



Assignment : 01

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Q: What is Z specification, why it is use for, also give Example.

Ans: Z specification: The Z notation / zEd / is a formal specification language used for describing and modeling computing systems. It is targeted at the clear specification of computer programs and computer-based systems. In general, Z specification cannot be interpreted or compiled into a running program (or prototype) Z is not a programming. Z is a model-based notation. In Z you usually model a system a system by representing its state- a collection of state variable and their values- and some operations that can change its state. A model that is characterized by the operation it describes is called an abstract date type (ADP). Z was designed for people, not machines. Z based on the standard

mathematical notation used in axiomatic set theory, lambda calculus and first-order predicate logic. All expressions in notation are typed, thereby avoiding some of the paradoxes of naïve set theory. Z contains a standard catalogue (called the mathematical toolkit) of commonly used mathematical functions and predicates, defined using Z itself.

Why Z ?

- Expressive power.
- Precise formalism.
- Can be used to model a broad range of systems.
- Accuracy important for safety-critical systems.

Example: Banking System

With draw Money

Bank Account

Dollar Amount? : N

Cent Amount? : N

Dollar Amount? < dollars

Dollar Amount? = dollars \longrightarrow cent Amount? < cents

Cent Amount? > cents

\longrightarrow (dollar' = dollars - dollar Amount? - 1
 \wedge Cents' = cents - cent Amount? + 100)

Cent Amount? < cents

\longrightarrow (dollars' = dollars - dollar Amount?
 \wedge Cents' = cents - cent Amount?)