

## Assignment-1 (Quiz) - Results



### Attempt 1 of 2

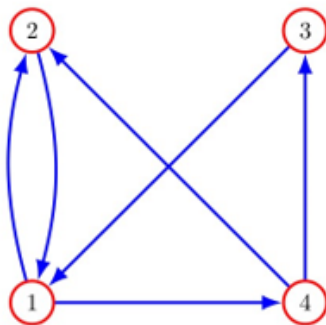
Written Dec 7, 2023 7:19 PM - Dec 7, 2023 7:34 PM

Attempt Score **0.8 / 2 - 40 %**

Overall Grade (Highest Attempt) **1.6 / 2 - 80 %**

### Question 1

Suppose we have four stations that are connected by train services as shown in the following graph:



The adjacency matrix  $A$  associated with this graph has entries defined as

$$a_{ij} = \begin{cases} 1 & \text{if direct train service exists from station } j \text{ to station } i, \\ 0 & \text{otherwise.} \end{cases}$$

Choose the correct adjacency matrix from the options below:

☐ 
$$\mathbf{A} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix}$$



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## Question 2

What does  $x_2^{(3)}$  represent in the following data matrix?

	HR	BP	Temp
Patient-1	76	126	38.0
Patient-2	74	120	38.0
Patient-3	72	118	37.5
Patient-4	78	136	37.0

☐ TEMP of the 2<sup>nd</sup> patient

☒ BP of the 3<sup>rd</sup> patient

☐ BP of the 2<sup>nd</sup> patient

☐ BP of the 2<sup>nd</sup> patient

## Question 3

The MAHE registrar has the complete list of courses taken by each graduating student in a program. This data is represented as an  $m \times n$ -matrix  $\mathbf{X}$  such that

$$x_{ij} = \begin{cases} 1 & \text{if student } i \text{ has taken course } j, \\ 0 & \text{otherwise.} \end{cases}$$

The dot product  $x^{(4)} \cdot \mathbf{1}$ , where  $\mathbf{1}$  is the vector whose entries are all equal to 1, gives the

- ☒ Number of courses taken by the 4<sup>th</sup> student  
☐ Number of students who have not taken the 4<sup>th</sup> course  
☐ Number of courses not taken by the 4<sup>th</sup> student  
☒ Number of students in the 4<sup>th</sup> course

#### Question 4

The MAHE registrar has the complete list of courses taken by each graduating student in a program. This data is represented as an  $m \times n$ -matrix  $\mathbf{X}$  such that

$$x_{ij} = \begin{cases} 1 & \text{if student } i \text{ has taken course } j, \\ 0 & \text{otherwise.} \end{cases}$$

The number of students who have taken both the 5<sup>th</sup> and 6<sup>th</sup> courses is the dot product :

- ☐  $x^{(5)} \cdot x^{(6)}$   
☒  $x_5 \cdot x^{(6)}$   
☒  $x_5 \cdot x_6$   
☐  $x^{(5)} \cdot x_6$

#### Question 5

$$\mathbf{A} = \begin{bmatrix} 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \end{bmatrix} ?$$

What is the effect of multiplying a vector  $\mathbf{x}$  by the matrix

- ☒ Cycle the components of  $\mathbf{x}$  upward by 1 step  
☐ Switch the 1<sup>st</sup> and 5<sup>th</sup> components of  $\mathbf{x}$   
☐ Switch the 2<sup>nd</sup> and 5<sup>th</sup> components of  $\mathbf{x}$   
☒ Cycle the components of  $\mathbf{x}$  downward by 1 step

Done