

# 43 Lecture - CS201

## Important Subjective

- 1. What is the difference between a square matrix and a rectangular matrix?**  
A square matrix has an equal number of rows and columns, while a rectangular matrix has different numbers of rows and columns.
- 2. What is the process of multiplying two matrices called, and how is it performed?**  
Matrix multiplication is the process of multiplying two matrices by taking the dot product of each row of the first matrix with each column of the second matrix. The resulting matrix will have the same number of rows as the first matrix and the same number of columns as the second matrix.
- 3. What is the transpose of a matrix?**  
The transpose of a matrix is the matrix obtained by interchanging its rows and columns.
- 4. What is the determinant of a matrix, and how is it calculated?**  
The determinant of a matrix is a scalar value that can be calculated using various methods, including Gaussian elimination, cofactor expansion, and LU decomposition. It is used to determine the invertibility of a matrix.
- 5. What is a diagonal matrix?**  
A diagonal matrix is a square matrix in which all the off-diagonal elements are zero.
- 6. What is the difference between a symmetric matrix and a skew-symmetric matrix?**  
A symmetric matrix is a matrix that is equal to its transpose, while a skew-symmetric matrix is a matrix whose transpose is equal to the negative of the original matrix.
- 7. What is an identity matrix?**  
An identity matrix is a square matrix in which all the diagonal elements are equal to one and all the off-diagonal elements are equal to zero.
- 8. What is an upper triangular matrix?**  
An upper triangular matrix is a square matrix in which all the elements below the main diagonal are zero.
- 9. What is the inverse of a matrix, and how is it calculated?**  
The inverse of a matrix is a matrix that, when multiplied by the original matrix, gives the identity matrix. It can be calculated using various methods, including Gauss-Jordan elimination and LU decomposition.
- 10. What are some practical applications of matrices in programming?**  
Matrices are used in various applications such as image processing, 3D graphics, machine learning, and numerical simulations. They can also be used to represent data in a tabular format.