**WAP in R to calculate eigenvalues and eigenvectors of a matrix.**

**Step-by-Step Guide:**

1. **Create a matrix** (or use an existing matrix).
2. **Use the eigen() function** to calculate both eigenvalues and eigenvectors.
3. **Display the results**.

# 1. Define a square matrix

A <- matrix(c(4, 1, 1, 3), nrow=2, byrow=TRUE)

# View the matrix

print("Matrix A:")

print(A)

# 2. Calculate eigenvalues and eigenvectors

eigen\_result <- eigen(A)

# 3. Display the eigenvalues

print("Eigenvalues:")

print(eigen\_result$values)

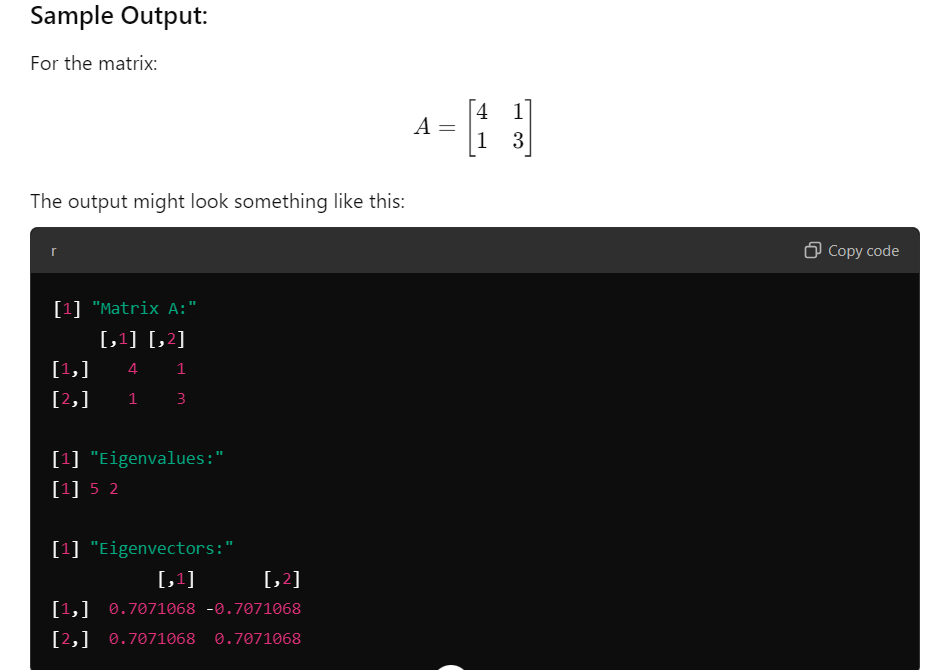
# 4. Display the eigenvectors

print("Eigenvectors:")

print(eigen\_result$vectors)

**Explanation:**

* **Matrix Definition**: In the example, A is a 2x2 matrix, but this can be any square matrix.
* **Eigen Function**: The eigen() function returns a list containing the eigenvalues and eigenvectors of the matrix.
  + eigen\_result$values gives the eigenvalues.
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**Key Points:**

* **Eigenvalues** represent the factors by which the eigenvectors are scaled when the matrix is applied to them.
* **Eigenvectors** are the directions along which the matrix transformation acts by stretching or compressing.