ASSIGNMENT

SOFTWARE VERIFICATION AND VALIDATION

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Q.1:- What is Z specification, why it is use for, also give Example.

Ans:- The Z notation /ˈzɛd/ is a formal specification language used for describing and modelling computing systems. It is targeted at the clear specification of computer programs and computer-based systems in general.

Z is based on the standard mathematical notation used in axiomatic set theory, lambda calculus, and first-order predicate logic. All expressions in Z notation are typed, thereby avoiding some of the paradoxes of naive set theory. Z contains a standardized catalogue of commonly used mathematical functions and predicates, defined using Z itself.

Z is a model oriented formal specification language based on Zermelo-Fränkel axiomatic set theory and first order predicate logic. It is a mathematical specification language, with the help of which natural language requirements can be converted into mathematical form.

Although Z notation (just like the APL language, long before it) uses many non-ASCII symbols, the specification includes suggestions for rendering the Z notation symbols in ASCII and in LaTeX. There are also Unicode encodings for all standard Z symbols

Example :- Banking System

```
┌─ WithdrawMoney ────────────────────────────────────
│ ΔBankAccount
│ dollarAmount? : ℕ
│ centAmount? : ℕ
├────────────────────────────────────────────────────
│ dollarAmount? ≤ dollars
│ dollarAmount? = dollars ⇒ centAmount? ≤ cents
│ centAmount? > cents
│   ⇒ (    dollars'  = dollars − dollarAmount? − 1
│      ∧ cents'    = cents − centAmount? + 100 )
│ centAmount? ≤ cents
│   ⇒ (    dollars'  = dollars − dollarAmount?
│      ∧ cents'    = cents − centAmount?      )
└────────────────────────────────────────────────────
```