CCE Proficience – 2018

Basics of Data Analytics – ML & NLP

Assignmet 3

Q1. Explain Gauss-Siedel method used to solve a linear set of equations.

Q2. Explain Gauss-Jordan elimination method used to solve a linear set of equations.

Q3. If A and B are the two matrices of the same order then prove

$(A + B)^2 = A^2 + B^2 + 2AB$ Only if $AB = BA$

Q4. If s and t are scalars, and A and B are matrices, prove that:

$$IA = A$$
$$s(A + B) = sA + sB$$
$$(s + t)A = sA + tA$$
$$s(tA) = (st)A$$
$$A + 0 = A$$
$$A - A = 0$$

Q5. If both AB and BA are feasible, prove that $AB \neq BA$.

Q6. Prove that:

$$[A^T]^T = A$$
$$[A + C]^T = A^T + C^T$$
$$[AB]^T = B^T . A^T$$

Q7. if

$A = \begin{bmatrix} 1 & 2 & -1 \\ 3 & 5 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 4 & 5 \end{bmatrix}$

Find 2A, -3B, (A - 2B), (3A + 4B)

Q8. If

$A = \begin{bmatrix} 2 & -1 & 0 \\ 3 & 1 & 2 \\ -1 & 1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 0 & 1 \\ -1 & 1 & 0 \end{bmatrix}$, $C = \begin{bmatrix} -1 & -1 & 1 \\ 1 & 2 & 3 \\ -1 & 1 & 0 \end{bmatrix}$

Find the matrix D such that 2A + B -3C + 2D = A + 4C

Q9. If

$$A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 1 & 4 \end{bmatrix}, \qquad B = \begin{bmatrix} 2 & -1 & 3 \\ 5 & 1 & 2 \\ 4 & 6 & -2 \end{bmatrix}, \qquad C = \begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix}, \qquad D = \begin{bmatrix} 2 & -2 & 3 \end{bmatrix}$$

Find, if possible, AB, BC, CA, DC, DB, AD and CD.

Q10. Find A^2, A^3, A^4 if

$$A = \begin{bmatrix} 0 & 1 & 0 \\ -2 & 0 & 1 \\ 4 & -1 & 0 \end{bmatrix}$$