

## Assignment

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- ① Use the Newton-Raphson method to obtain a root, correct to three decimal places, of each of the following equations

①  $x = \frac{1 + \cos x}{3}$

②  $e^x = 4x$

- ② Find the cubic polynomial which takes the following values:  
 $y(1) = 24$ ,  $y(3) = 120$ ,  $y(5) = 336$  and  $y(7) = 720$ . Hence, or otherwise, obtain the value of  $y(8)$ .

- ③ Factorize the matrix

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 3 \\ 3 & 1 & 2 \end{bmatrix}$$

into LU form.

- ④ Use Gauss elimination to solve the system

$$2x + y + z = 10$$

$$3x + 2y + 3z = 18$$

$$x + 4y + 9z = 16$$



⑤ Solve the equations

$$2x + 3y + z = 9$$

$$x + 2y + 3z = 6$$

$$3x + y + 2z = 8$$

by the method of LU decomposition.

⑥ Find the eigenvalues of the matrix and inverse of the matrix.

$$A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$$

⑦ Use Gauss-Jordan method to solve the system

$$4x_1 + 3x_2 - x_3 = 6$$

$$3x_1 + 5x_2 + 3x_3 = 4$$

$$x_1 + x_2 + x_3 = 1$$

⑧ Solve the system

$$10x + 2y + z = 9$$

$$2x + 20y - 2z = -44$$

$$-2x + 3y + 10z = 22$$

by Jacobi's method.

⑨ Solve the system given in problem ⑧ by Gauss-Seidel method.

(10) Find a root, correct to three decimal places and lying between 0 and 0.5 of the equation

$$4e^{-x} \sin x - 1 = 0$$

(use Bisection method.)