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Roll no -43
CS-A

Assignment-5

Q. Describe the working of Bellman ford algo. using suitable example?

→ solve single path problem in which edge wt. may be negative but no negative cycle exist.

it is slower but more versatile then Dijkstra's.

This algo. detect the negative cycle in a graph & report their existance.

Given a wt. directed graph $G=(V,E)$ with source s & wt. funct. $W: E \to R$, this algo. return a boolean value indicating whether or not there is a cycle that is attainable from the source. if there is such a cycle, the algo. produces the shortest paths & their wt. The algo. return TRUE if & only if a graph contains no negative-wt. cycles that are reachable from the source.

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Algo —

K → source vertex

u → destination vertex

i → no. of edge to be scanned concerning a vertex

(1) initialize - Single - SOURCE (G, S)
2. for i ← 1 to |V[G]| - 1
3. do for each edge (u, v) ∈ E [G]
4. do RELAX (u, v, w)
5. for each edge (u, v) ∈ E[G]
6. do if d[v] > d[u] + w(u, v)
7. then return FALSE
8. return TRUE

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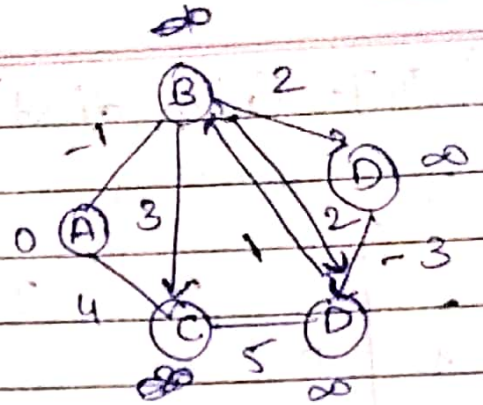
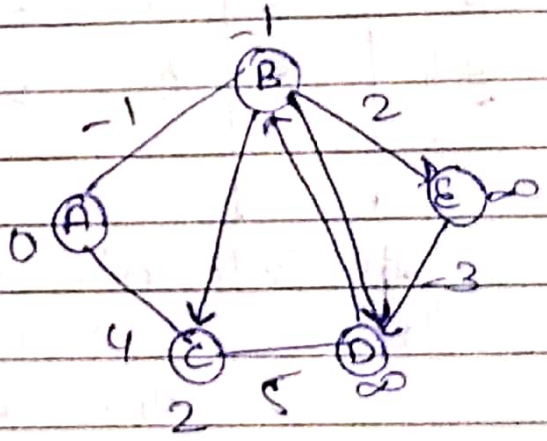
ex —



A	B	C	D	E
0	∞	∞	∞	∞

(2)

A	B	C	D	E
0	-1	∞	∞	∞
0	-1	4	∞	∞
0	-1	2	∞	∞
0	-1	2	∞	1
0	-1	2	1	1
0	-1	2	-2	1



(3)

A	B	C	D	E
0	∞	∞	∞	∞
0	-1	4	∞	∞
0	-1	2	∞	∞
0	-1	2	∞	1
0	-1	2	1	1
0	-1	2	-2	1

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Q. Compare IPV 4 & IPV6 & what are limitation of IPV4.

→

IPV 4	IPV 6
(1). it is a 32-bit IP Address.	(1). it is 128 Bit IP Address
(2). it is a numeric address & its binary bits are seprated by dot.	(2). it is an alphanumeric address, seprated by (:).
(3). no. of header field - 12.	(3). no. of header field - 8.
(4). length of header field - 20	(4). 40
(5). it has checksum fields.	(5). doesn't have checksum fields.
(6). ex - 12.244.233.165	(6). 2001:0db8:8000:0000:0000:7879
(7). Type of Address - Unicast, broadcast, multicast.	(7). Unicast, multicast, & anycast.

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(2). Address Configuration
- Manual or via DHCP

(3). Stateless address autoconfiguration

- limitation of IPV4 —

(1). lack of the address space
(2). weak protocol extensibility.
(3). Problem of security of communication
(4). lack of quality of service support
(5). Geographic limitations

Q. What do you mean by Routing? What are various type of routing Algo.?

→ A Router is a process of selecting path along which the data can be transferred from source to the destination, Routing is performed by a special device known as a routers.

- A Router works at the nw layer in the OSI model & internet layer in TCP/IP model.

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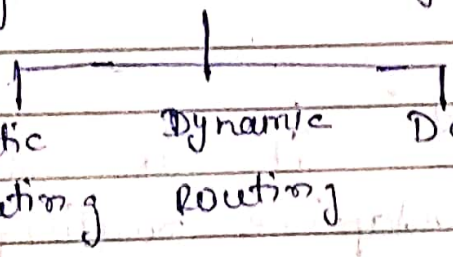
- A router is a networking device that forwards the packet based on the information avail. in the packet header & forwarding table.

- A routing algo. initialize & maintains the routing table for the process of path determination.

- type of Routing —



- Static Routing —
  - it is also known as nonadaptive Routing.
- it is a technique in which the administrator manually adds the route in a routing table.

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- Default Routing —
  it is a technique in which a router is configured to send all the packets to the same hop device, & it doesn't whether it belong to a particular network or not.

- it is also useful when the bulk of transmission n/w have to transmitt data to device.

- Dynamic Routing —
  it is also known as adaptive routing.

→ These protocols are used to discover the new routes to each the destination.

Q. Compare logical, classful & classless addressing technique?

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→ classful Routing

(1). In this, VLMS is not working.

(2). classful routing require more bandwidth.

(3). In this, hello messages are not used.

(4). it doesn't import subnet mask.

(5). In this, address is divided into three parts - n/w, subnet, host.

classless Routing

(1). In this, Variable length subnet Mask is supported.

(2). it require less bandwidth.

(3). hello messages are used.

(4). it imports subnet mask.

(5). whereas in this, triggered are used.

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