

Rishabs-MacBook-Pro:downloads rishabmantri\$ python3 assignment_3.py

['1', '2']

1 [0, 1]

2 [0, 0]

['1', '2']

1 [0, 0]

2 [1, 0]

['1', '2']

1 [0, 1]

2 [0, 0]

In degree of the graph:

Vertex: 1 Degree: 0

Vertex: 2 Degree: 1

Out degree of the graph:

Vertex: 1 Degree: 1

Vertex: 2 Degree: 0

Iteration: 1

Vertex: 1 d: 1 pi: 2

Vertex: 2 d: inf pi: None

Vertex: 1 Degree: 1

Vertex: 2 Degree: 0

Vertex: 1 Discovered: 0 Finished: 1

Vertex: 2 Discovered: 2 Finished: 3

['q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z']

q [0, 0, 1, 1, 0, 0, 1, 0, 0, 0]

r [0, 0, 0, 0, 1, 0, 0, 0, 1, 0]

s [0, 0, 0, 0, 0, 1, 0, 0, 0, 0]

t [0, 0, 0, 0, 0, 0, 0, 1, 1, 0]

u [0, 0, 0, 0, 0, 0, 0, 0, 1, 0]

v [0, 0, 0, 0, 0, 0, 1, 0, 0, 0]

w [0, 0, 1, 0, 0, 0, 0, 0, 0, 0]

x [0, 0, 0, 0, 0, 0, 0, 0, 0, 1]

y [1, 0, 0, 0, 0, 0, 0, 0, 0, 0]

z [0, 0, 0, 0, 0, 0, 0, 1, 0, 0]

Vertex: q Discovered: 1 Finished: 16

Vertex: r Discovered: 17 Finished: 20

Vertex: s Discovered: 2 Finished: 7

Vertex: t Discovered: 8 Finished: 15

Vertex: u Discovered: 18 Finished: 19

Vertex: v Discovered: 3 Finished: 6

Vertex: w Discovered: 4 Finished: 5

Vertex: x Discovered: 9 Finished: 12

Vertex: y Discovered: 13 Finished: 14

Vertex: z Discovered: 10 Finished: 11

Iteration: 0

Vertex: A d: inf pi: None

Vertex: B d: inf pi: None
Vertex: C d: inf pi: None
Vertex: D d: inf pi: None
Vertex: E d: inf pi: None
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 14 pi: G

Iteration: 1

Vertex: A d: inf pi: None
Vertex: B d: inf pi: None
Vertex: C d: inf pi: None
Vertex: D d: inf pi: None
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 10 pi: F

Iteration: 2

Vertex: A d: inf pi: None
Vertex: B d: 2 pi: E
Vertex: C d: inf pi: None
Vertex: D d: 15 pi: E
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 10 pi: F

Iteration: 3

Vertex: A d: 4 pi: B
Vertex: B d: 2 pi: E
Vertex: C d: 9 pi: B
Vertex: D d: 15 pi: E
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 5 pi: B

Iteration: 4

Vertex: A d: 4 pi: B
Vertex: B d: 2 pi: E
Vertex: C d: 9 pi: B
Vertex: D d: 15 pi: E
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 5 pi: B

Iteration: 5

Vertex: A d: 4 pi: B
Vertex: B d: 2 pi: E

Vertex: C d: 9 pi: B
Vertex: D d: 15 pi: E
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 5 pi: B

Iteration: 6

Vertex: A d: 4 pi: B
Vertex: B d: 2 pi: E
Vertex: C d: 9 pi: B
Vertex: D d: 15 pi: E
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 5 pi: B

Iteration: 7

Vertex: A d: 4 pi: B
Vertex: B d: 2 pi: E
Vertex: C d: 9 pi: B
Vertex: D d: 15 pi: E
Vertex: E d: 8 pi: F
Vertex: F d: 3 pi: G
Vertex: G d: 0 pi: None
Vertex: H d: 5 pi: B

Bellman ford!

Iteration: Initial

Vertex: s d: inf pi: None
Vertex: t d: inf pi: None
Vertex: x d: inf pi: None
Vertex: y d: inf pi: None
Vertex: z d: 0 pi: None

Iteration: 0

Vertex: s d: 2 pi: z
Vertex: t d: 8 pi: s
Vertex: x d: 7 pi: z
Vertex: y d: 9 pi: s
Vertex: z d: 0 pi: None

Iteration: 1

Vertex: s d: 2 pi: z
Vertex: t d: 5 pi: x
Vertex: x d: 6 pi: y
Vertex: y d: 9 pi: s
Vertex: z d: 0 pi: None

Iteration: 2

Vertex: s d: 2 pi: z
Vertex: t d: 4 pi: x

Vertex: x d: 6 pi: y
Vertex: y d: 9 pi: s
Vertex: z d: 0 pi: None

Iteration: 3

Vertex: s d: 2 pi: z
Vertex: t d: 4 pi: x
Vertex: x d: 6 pi: y
Vertex: y d: 9 pi: s
Vertex: z d: 0 pi: None

Graph has no cycle

Bellman ford!

Iteration: Initial

Vertex: s d: inf pi: None
Vertex: t d: inf pi: None
Vertex: x d: inf pi: None
Vertex: y d: inf pi: None
Vertex: z d: 0 pi: None

Iteration: 0

Vertex: s d: 2 pi: z
Vertex: t d: 8 pi: s
Vertex: x d: 4 pi: z
Vertex: y d: 9 pi: s
Vertex: z d: 0 pi: None

Iteration: 1

Vertex: s d: 2 pi: z
Vertex: t d: 2 pi: x
Vertex: x d: 4 pi: z
Vertex: y d: 9 pi: s
Vertex: z d: 0 pi: None

Iteration: 2

Vertex: s d: 0 pi: z
Vertex: t d: 2 pi: x
Vertex: x d: 2 pi: z
Vertex: y d: 7 pi: s
Vertex: z d: -2 pi: t

Iteration: 3

Vertex: s d: 0 pi: z
Vertex: t d: 0 pi: x
Vertex: x d: 2 pi: z
Vertex: y d: 7 pi: s
Vertex: z d: -2 pi: t

Graph has negative cycle

Iteration: Initial

Vertex: s d: 0 pi: None
Vertex: t d: inf pi: None
Vertex: x d: inf pi: None

Vertex: y d: inf pi: None

Vertex: z d: inf pi: None

Iteration: 1

Vertex: s d: 0 pi: None

Vertex: t d: 3 pi: s

Vertex: x d: inf pi: None

Vertex: y d: 5 pi: s

Vertex: z d: inf pi: None

Iteration: 2

Vertex: s d: 0 pi: None

Vertex: t d: 3 pi: s

Vertex: x d: 9 pi: t

Vertex: y d: 5 pi: s

Vertex: z d: inf pi: None

Iteration: 3

Vertex: s d: 0 pi: None

Vertex: t d: 3 pi: s

Vertex: x d: 9 pi: t

Vertex: y d: 5 pi: s

Vertex: z d: 11 pi: y

Iteration: 4

Vertex: s d: 0 pi: None

Vertex: t d: 3 pi: s

Vertex: x d: 9 pi: t

Vertex: y d: 5 pi: s

Vertex: z d: 11 pi: y

Iteration: 5

Vertex: s d: 0 pi: None

Vertex: t d: 3 pi: s

Vertex: x d: 9 pi: t

Vertex: y d: 5 pi: s

Vertex: z d: 11 pi: y