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AI ASSIGNMENT # 1

Q. # 1

Definition of AI :-

The effort to make computer think logically, rationally and effectively closer or better then human.

We do agree that computer compilational can be reach towards intelligence as of a human brain by the capacity to learn the environment, perceive it and by taking against it, the computer can be one day intelligent like a human.

AI Application :-

Some of the application of AI are :-

① Soil Monitoring Sensors in Agriculture

② Radar Detection / Bird Hitting Sensors in Aviation

③ Surgical Robots in Medical Industries.

AI stimulate Natural Intelligence :-

Human intelligence is composed of emotional, social and logical intelligence that comprises to the natural intelligence.

AI on other hand, uses mathematical models that can not be fully support the attributes of natural intelligence however with the assistance of rationality it can somehow simulate the parts of natural intelligence

Criticism on AI Research :-

The criticism on AI Research and development are:-
① Increases Unemployment
② Require High Cost to Build
③ Biased Algorithms causes bad data !

Logic :-

Logic is the systematic study of the form of arguments.

Reasoning:- It is an application of logic to understand and judge something.

Ontology: Branch of philosophy that studies concepts such as existence, being, becoming & reality.

Probabilistic & Statistical Methods in AI :-

AI is based on the methods and models of probability and statistics.

The statistics work effectively in a machine learning predictive modeling. It is used to frame the problems, Data Understanding, Data cleaning, Data Preparation, Model Evaluation, Model Configuration & Model Prediction.

The probability is used to forecast, decision making, learning complex models, Data Compression e.g Bayesian Rule

Major Research Approaches in AI :-

The major research methods in AI include
① Functional Modeling   ② Cognitive Coupling

Q# 2

Agent type : For Automated Survellance Camera
Performance Measure : Prevent illegal access by detecting
Environment   : Schools, homes Buildings
Actuators   : On, Off, Detect Image, Notify
Sensors : Noise, Image recognition.

Q # 3

Blind Search:-

A blind search doesn't contain any domain knowledge such as a key, location to reach the goal. It operates in a brute force way by exploring all the available roots or paths to reach the destination. The few blind search methods are:-

① Depth first Search : In which a graph or tree is traverse in a depth way by visiting initial node to the depth of it until the goal is achieved.

② Breadth first search : In which a graph or tree is traverse in a level wise to reach destination.

Q # 4

Iterative Deepening Depth First Search:-

It is an hybrid of DFS and BFS.

It uses DFS in a BFS fashion.

All the nodes are traversed in a repetitive manner.

Initially the depth is zero and everytime increased by one after every iteration.

Algorithms-

IDDFS (src, target, maxdepth):
for limit from 0 to maxdepth:
if DLS (src, target, limit) = true
return true
return false

DLS (src, target, limit):
if src == target: return true
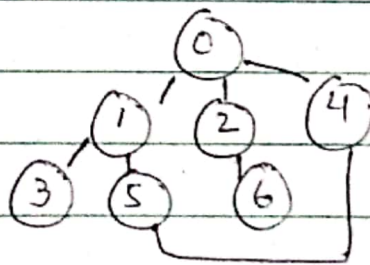if limit <= 0 : return false
for adjacent nodes of src do
if DLS (i, target, limit -1): return True
return False.

e.g

depth = 0

— level 0
— level 1
— level 2

Goal Node = 5.

Iteration

1 : depth = 1 , [0]

2 : depth = 2 , [0 → 1 → 2 → 4]

3 : depth = 3 , [0 → 1 → 3 → 5 → 2 → 6 → 4]

Q#5

Heuristics :-

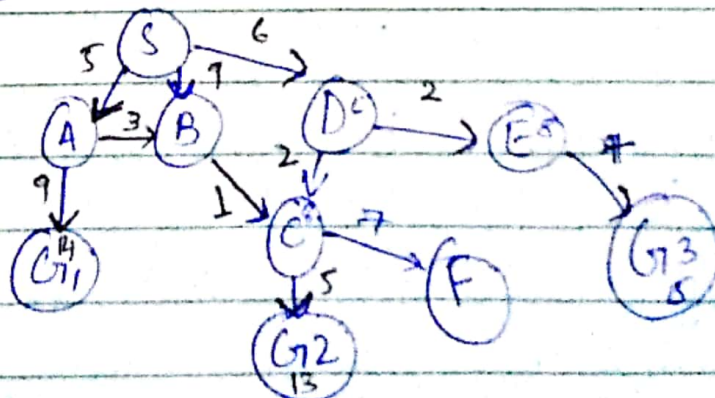It means already known knowledge or information to reach the goal.

In an informed search, problem information is provided which guide the search. It helps to efficiently find a solution that is more feasible and minimize the searching cost.

① Greedy Search   ② A* Search

Q#6.

Uniform Cost Search :- It takes the least cost node and then complete the BFS to reach the goal.

Visited : S, A, D, C, E

G1 : S → A → G1 : 14
G2 : S → D → C → G2 : 13
G3 : S → D → E → G3 : 15