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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL)  »  Social Networks (course)

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## Course outline

**How does an NPTEL online course work? ()**

**Week 0 ()**

**Week 1 ()**

**Week 2 ()**

**Week 3 ()**

**Week 4 ()**

**Week 5 ()**

**Week 6 ()**

**Week 7 ()**

**Week 8 ()**

**Week 9 ()**

**Week 10 ()**

**Week 11 ()**

# Week 8: Assignment 8

**The due date for submitting this assignment has passed.**
**Due on 2022-09-21, 23:59 IST.**

## Assignment submitted on 2022-09-21, 20:02 IST

1)  In a social network, if tour guides point people to tourist destinations, which of the     *1 point*
following is correct ?

○ Hubs are represented by tour guides and authorities by tourist destinations.

○ Hubs are represented by tourist destinations and authorities by tour guides.

◉ Tourist spots and tour guides both act as hubs.

○ Tour guides and tourist destinations both represent authorities.

No, the answer is incorrect.
Score: 0

Accepted Answers:
*Hubs are represented by tour guides and authorities by tourist destinations.*

2)  If a Markov matrix A whose eigenvectors and eigenvalues are v1,v2 and λ1, λ2     *1 point*
respectively is applied on a vector V repeatedly k times, which of the following is true considering
we keep normalising the resultant vector after each iteration and λ1 is the greater eigenvalue and
k is very large?

◉
$A^k V = v1$
○
$A^k V = v2$
○
$A^k V = v1 + v2$
○
$A^k V = v1 - v2$

Yes, the answer is correct.
Score: 1

Accepted Answers:

$A^k V = v1$

3) What will be the coordinates of the vector (5, 7) after normalizing it to a unit circle centred at the origin?    **1 point**

○ (0.81, 0.58)

◉ (0.58, 0.81)

○ (0.18, 0.58)

○ (0.85, 0.18)

Yes, the answer is correct.
Score: 1

Accepted Answers:
*(0.58, 0.81)*

4) What will be the resultant vector when we apply the matrix M on the vector (7, 9)?    **1 point**

Where, M = $\begin{bmatrix} 5 & 6 \\ 8 & 3 \end{bmatrix}$

○ (91, 82)

○ (27, 56)

◉ (89, 83)

○ (12, 45)

Yes, the answer is correct.
Score: 1

Accepted Answers:
*(89, 83)*

5) Which of the following is a property of a Markov matrix?    **1 point**

○ All the eigenvalues are greater than 1.

○ The smallest eigenvalue is 1.

◉ The largest eigenvalue is 1.

○ All the eigenvalues are less than 1.

Yes, the answer is correct.
Score: 1

Accepted Answers:
*The largest eigenvalue is 1.*

6) Is the given matrix a Markov matrix?    **1 point**

$$\begin{bmatrix} \frac{1}{2} & \frac{1}{2} & 1 \\ \frac{1}{4} & \frac{1}{2} & 0 \\ \frac{1}{4} & 0 & 0 \end{bmatrix}$$
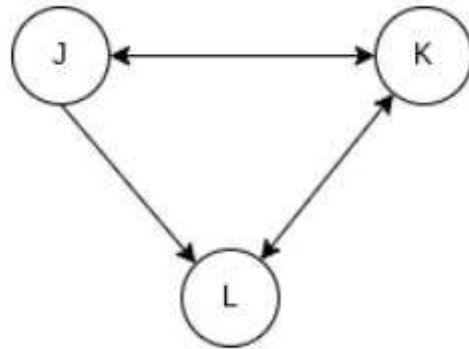
⦿ Yes

◯ No

Yes, the answer is correct.
Score: 1
Accepted Answers:
*Yes*

7) What values of PageRank will the nodes (J, K, L) of the given graph have after the   **1 point**
first iteration if the initial values are ⅓ for each node?



◯ (0, ½, ½)

⦿ (⅙, ½, ⅓)

◯ (⅓, ⅓, ⅓)

◯ (½, ⅙, ⅓)

Yes, the answer is correct.
Score: 1
Accepted Answers:
*(⅙, ½, ⅓)*

8) In a social network of recommenders and resources, how can the rating of node X   **1 point**
increase
if a higher rating is considered good?
**Statement I** - By pointing Good nodes at X.
**Statement II** - By pointing X at good nodes.

⦿ Both statements are correct.

◯ Statement I is correct & Statement II is incorrect.

◯ Statement I is incorrect & Statement II is correct.

◯ Both statements are incorrect.

Yes, the answer is correct.
Score: 1
Accepted Answers:
*Both statements are correct.*

9) Will a PageRank graph with the below adjacency matrix converge?   **1 point**

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

◉ Yes

◯ No

Yes, the answer is correct.
Score: 1
Accepted Answers:
*Yes*

10) Choose the correct option based on the given statements.                                    **1 point**
**Statement I** - Applying a matrix on its eigenvectors only changes the direction of the
eigenvector.
**Statement II** - Eigenvectors of a matrix are linearly dependent on each other.

◯ Both statements are correct.

◯ Statement I is correct & Statement II is incorrect.

◯ Statement I is incorrect & Statement II is correct.

◉ Both the statements are incorrect.

Yes, the answer is correct.
Score: 1
Accepted Answers:
*Both the statements are incorrect.*