RGPV 2010 Q. Write short note on automaton?

Ans. An automaton is an abstract self-propelled computing device which follows a predetermined sequence of operations automatically.

There are four major families of automaton :

- 1. Finite-state machine.
- 2. Pushdown automata.
- 3. Linear-bounded automata.
- 4. Turing machine.

1. Finite-state machine: A system where particular inputs cause particular changes in state can be represented using finite state machines. In it a state machine will read a series of inputs. When it reads an input, it will switch to a different state. Each state specifies which state to switch to, for a given input.



2. Pushdown automata: Pushdown automata are nondeterministic finite state machines augmented with additional memory in the form of a stack.



3. Linear-bounded automata: A linear bounded automaton is a nondeterministic Turing machine that satisfies the following three conditions:

- 1. Its input alphabet includes two special symbols, serving as left and right endmarkers.
- 2. Its transitions may not print other symbols over the endmarkers.
- 3. Its transitions may neither move to the left of the left endmarker nor to the right of the right endmarker.



4. Turing Machine: A Turing Machine is an accepting device which accepts the languages (recursively enumerable set) generated by type 0 grammars.

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