1. Create and transform vectors and matrices (the transpose vector (matrix) conjugate
   1. transpose of a vector (matrix))
2. Generate the matrix into echelon form and find its rank.
3. Find cofactors, determinant, adjoint and inverse of a matrix.
4. Solve a system of Homogeneous and non-homogeneous equations using Gauss
   1. elimination method.
5. Solve a system of Homogeneous equations using the Gauss Jordan method.
6. Generate basis of column space, null space, row space and left null space of a matrix

space.

1. Check the linear dependence of vectors. Generate a linear combination of given vectors

of Rn/ matrices of the same size and find the transition matrix of given matrix space.

1. Find the orthonormal basis of a given vector space using the Gram-Schmidt

orthogonalization process.

1. Check the diagonalizable property of matrices and find the corresponding eigenvalue

and verify the Cayley- Hamilton theorem.

1. Application of Linear algebra: Coding and decoding of messages using nonsingular

matrices. eg code “Linear Algebra is fun” and then decode it.

1. Compute Gradient of a scalar field.
2. Compute Divergence of a vector field.
3. Compute Curl of a vector field.