Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2024-25

Class:	TE	**Semester:**	V
Course Code:	CX501	**Course Name:**	CN

Name of Student:	Sainath Khot
Roll No. :	20
Assignment No.:	3
Title of Assignment:	IP address & Djasktra Algorithm
Date of Submission:	
Date of Correction:	

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	04
Demonstrated Knowledge	3	02
Legibility	2	01
Total	10	07

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge Legibility	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty : Sneha Yadav

Signature :

Date : 18/10/24

Assignment No. 3

Q.

=) Granted address 150.80.0.0/16

-) As n = 16 the total number of available addresses is $2^{32-n} = 2^{16} = 65536$

-) The tree groups are as follows

Group 1.

-) For this group each business needs 128

-) This means that 7 bits ($\log_2 128 = 7$) are required to define each host. The prefix length is then $32-7 = 25$ i.e $n_1 = 25$

-) The addresses in group 1 are

1st business : 150.80.0.0/25 to 150.80.0.127/25

2nd business : 150.80.0.128/25 to 150.80.0.255/25

⋮

200th : 150.80.99.128/25 to 150.80.99.255/25

Total addresses in group-1 = 200 × 128 = 25600

Group 2 :

-) For this group each business needs 16 addresses

-) Therefore 4 bits ($\log_2 16 = 4$) are required to define each host

-) The prefix length is then $32-4 = 28$ i.e $n_2 = 28$

-) The address in group-2 are

1st business : 150.80.100.0/28 To 150.80.100.15/28

2nd business : 150.80.100.16/28 To 150.80.100.31/28

⋮

400th business : 150.80.124.240/28 To 150.80.124.255/28

Group 3 :

- For this group each household needs 4 addresses
- Therefore only 2 bits ($\log_2 4 = 2$) are required to define each host
- The prefix length is then $32 - 2 = 30$ i.e $n_3 = 30$
- The addresses of group 3 are

1st household : 150.80.125.0/30 to 150.80.125.3/30

2000th household : 150.80.156.60/30 to 150.80.156.63/30

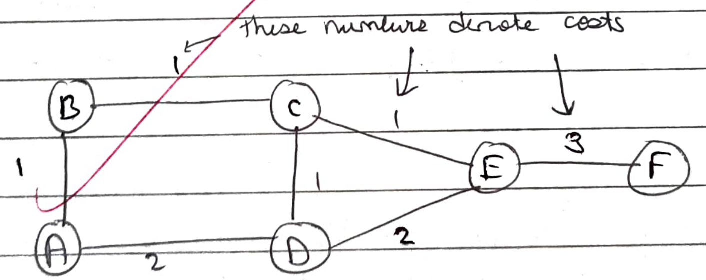
Total addresses in group -3 = 2000 × 4 = 8000

No of granted address to ISP = 65,536

No of allocated addresses by ISP = 25600 + 6400 + 8000 = 40,000

No of available address = 65,536 − 40,000
= 25,536

Q2



Soln:-

Step 1

∵ the computations are to be done at node A, the starting node will be A.

We enter this node into group P as shown in the table (a).

We add the neighbouring nodes B & D in group T along with the costs to reach them through A as shown in Table (a)

Permanent (P)	Temporary (T)
A	B(A,1), D(A,2)

Fig: Table (a)

Step 2:

- Now pick up the neighbour with the smallest cost & add it to P set. Here the neighbour with smallest cost is B
- So let us add B (A,1) to P group as shown in table (b)
- As B is added to P group, we have to add its neighbour i.e C to the T group, as shown in table (b)

Permanent (P)	Temporary (T)
A	B(A,1), D(A,2)
A, B (A,1)	D(A,2), C(B,2)

Fig: Table (b)

Note that D(A,2) has remained in T group as it is but C(B,2) is a new entry. C(B,2) means C is reached by A via B with a cost of 2

- The cost is 2 due to the path followed from A to B and then to C, as illustrated in Fig P. ~~SO~~ (b)

Step 3:

- Now pick up the neighbour in T set with the smallest cost in table b & add it to P set
- Here we choose neighbour D because it is the immediate neighbour of P
- Since D is added to P group, we have to add its neighbour i.e C & E to the T groups as shown in Table A. (c)

Permanent (P)	Temporary (T)
A	B(A,1), D(A,2)
A, B (A,1)	D(A,2), C(B,2)
A, B, (A,1), D(A,2)	E(D,4), C(B,2)

Fig: Table (c)

- Note that C(B,2) goes as it is and E(D,4) is a new entry to Table (c)
- But C (D,3) cannot be entered because it cost, is 3
- where E(D,4) means E is reached by A via D & the cost is 4.
- Similarly we can proceed further. The final table is as shown in Table (d)

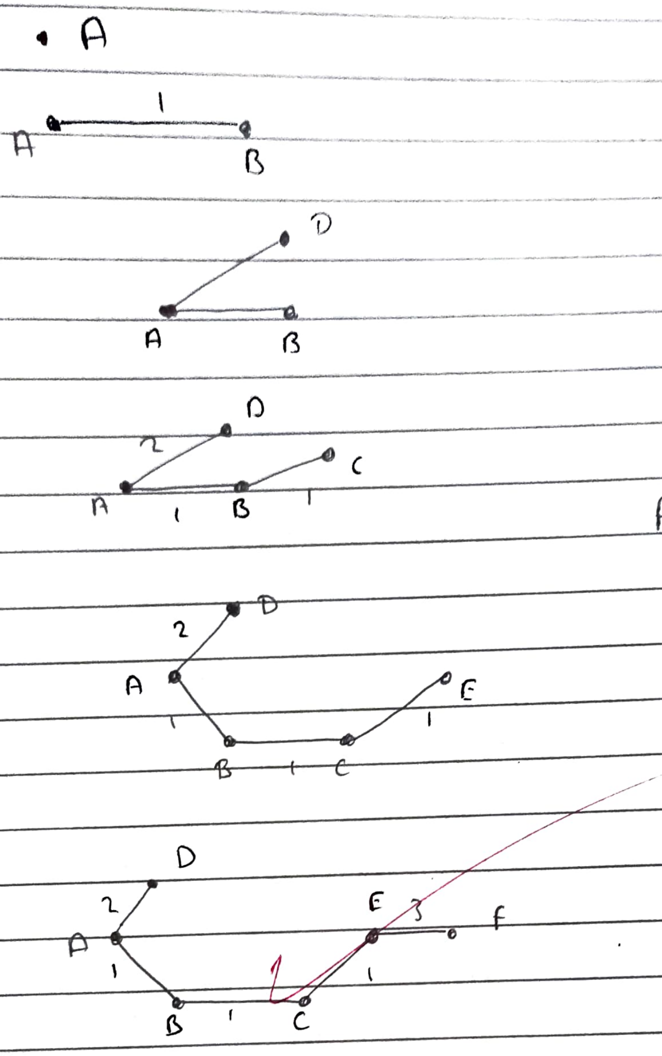


Fig : Table (c)

∴ The shortest paths from A to all other node are shown below