

Artificial Intelligence

Script

- Entry Condition

→ Result

- props

- Roles

- Track

→ Scenes

→ This is another KR structure.
Stereotype of events sequence in particular Context

→ Role → Place → Specific Different tracks of

Script - Restaurant

Task : Coffee Shop

Props : Table

food
check
money

Roles : Customer

Waiter
Cook
Cashier
Owner

Entry Condition :

Customer is hungry
Customer has money.

Results :

Customer has less money.

Owner has more money

Customer is not hungry

Customer is pleased.

Scene -1 Entering

1) Customer entering to the coffee shop

Scene 2 - ordering

- Customer asks for menu.
→ waiter brings it.
→ customer orders the food

Scene - 3 → Eating

Scene - 4 → Exit

Natural Language Processing (NLP)

- Morphological Analysis
→ Syntactic Analysis
→ Semantic Analysis
→ ~~Discourse~~ Discourse Integration
→ Pragmatic Analysis.

Morphological Analysis

- Individual words are analysed into their components & nonword token such as punctuation are separated from words

Syntactic

Linear sequence of words are transformed into structure that show how words relate to each other

- Some words maybe rejected if they don't follow grammar rule

Semantic

- The structure created by syntactic analyser meaning in other words
- are assigned
- a mapping is made, ~~between~~ the syntactic structure & object in task domain
- A structure of no mapping is neglected
- (means meaningless structures are rejected)

Discourse

→ The meaning of sentence may depend on preceding sentence + will influence sentence that follows it.

Pragmatic

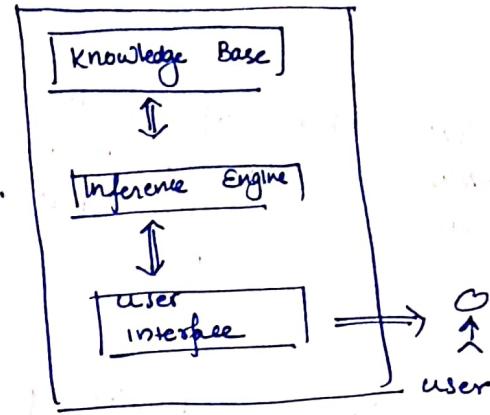
→ The structure representing what was said is interpreted to know what was actually meant.

Expert System (Tutorial point)

- Computer application developed to solve complex problems in particular domain
(eg of domain science, medical etc)
- Characteristics
 - * High performance
 - * ~~understandable~~ understandable.
 - * Reliable
 - * Highly responsible.
- Capable of advising, instructing + assist in decision making, deriving solution, diagnosing, explaining, interpreting inputs, predicting results, justifying conclusions, suggesting alternative solution to a problem, substituting human decision making.

Components of Expert System

- Knowledge Base
 - Inference Engine
 - User interface.
- Human expert $\xrightarrow{\text{Knowledge Base}}$ Knowledge Engine



→ knowledge is required to exhibit intelligence

→ KB → CRI

Application

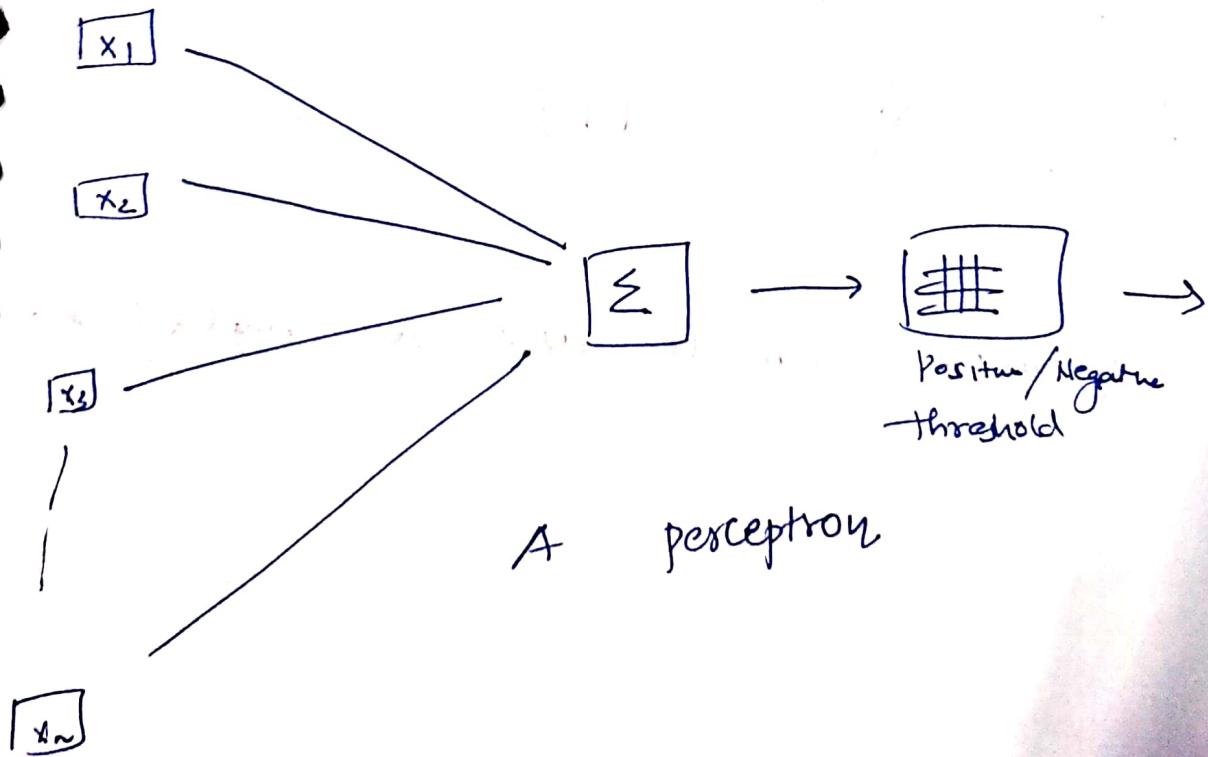
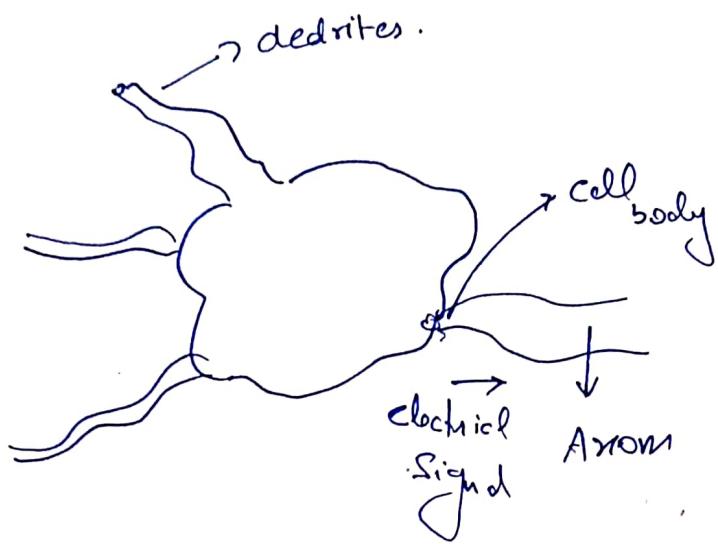
- Design Domain
- Medical Domain
- Monitoring System
- Knowledge Domain
- financial / commerce

AI
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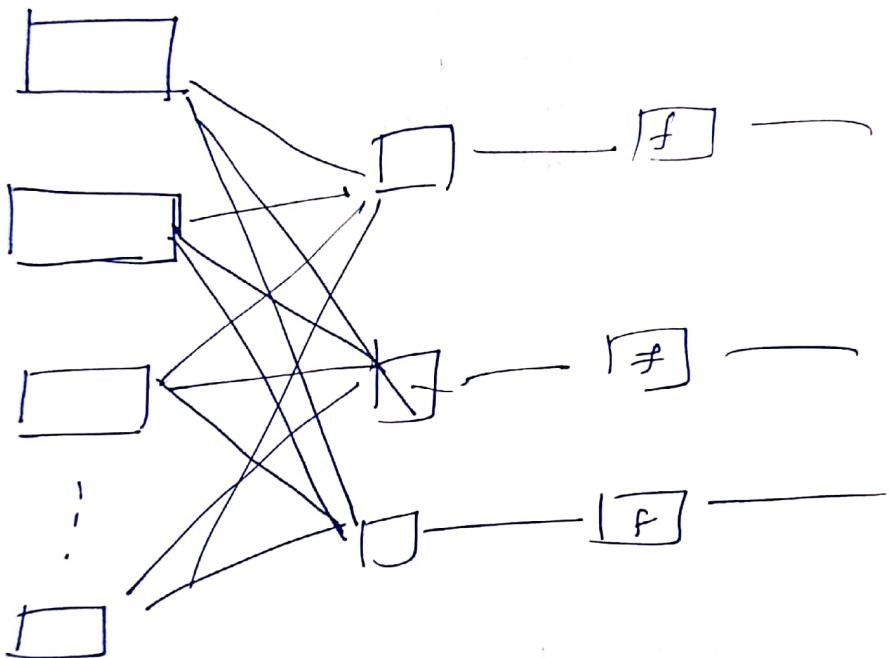
learning

Neural

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→ perceptron calculates binary operation of



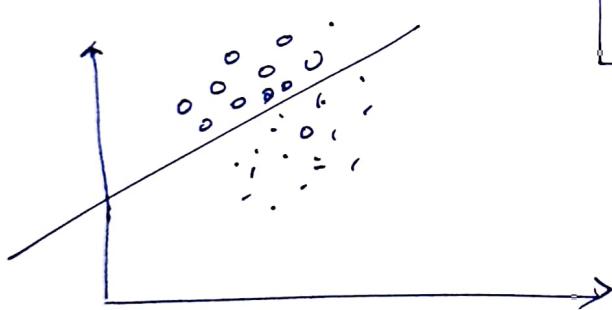
Several perceptrons can be used to complex function



$$g(x) = \sum_{i=0}^n w_i x_i$$

$$\sigma(x) = \begin{cases} 1 & \text{if } g(x) > 0 \\ 0 & \text{if } g(x) \leq 0 \end{cases}$$

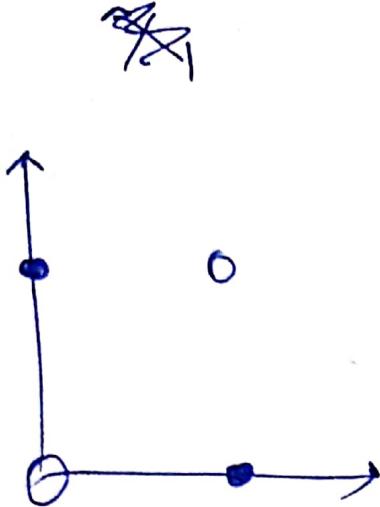
$g(x) = w_0 + w_1 x_1 + w_2 x_2 + \dots$



Linearly Separable



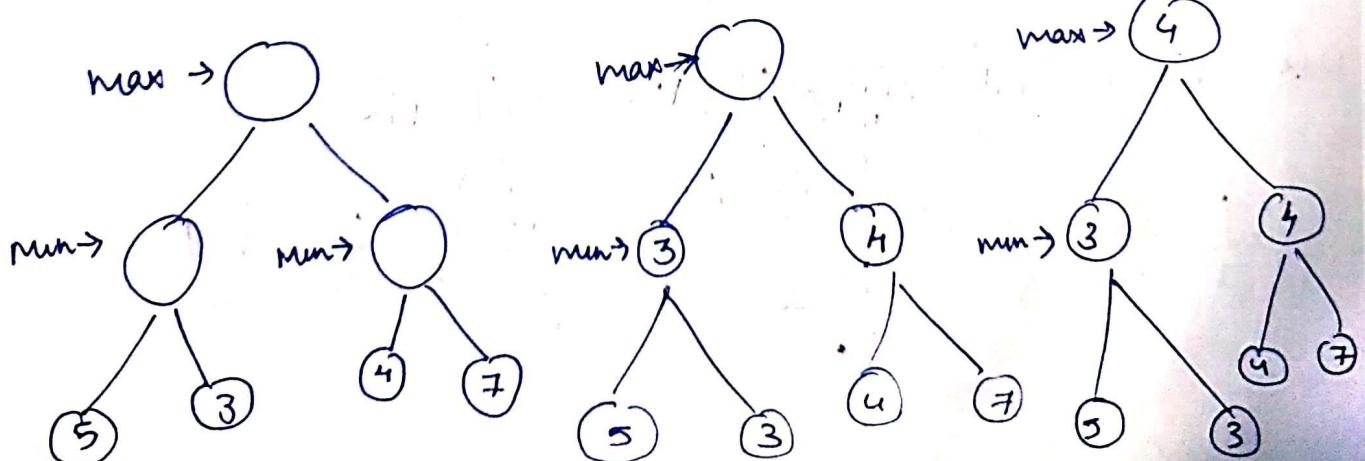
x_1	x_2	x_1	x_{OR}	x_2
0	0	0	0	0
0	1	1	1	1
1	0	1	1	0
1	1	1	1	1



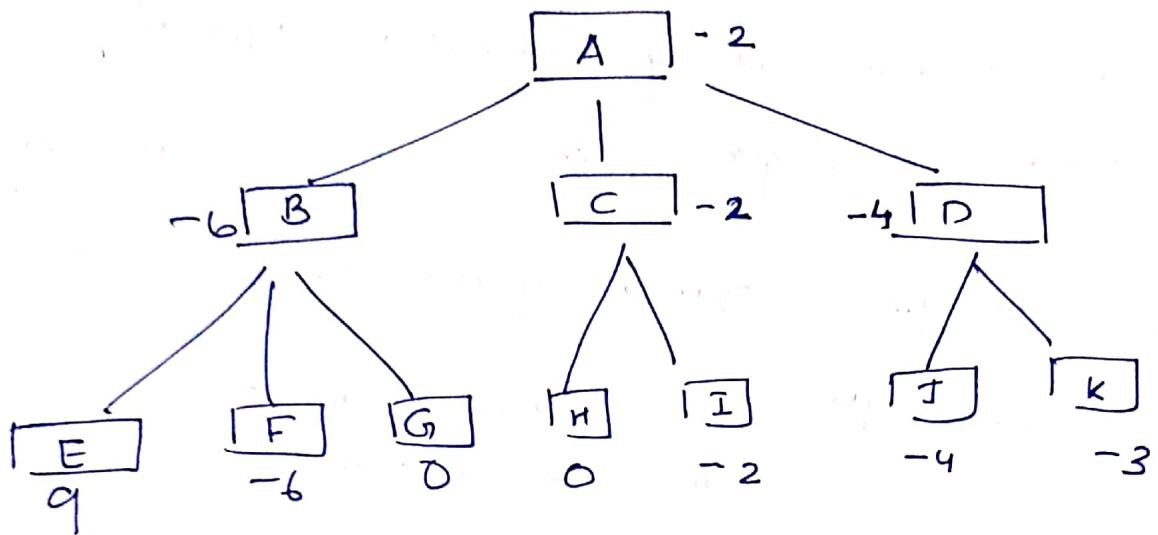
AI

Minimax

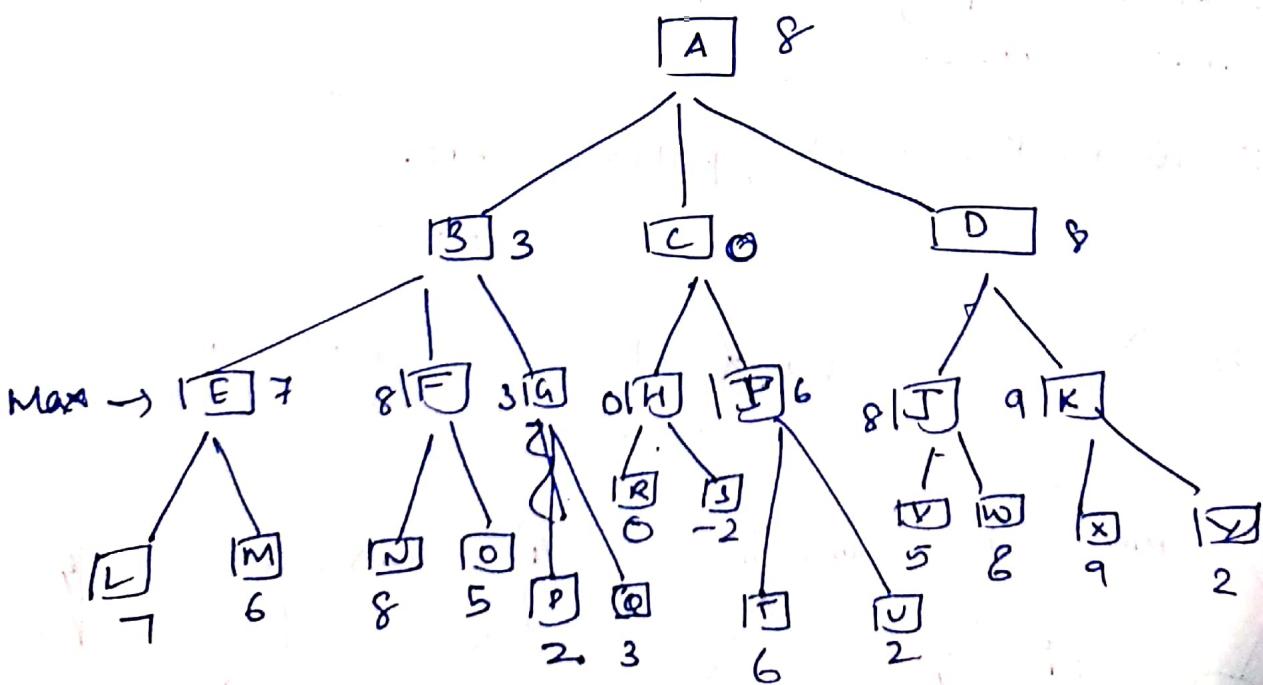
- It's a decision making algorithm typically turn based 2 player games.
- Goal → To find optimal next move.
- In algo 1st player → maximizer
2 " → minimizer
- if we assign evaluation score, one player chooses the state with highest score.
the other choose state with lowest score.
- maximizer plays for highest score.
- minimizer loses.
- Eg := tic tac toe, Chess, poker etc



→ In the given case Evaluation score is assigned only to leaf node

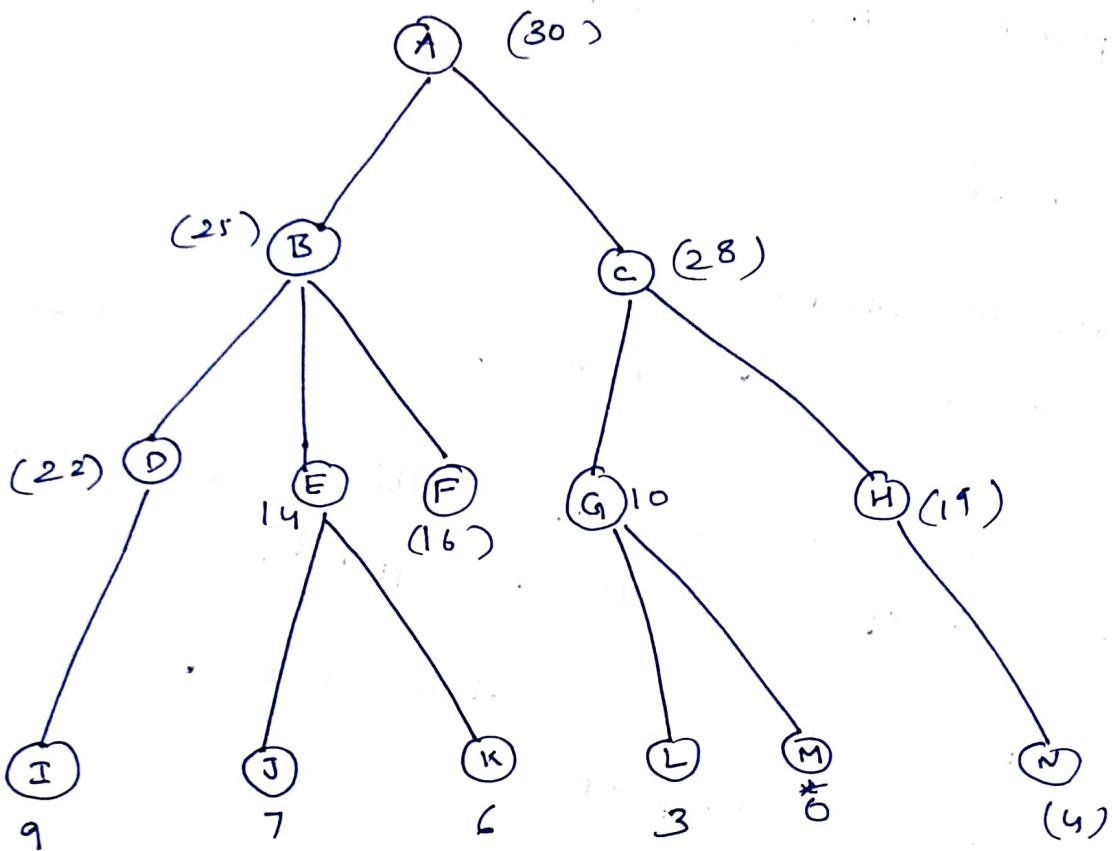


Q.) Static scores are 1st players Pov



24/10/19

Best First Search



- Instance of graph search algo
- ~~Nodes which~~
- Based on min evaluation function
- Also known as greedy algorithm.
- ~~explore~~

Steps

- 1) Traverse the root node
- 2) Traverse any neighbour of the root node, i.e maintaining a least distance from root node and insert them in ascending order into the queue
- 3) Traverse any neighbour of neighbour of the root node , that is maintaining a least distance from the root node & insert them in ascending order into the queue.
- 4) This process will continue until we get the goal node

S₁: IAT

S₂: B | C A

S₃: F | E | D | C B

S₄ E | D | C F

S₅: H | K | J | D | C E

S_6 : $\underline{\underline{I|D|C}}$ K

S_7 : $\underline{\underline{D|C}}$ J

S_8 : $\underline{\underline{I|C}}$ D

S_9 : $\underline{\underline{C}}$ E

S_{10} : $\underline{\underline{G|H}}$ C

~~S_{11}~~ : ~~$\underline{\underline{G|H}}$~~

S_{11} : $\underline{\underline{M|L|H}}$ G