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Panel C, Batch C1

TOC CCA 4 Assignment

Batch C1:

Ans1. 1. Finite Automata (FA):

Language: Regular languages such as the set of all strings with an even number of 0's.

Computational Problem: Checking if a given string belongs to a regular language.

for eg: A set of all strings over {0,1} that end with '01'

2. Pushdown Automata (PDA):

Language: Context free langs. lik the set of balanced parentheses.

Computational problem: Parsing arithmetic expression or checking synthentic correctness of code.

eg: set of all string over (a, b) with equal no.'s of a's and b's.

3. Turing Machine (TM):

Language: Recursively enumerable languages such as set of all halting turing machines.

Problem: solving undecidable problems like the halting problem or simulating other turing machines.

ex: set of all palindromes over {0, 1}.

Ans 2. Yes, software verification and program analysis can be facilitated by concepts from Automata theory. They provide foundational principles for modelling and analyzing computational processes, essential for tasks like program verification, static analysis and parsing.

Pawleej
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Ans 3. Network flow theory influences the efficiency of system like the internet and power grids by optimizing resource flow. However as system grow, computational complexities increase, demanding, scalable solution for efficient operation.