- Computational thinking refers to formulating a solution of a problem. There are several techniques for computational thinking: Abstraction, decomposition, algorithms, pattern recognition

Abstraction

- The process of extracting information that is essential, ignoring irrelevant info/data.

Benefits

- The time required to develop the program reduces so the program can be delivered to the customer more quickly
- The program is smaller in size, taking up less size in memory.
- Download times are shortened
- Customer satisfaction is greater, since requirements are met without any extraneous features.
- Helps in developing simplified models of programs

Producing Abstract Model

Step 1: Identify purpose of the model to be produced.

Step 2: Identify sources of information

Step 3: Use the relevant information from appropriate sources that would fullfill the purpose.

E.g: Road, Rail line maps, timetable

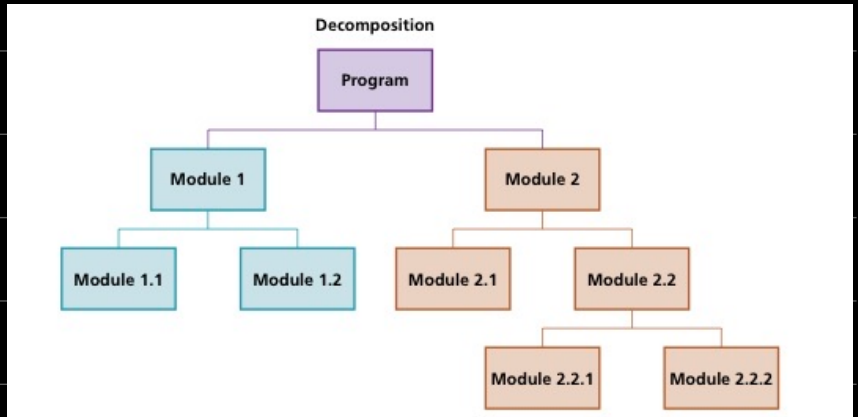
Decomposition

Def: The process of breaking a complex problem into smaller parts until it is understandable and easy to solve.

- A complex problem is divided into smaller parts which is further subdivided into even more smaller parts.
- Produces manageable self-contained modules.

- Decomposition results in formation of modules which may be represented as procedures or functions

Pattern Recognition: The identification of parts of a problem that are similar and could use the same solution.



▲ **Figure 9.2** Decomposition of a program into modules