14 vertices

Cycle 1:

0 ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞
S A U B C E H D G F I J K e

1st Iteration
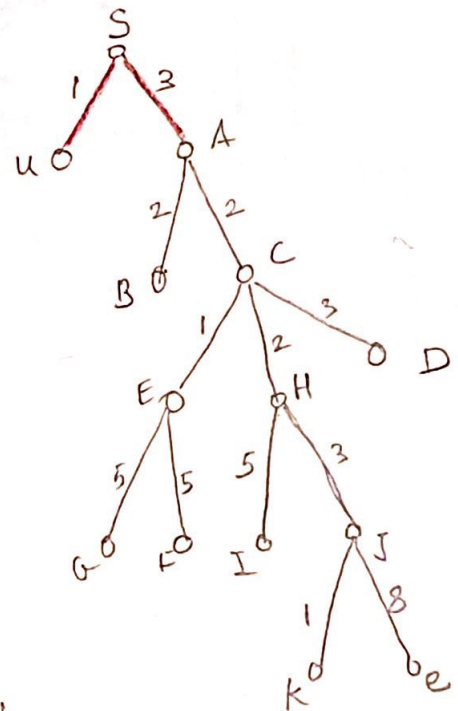
3 1
0 ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞
S A u B C E H D G F I J K e

0+3 =3 < ∞, A's value is changed to 3
0+1 =1 < ∞, u's value is changed to 1

Top-left quadrant:

0 1 3 ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞
S u A B C E H D G F I J k e

Top-right quadrant:
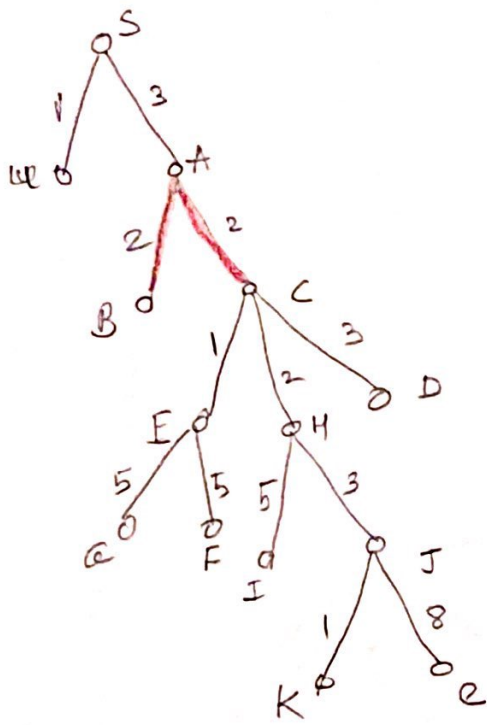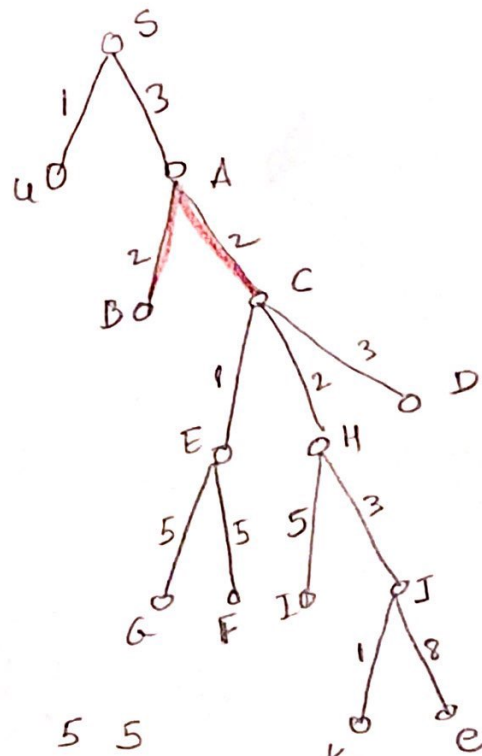
5 5
0 1 3 ∅ ∅ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞ ∞
S u A B C E H D G F I J k e

3 + 2 = 5 < ∞ , C's value changed to 5
B's value changed to 5

Bottom-left quadrant:
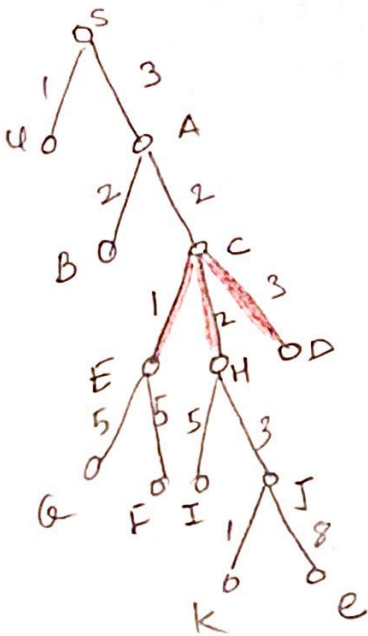
6 7 8
0. 1 3 5 5 ∅ ∅ ∅ ∞ ∞ ∞ ∞ ∞ ∞
S u A B C E H D G F I J k e

3 + 2 + 1 = 6 < ∞ , E's value changed to 6
3 + 2 + 2 = 7 < ∞ , H's value changed to 7
3 + 2 + 3 = 8 < ∞ , D's value changed to 8

Bottom-right quadrant:
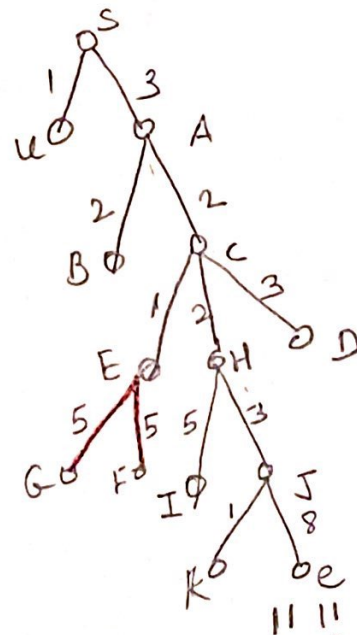
11 11
0 1 3 5 5 6 7 8 ∅ ∅ ∞ ∞ ∞ ∞
S u A B C E H D G F I J k e

3 + 2 + 1 + 5 = 11 < ∞, G's value changed to 11
3 + 2 + 1 + 5 = 1 < ∞ , F's value changed to 11

Scanned with CamScanner
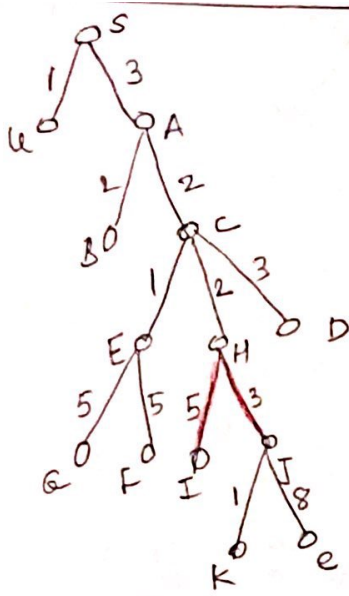
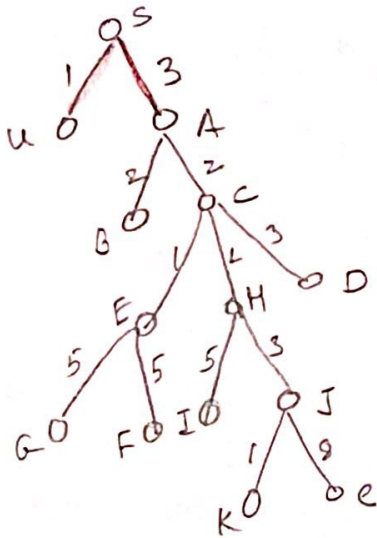0 1 3 5 5 6 7 8 11 11 12 10 ∅ ∅ ∞ ∞

S u A B C E H D G F I J k e

$3+2+2+5 = 12 < \infty$, I's value changed to 12

$3+2+2+3 = 10 < \infty$, J's value changed to 10
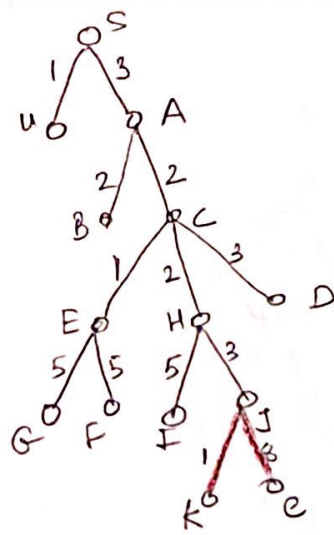
11 18

0 1 3 5 5 6 7 8 11 11 12 10 ∅ ∅
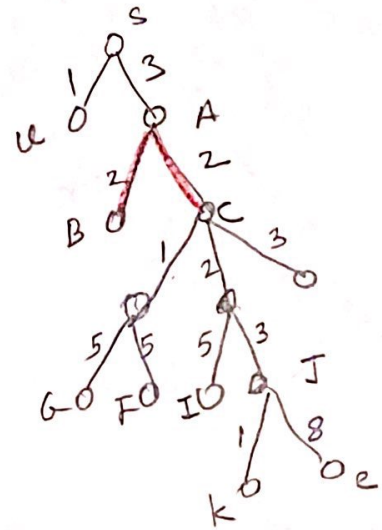
S u A B C E H D G F I J k e

$3+2+2+3+1 = 11 < \infty$, K's value changed to 11

$3+2+2+3+8 = 18 < \infty$, e's value changed to 18

Cycle 2:

0 1 3 5 5 6 7 8 11 11 12 10 11 18
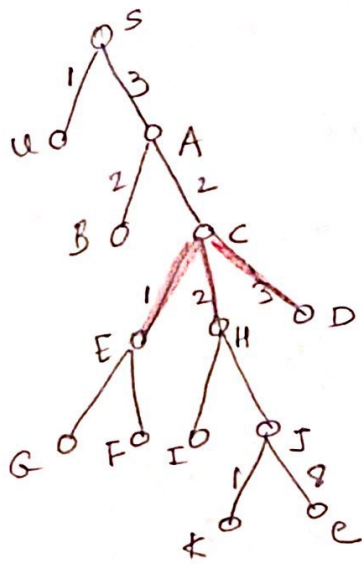
S u A B C E H D G F I J k e

$0+1 = 1$; u's value is not changed
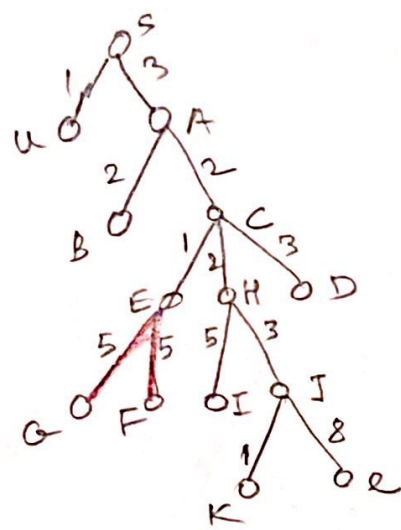
$0+3 = 3$, A's value is not changed

0 1 3 5 5 6 7 8 11 11 12 10 11 18

S u A B C E H D G F I J k e

$3+2 = 5$, B's value is not changed
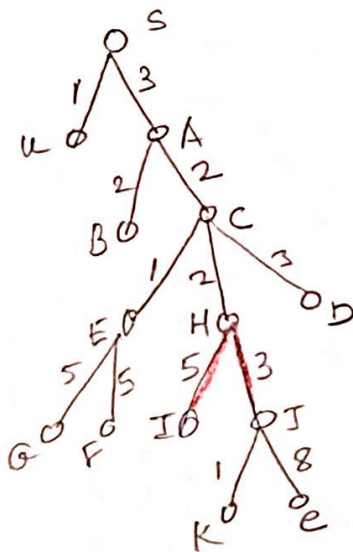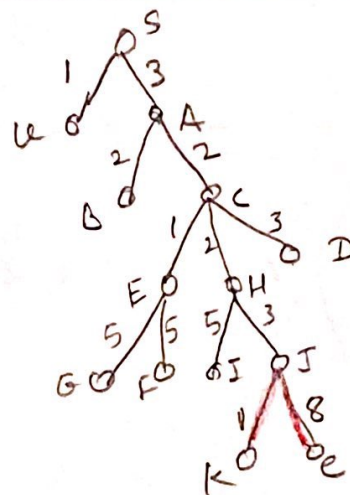
$3+2 = 5$, C's value is not changed

0 1 3 5 5 6 7 8 11 11 12 10 11 18
S u A B C E H D G F I J k e

3+2+1=6, E's value is not changed
3+2+2=7, H's value is not changed
3+2+3=8, D's value is not changed

0 1 3 5 5 6 7 8 11 11 12 10 11 18
S u A B C E H D G F I J k e

3+2+1+5=11, G's value is not changed
3+2+1+5=11, F's value is not changed

0 1 3 5 5 6 7 8 11 11 12 10 11 18
S u A B C E H D G F I J k e

3+2+2+5=12, I's value is not changed
3+2+2+3=10, J's value is not changed

0 1 3 5 5 6 7 8 11 11 12 10 11 18
S u A B C E H D G F I J k e

3+2+2+3+1=11, k's value is not changed
3+2+2+3+8=18, e's value is not changed

Shortest path is from S → A → C → H → J → e
$$0+3+2+2+3+8 = 18$$