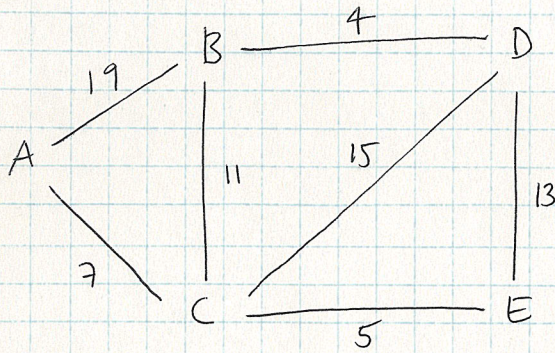
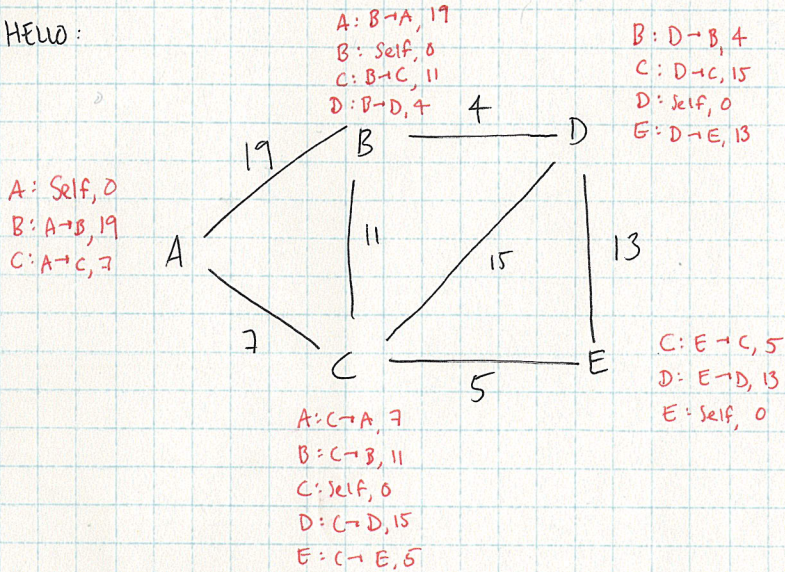


DISTANCE-VECTOR EXAMPLE

①



1. After HELLO:



2. Advertisements

- A sends $[(A, 0), (B, 19), (C, 7)]$ to B & C
- B sends $[(A, 19), (B, 0), (C, 11), (D, 4)]$ to A, C, D
- C sends $[(A, 7), (B, 11), (C, 0), (D, 15), (E, 5)]$ to A, B, D, E
- D sends $[(B, 4), (C, 15), (D, 0), (E, 13)]$ to B, C, E
- E sends $[(C, 5), (D, 13), (E, 0)]$ to C, D

3. Integrate

A receives

[(A, 19), (B, 0), (C, 11), (D, 4)] from B

[(A, 2), (B, 11), (C, 0), (D, 15), (E, 5)] from C

A's current table 1)

A: Self, 0

B: A → B, 19

C: A → C, 7

For advertisement from B:

(i) (A, 19)

cost via B = (cost to B) + 19 = 19 + 19 = 38

Are we ~~using~~ already using B to get to A? No

Is the route via B better than our current route? No

current cost to A = 0 < 38

→ No updates

(ii) (B, 0)

cost via B = (cost to B) + 0 = 19 + 0 = 19

Are we already using B to get to B? Yes; Update cost

→ No updates (cost to B via B didn't change)

(iii) (C, 11)

cost via B = (cost to B) + 11 = 19 + 11 = 30

Are we already using B to get to C? No

Is the route via B better than our current route? No

current cost to C = 7 < 30

(iv) (D, 4)

cost via B = (cost to B) + 4 = 19 + 4 = 23

Are we already using B to get to D? No

Is the route via B better than our current route? Yes

current cost to D = ∞ > 23

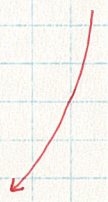
→ Update

A's table: A: Self, 0

B: A → B, 19

C: A → C, 7

D: A → B, 23



(Skill Integrating) - Now we're on C's advertisement

(i) (A, 2)

cost via E = (cost to C) + 7 = 7 + 7 = 14

Using C already? No

C's advertised route better? No (14 > 0)

(ii) (B, 11)

cost via C = (cost to C) + 11 = 7 + 11 = 18

Using C already? No

C's advertised route better? Yes (18 < 19); Update

A's table: A: Self, 0
B: A → C, 18
C: A → C, 7
D: A → B, 23

← Note that minimum-cost path need not be the direct path!

(iii) (C, 0)

cost via C = (cost to C) + 0 = 7 + 0 = 7

Using C already? Yes; update cost (no change here)

(iv) (D, 15)

cost via C = (cost to C) + 15 = 7 + 15 = 22

Using C already? No

C's advertised route better? Yes (22 < 23); Update

A's table: A: Self, 0
B: A → C, 18
C: A → C, 7
D: A → C, 22

(v) (E, 5)

cost via C = (cost to C) + 5 = 7 + 5 = 12

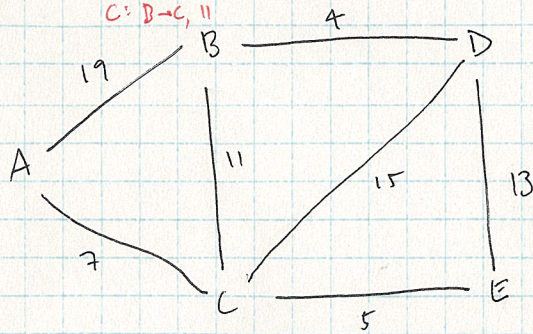
Using C already? No

C's advertised route better? Yes (12 < ∞); Update

A's table: A: Self, 0
B: A → C, 18
C: A → C, 7
D: A → C, 22
E: A → C, 12

4: After all nodes have integrated:

A: self, 0
 B: A → C, 18
 C: A → C, 2
 D: A → C, 22
 E: A → C, 12



A: B → C, 18
 B: self, 0
 C: B → C, 11
 D: B → D, 4
 E: B → C, 16

A: D → C, 22
 B: D → B, 4
 C: D → C, 15
 D: self, 0
 E: D → E, 13

D would've also discovered the route D → B to C, also of cost 15

A: C → A, 2
 B: C → B, 11
 C: self, 0
 D: C → D, 15
 E: C → E, 5

← No change, but C would've discovered the route C → B to D, also of cost 15

A: E → C, 12
 B: E → C, 16
 C: E → C, 5
 D: E → D, 13
 E: self, 0

5: Advertise & integrate again

If you perform another round of the protocol, you'll see that none of the routing tables change; the protocol has "converged".

(Advertising & integrating would continue to happen periodically, though, because link costs could change or links could fail.)