LOW LEVEL DESIGN

Introduction:

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms.

LLD, also known as a detailed design, is used to design internals of the individual modules identified during HLD . data structures and algorithms of the modules are designed and documented. LLD describes each and every module in an elaborate manner so that the programmer can directly code the program based on it.

During the detailed phase the logical and functional design is done and the design of application structure is developed during the high-level design phase. Detailed design is the phase where the design is refined and plans, specifications and estimates are created. Detailed design will include outputs such as 2D and 3D models, P & ID's, cost build up estimates, procurement plans etc. This phase is where the full cost of the project is identified.

Low-level is a step by step refinement process. The main goal of low-level design is to design the internal logical design for code. After that, it is easy to understand internal low-level design architecture.

Resources for LLD:

- Head first object-oriented analysis and design.
- Head first design patterns.
- Clean Code.
- Clean Architecture.
- Refactoring: Improving the Design of Existing Code.
- Patterns of Enterprise Application Architecture.
- Design Patterns: Elements of Reusable Object-Oriented Software.

Purpose of Low Level Design:

- The goal of LLD or a low-level design document (LLDD) is to give the internal logical design of the actual program code. Low-level design is created based on the high-level design.

- The aim of the detailed design is to furnish a description of a system that achieves the goal of the conceptual system design requirements.

- LLD describes the class diagrams with the methods and relations between classes and program specs. It describes the modules so that the programmer can directly code the program from the document.

- A good low-level design document makes the program easy to develop when proper analysis is utilized to create a low-level design document.

- The code can then be developed directly from the low-level design document with minimal debugging and testing.
- Other advantages include lower cost and easier maintenance.
- Is at the lowest level of abstraction before the code itself and clearly define the methods, their parameters return types and interaction with dependencies.
- Is used as program specification by the developers to develop the code for the subsystem that the LLD is written for.

Convert Low Level Design Into Programs:

The LLD phase is the stage where the actual software components are designed. During the detailed phase the logical and functional design is done and the design of application structure is developed during the high-level design phase.

Difference between HLD and LLD:

- The HLD changes the client or business requirement into a high-level solution.
- The LLD changes the high-level solution to a comprehensive solution.
- The high-level design is necessary to understand the flow across several system objects.