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B-5 AI&ML SEM-5

Assignment-1

Q.1)What is Object Oriented Analysis and Design Software Development Life Cycle? Briefly explain that.

The object-oriented life cycle model considers 'objects' as the basis of the software engineering process. The development team starts by observing and analyzing the system they intend to develop before defining the requirements. Once the process is over, they focus on identifying the objects of the system. Now, an object could be anything; it can have a physical existence like a customer, car, etc. An object also constitutes intangible elements like a process or a project.

It's a structured method for analyzing, designing a system by applying the object-orientated concepts, and developing a set of graphical system models during the development life cycle of the software.

OOAD In The SDLC :

The software life cycle is typically divided up into stages going from abstract descriptions of the problem to designs then to code and testing and finally to deployment.

The earliest stages of this process are analysis (requirements) and design.

In analysis developers work with users and domain experts to define what the system is supposed to do. Implementation details are supposed to be mostly or totally ignored at this phase.

The goal of the analysis phase is to create a model of the system regardless of constraints such as appropriate technology. This is typically done via use cases and *abstract* definition of the most important objects using conceptual models.

The design phase refines the analysis model and applies the needed technology and other implementation constraints.

It focuses on describing the objects, their attributes, behavior, and interactions. The design model should have all the details required so that programmers can implement the design in code.

Q.2)What is UML? Describe the building blocks of it.

Unified Modeling Language (UML) is a general purpose modelling language. The main aim of UML is to define a standard way to visualize the way a system has been designed. It is quite similar to blueprints used in other fields of engineering.

UML is not a programming language, it is rather a visual language. We use UML diagrams to portray the behavior and structure of a system. UML helps software engineers, businessmen and system architects with modelling, design and analysis.

UML is composed of three main building blocks, i.e., things, relationships, and diagrams. Building blocks generate one complete UML model diagram by rotating around several different blocks. It plays an essential role in developing UML diagrams. The basic UML building blocks are:

1.)Things: Anything that is a real world entity or object is termed as things. It can be divided into several different categories:

- Structural things
- Behavioral things
- Grouping things
- Annotational things

2.)Relationships : It illustrates the meaningful connections between things. It shows the association between the entities and defines the functionality of an application.

There are four types of relationships given below:

- Dependency
- Association
- Generalization
- Realization

3.)Diagrams : The diagrams are the graphical implementation of the models that incorporate symbols and text. Each symbol has a different meaning in the context of the UML diagram. There are thirteen different types of UML diagrams that are available in UML 2.0, such that each diagram has its own set of symbols. And each diagram manifests a different dimension, perspective, and view of the system.

UML diagrams are classified into three categories that are given below:

- Structural Diagram
- Behavioral Diagram
- Interaction Diagram

Q.3)Describe the following terms with examples

A) Inception : The first phase of the Rational Unified Process that deals with the original conceptualization and beginning of the project.

B) Elaboration : The second phase of the Rational Unified Process that allows for additional project planning including the iterations of the construction phase.

C) Composition : Composition is a specialized form of aggregation. In composition, if the parent object is destroyed, then the child objects also cease to exist. Composition is actually a strong type of aggregation and is sometimes referred to as a “death” relationship. As an example, a house may be composed of one or more rooms. If the house is destroyed, then all of the rooms that are part of the house are also destroyed.

D) Aggregation : Aggregation is a specialized form of association between two or more objects in which each object has its own life cycle but there exists an ownership as well. Aggregation is a typical whole/part or parent/child relationship but it may or may not denote physical containment. An essential property of an aggregation relationship is that the whole or parent (i.e. the owner) can exist without the part or child and vice versa.