set of instructions, data or programs used to operate computers and execute specific tasks. It is the opposite of hardware, which describes the physical aspects of a computer. Software is a generic term used to refer to applications, [scripts](https://www.techtarget.com/whatis/definition/script) and programs that run on a device. It can be thought of as the variable part of a computer, while hardware is the invariable part.

(2). What is software engineering?

* Engineering is the development of products using best practices, principles, and methods.
* Software engineering is the process of developing, testing and deploying computer applications to solve real-world problems by adhering to a set of engineering principles and best practices

Q-2. Explain types of software?

Ans:- E.X: 1.APPLICATION SOFTWARE

2. SYSTEM SOFTWARE

3. DRIVER SOFTWARE (AUDIO VIDEO)

4. MIDDLEWARE

5. PROGRAMING SOFTWARE

Details:-

* **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](https://www.techtarget.com/searchcio/feature/The-rise-of-modern-applications-Why-you-need-them) include office suites, graphics software, databases and database management programs, web browsers, word processors, software development tools, image editors and communication platforms.
* **System software.** These software programs are designed to run a computer's application programs and hardware. System software coordinates the activities and functions of the hardware and software. In addition, 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. Other examples of system software include the [firmware](https://www.techtarget.com/whatis/definition/firmware), computer language translators and system [utilities](https://www.techtarget.com/whatis/definition/utility).
* **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.
* **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.
* **Programming software.** Computer programmers use programming software to write code. Programming software and programming tools enable developers to develop, write, test and [debug](https://www.techtarget.com/searchsoftwarequality/definition/debugging) other software programs. Examples of programming software include assemblers, compilers, debuggers and interpreters.

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

Ans:- The software development lifecycle (SDLC) is the cost-effective and time-efficient process that development teams use to design and build high-quality software. The goal of SDLC is to minimize project risks through forward planning so that software meets customer expectations during production and beyond.

* SDLS IS A (SOFTWARE DEVELOPMENT LIFE CYCLE) IS A BIG-PICTURE BREAKDOWN OF ALL THE STEPS INVOLVED IN SOFTWARE CREATION. EX:-1.PLANNING 2. ANALYSIS 3. DESIGNING 4. IMPLEMENTATION 5. TESTING 6. MAINTENANCE

**1) Requirement Gathering and Analysis**

* + During this 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.

**For Example:-**  A customer wants to have an application which involves money transactions. In this case, the requirement has to be clear like what kind of transactions will be done, how it will be done, in which currency it will be done, etc.

1. Once the requirement gathering is done, an analysis is done to check the feasibility of the development of a product. In case of any ambiguity, a call is set up for further discussion.
2. Once the requirement is clearly understood, the SRS (Software Requirement Specification) document is created. This document should be thoroughly understood by the developers and also should be reviewed by the customer for future reference.

### 2) 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.
* High-level design (HLD): it gives the architecture of software products.
* Low- level design(LLD) : it describes how each and every feature in the product should work and every components.

### 3) Implementation or Coding

* Implementation/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.
* This is the longest phase in SDLC model.
* This phase consists of front end+ middleware + Backend .
* in front-end: Development of coding is done even SEO setting are done.
* in middleware: They connect both the front end and back end.
* in the back-end: A database is created.

### 4) 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.

### 5) Deployment

* Once the product is tested, it is deployed in the production environment or first [UAT (User Acceptance testing)](https://www.softwaretestinghelp.com/what-is-user-acceptance-testing-uat/) is done depending on the customer expectation.
* In the case of UAT, a replica of the production environment is created and the customer along with the developers does the testing. If the customer finds the application as expected, then sign off is provided by the customer to go live.

### 6) 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 developers.
* There are different methodologies that organizations can use to implement the SDLC, such as Waterfall, agile,Scrum, V-model and Devops.

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

Ans:- A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. Data flowcharts can range from simple, even hand-drawn process overviews, to in-depth, multi-level DFDs that dig progressively deeper into how the data is handled.

#### 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.

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

Ans:- A flowchart is a visual representation of the sequence of steps and decisions needed to perform a process. Each step in the sequence is noted within a diagram shape. Steps are linked by connecting lines and directional arrows. This allows anyone to view the flowchart and logically follow the process from beginning to end.

* A flowchart is a powerful business tool. With proper design and construction, it communicates the steps in a process very effectively and efficiently.
* A flow chart is a graphical or symbolic representation of a process. Each step in the process is represented by a different symbol and contains a short description of the process step. The flow chart symbols are linked together with arrows showing the process flow direction.

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

Ans:- A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.