SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-IOT Including CS&BCT

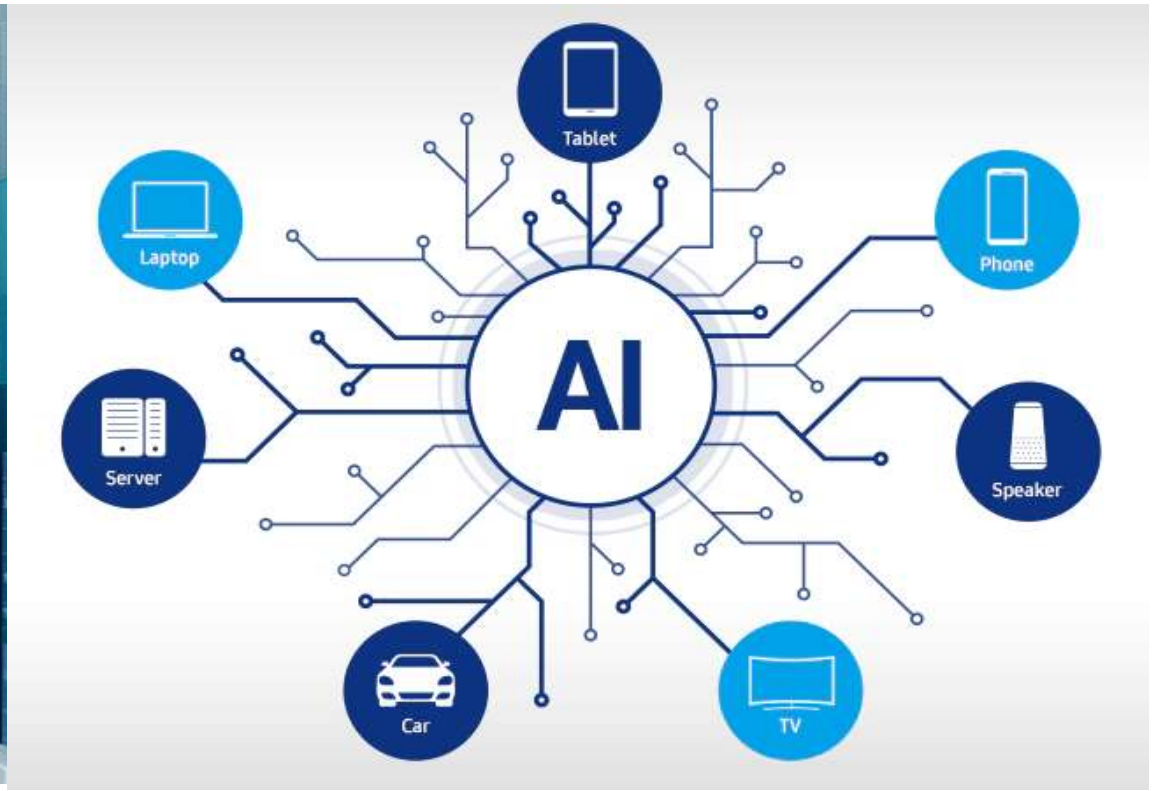
COURSE NAME :**19SB601 ARTIFICIAL INTELLIGENCE AND NATURAL LANGUAGE PROCESSING**

III YEAR / VI SEMESTER

Unit I-**INTRODUCTION TO ARTIFICIAL INTELLIGENCE& INTELLIGENT SYSTEMS**

Topic : INFORMED STRATEGIES

ARTIFICIAL INTELLIGENT



Depth-first search

- The depth-first search uses Last-in, First-out (LIFO) strategy and hence it can be implemented by using stack.

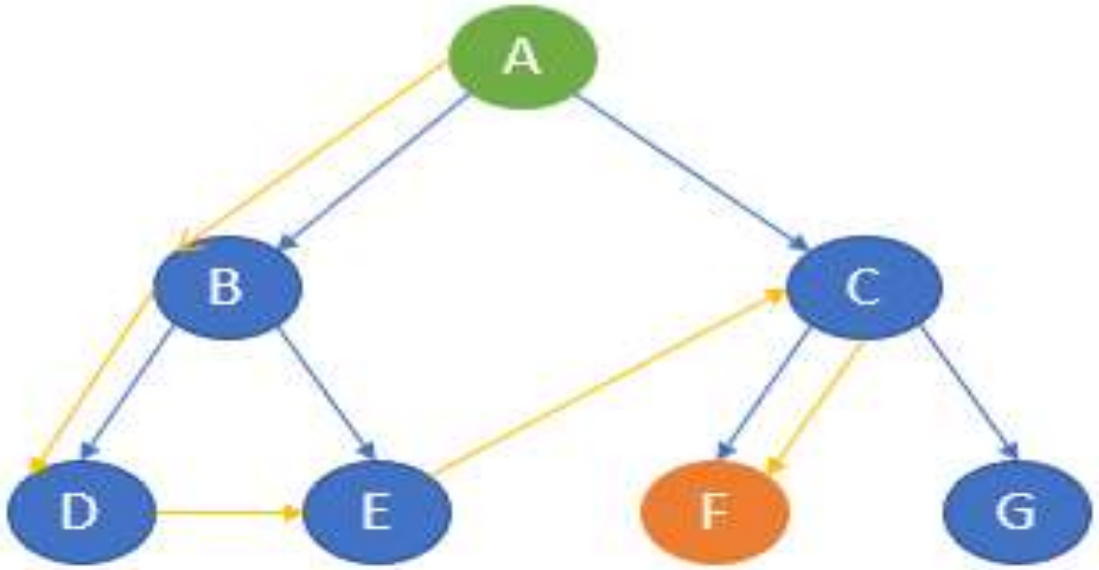
- DFS uses backtracking. That is, it starts from the initial state and explores each path to its greatest depth before it moves to the next path.

- DFS will follow
- Root node —-> Left node —-> Right node

Depth-first search

- Now, consider the example tree mentioned above.
- Here, it starts from the start state A and then travels to B and then it goes to D.
- After reaching D, it backtracks to B.
- B is already visited, hence it goes to the next depth E and then backtracks to B. as it is already visited, it goes back to A.
- A is already visited. So, it goes to C and then to F.
- F is our goal state and it stops there.

Depth-first search



The path of traversal is:

A —-> B —-> D —-> E —-> C —-> F

Let’s try to code it.

```
graph = {
'A' : ['B','C’],
'B' : ['D', 'E’],
'C' : ['F', 'G’],
'D' : [],
 'E' : [],
'F' : [],
'G' : []
}
```

```
goal = 'F’
visited = set()
def dfs(visited, graph, node):
if node not in visited:
print (node) visited.add(node)
for neighbour in graph[node]:
 if goal in visited:
break else: dfs(visited, graph, neighbour)
 dfs(visited, graph, 'A')
```

Comparison of various uninformed search algorithms

Algorithm	Time	Space	Complete	Optimality
Breadth First	O(b^d)	O(b^d)	Yes	Yes
Depth First	O(b^m)	O(bm)	No	No

Advantages of DFS

- It takes lesser memory as compared to BFS.
- The time complexity is lesser when compared to BFS.
- DFS does not require much more search.

Disadvantages of DFS

- DFS does not always guarantee to give a solution.
- As DFS goes deep down, it may get trapped in an infinite loop.

Any Query????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Thank you……