**MATHEMATICS PRACTICAL**

**RAMANUJAN COLLEGE**

**DSC 03: MATHEMATICS FOR COMPUTING**

**SEMESTER-1**

**(2025-26)**

**Submitted By:- Submitted To:-**

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Course: **B.Sc. (Hons) Computer Science** Department of Computer Science

**Acknowledgement**

I would like to take this opportunity to acknowledge everyone who has helped us in every stage of this project.

I am deeply indebted to my mathematics Professor, **Dr Aakash** for his guidance and suggestions in completing this project. The completion of this project was possible under his guidance and support.

I am also very thankful to my parents and my friends who have boosted me up morally with their continuous support.

At last but not least, I am very thankful to God almighty for showering his blessings upon me.

**Student Sign:-**

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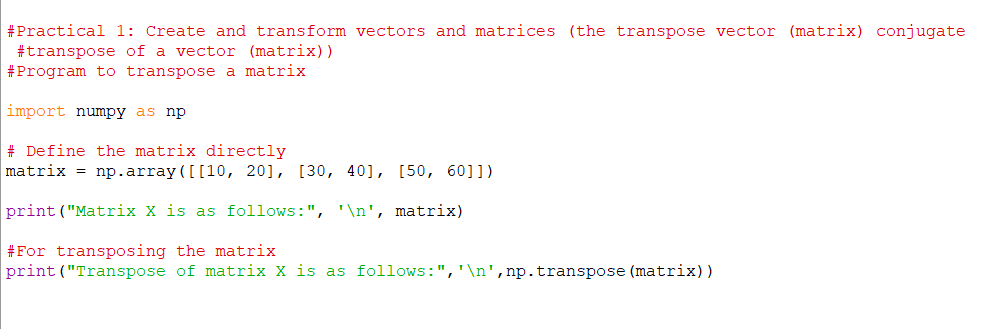
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**# Practical 1**

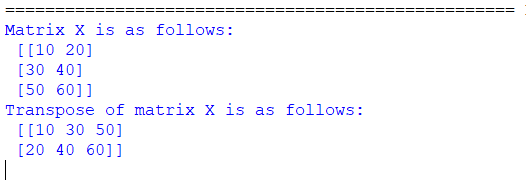
**Create and transform vectors and matrices (the transpose vector (matrix) conjugate**

1. **transpose of a vector (matrix)**

**Code:**



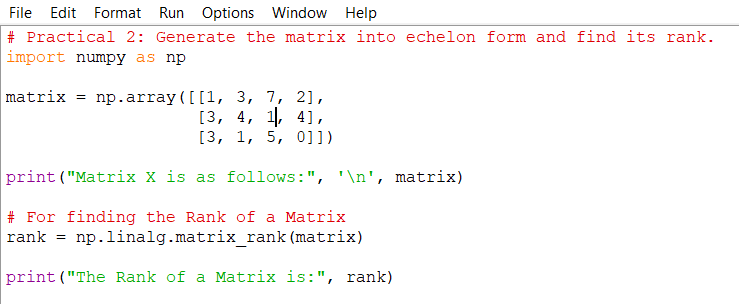
**Output:-**

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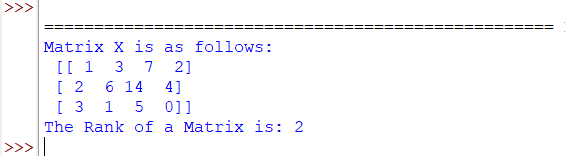
**# Practical 2**

**Generate the matrix into echelon form and find its rank.**

**Code:-**

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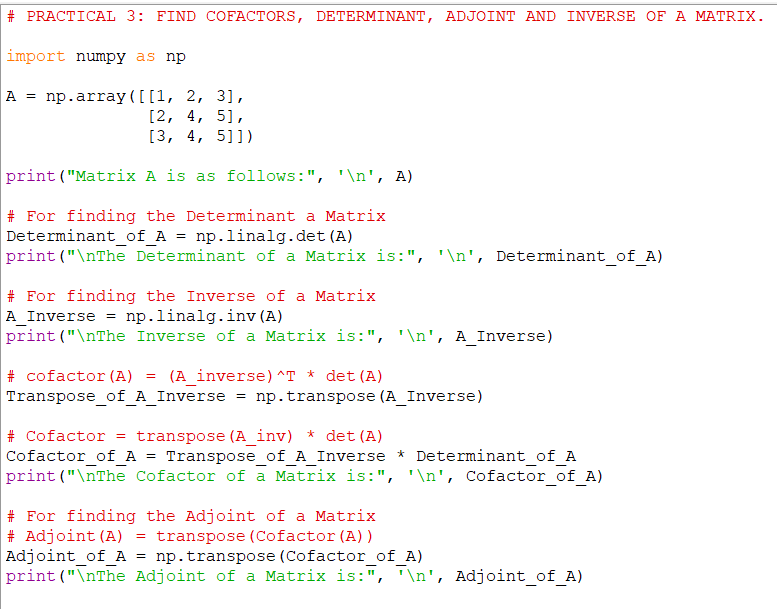
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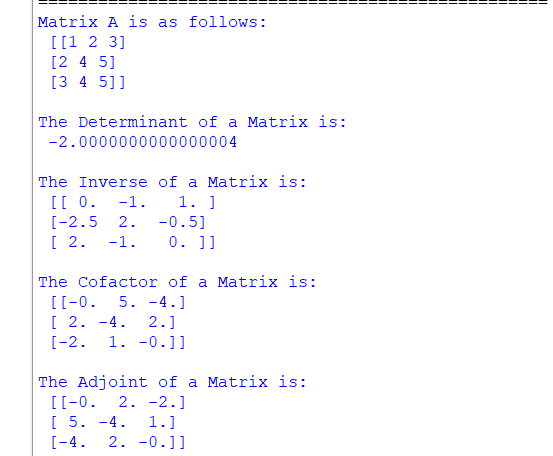


**# Practical 3**

**Find cofactors, determinant, adjoint and inverse of a matrix.**

**Code:-**

**Output:-**

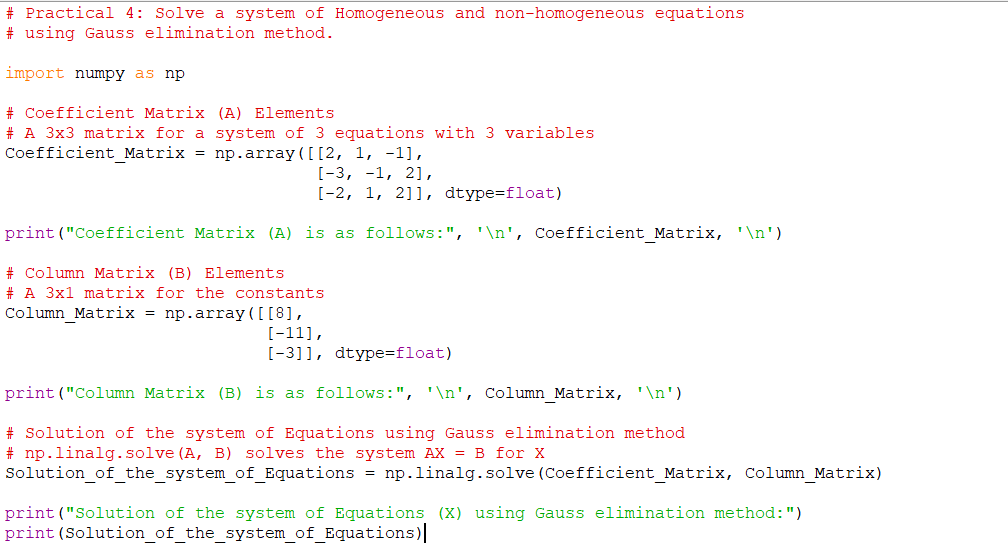
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**# Practical 4**

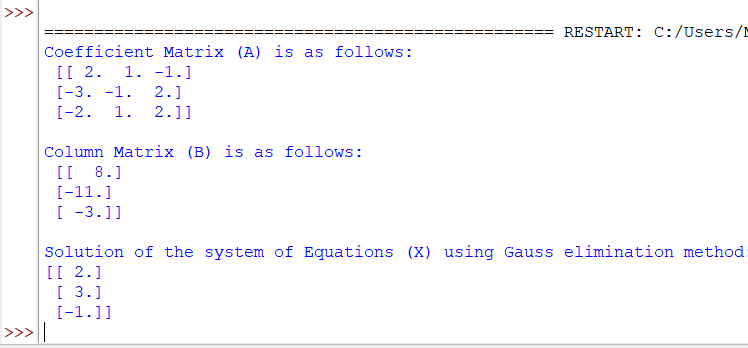
**Solve a system of Homogeneous and non-homogeneous equations using**

1. **Gauss elimination method.**

**Code:-**

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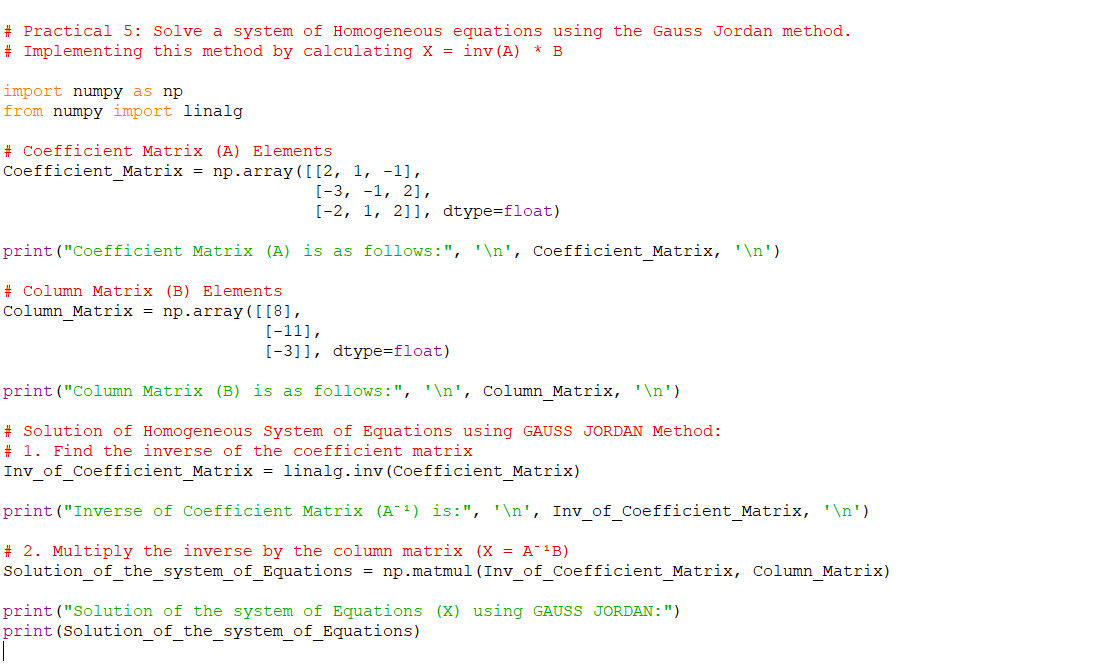
**Output:-**



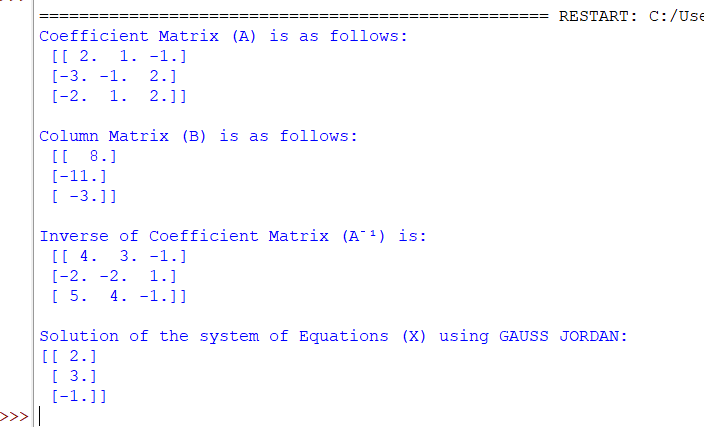
**# Practical 5**

**Solve a system of Homogeneous equations using the Gauss Jordan method.**

**Code:**

****

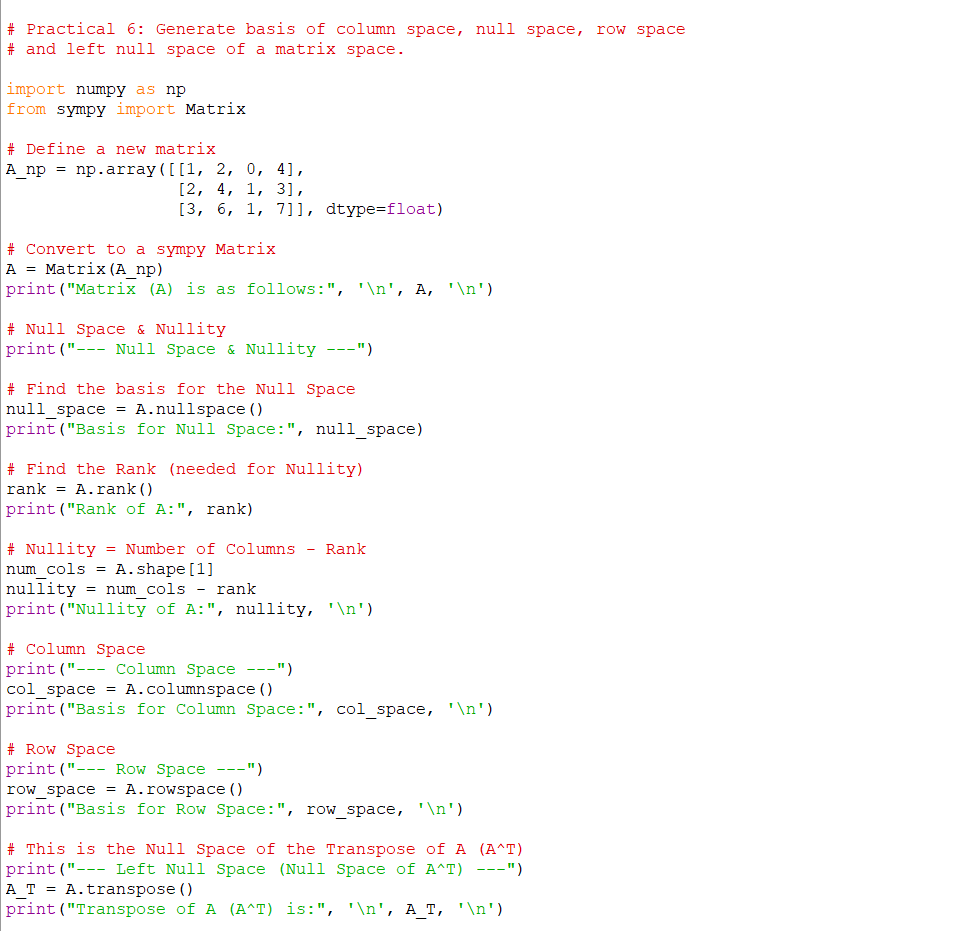
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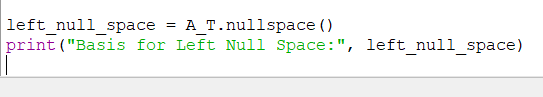


**# Practical 6**

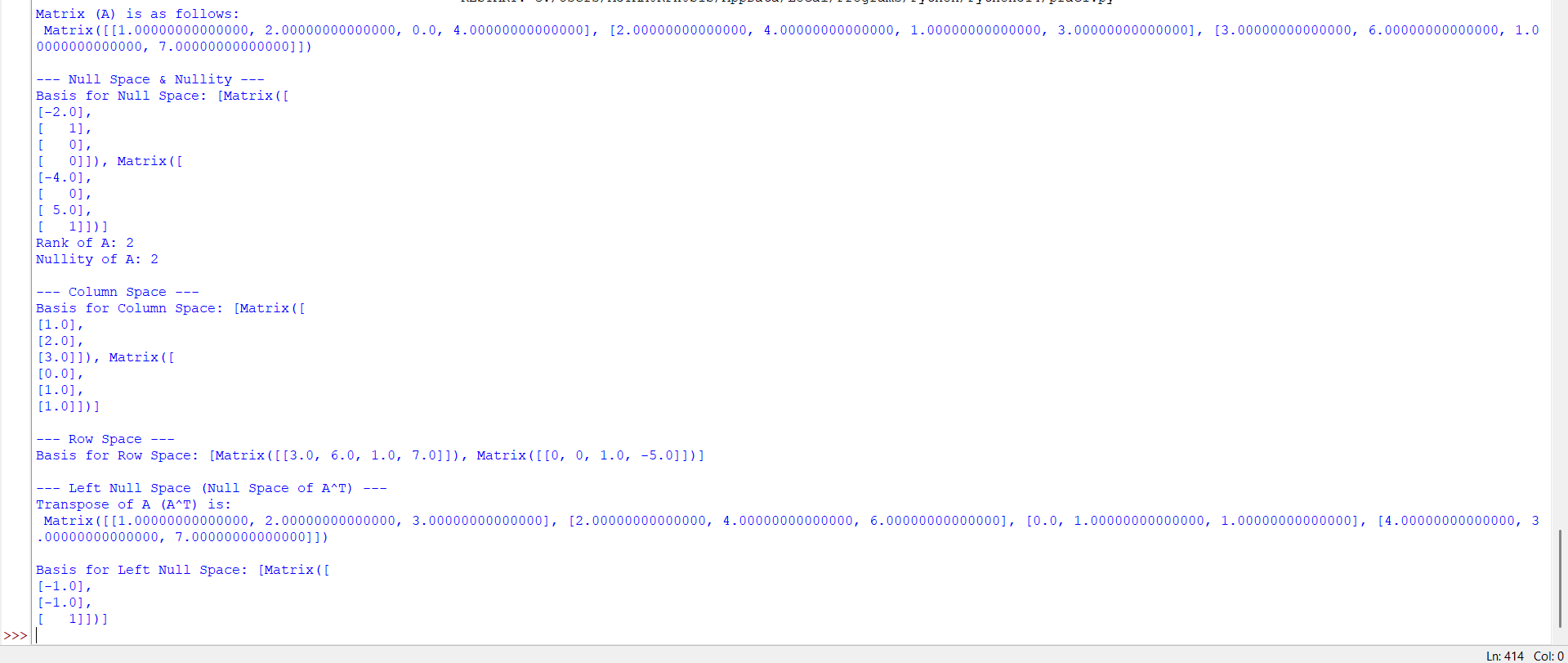
**Generate basis of column space, null space, row space and left null space of a matrix space.**

**Code:-**

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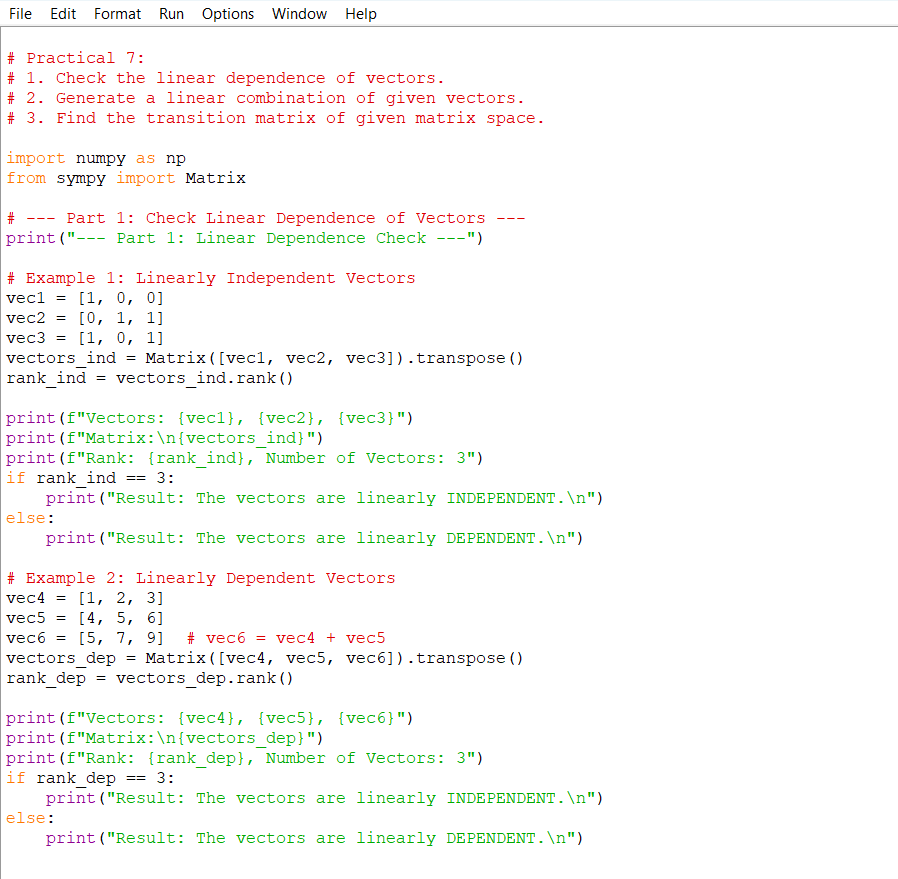
**Output:-**

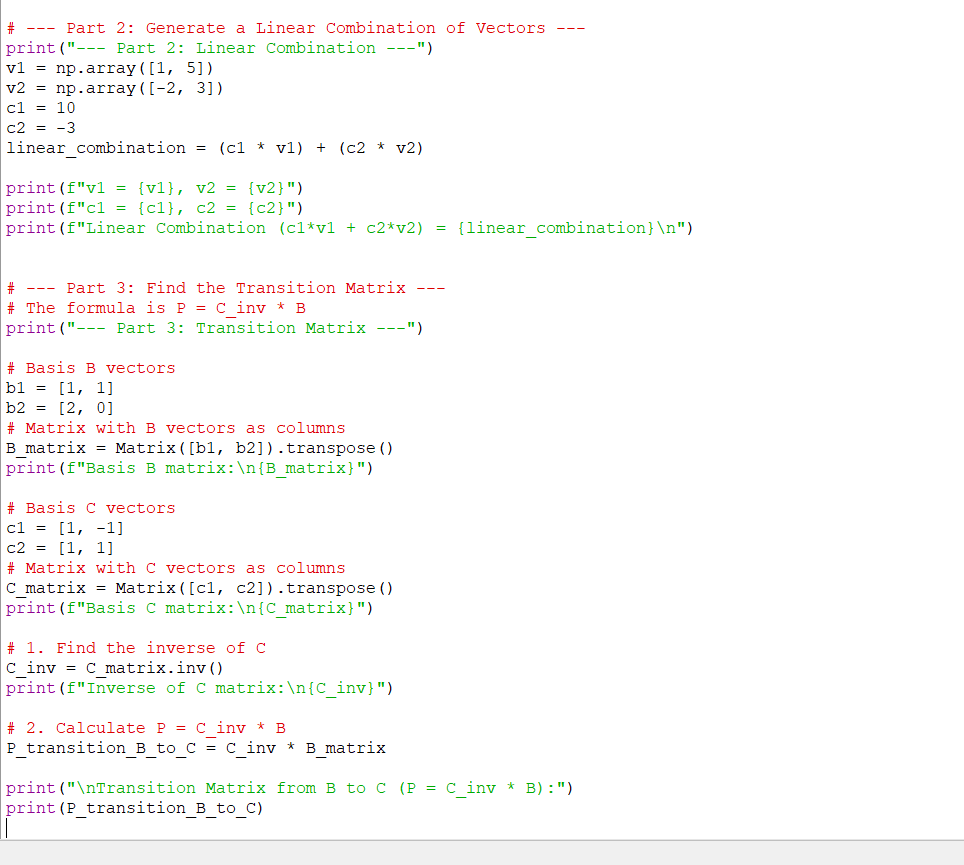


**# Practical 7**

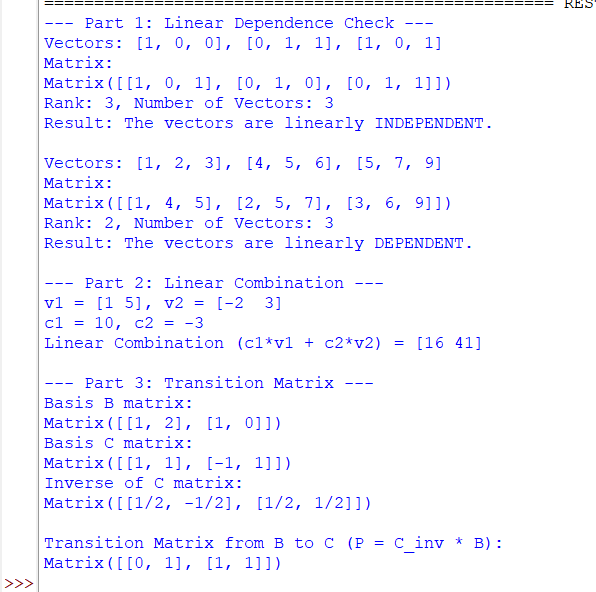
**Check the linear dependence of vectors. Generate a linear combination of given vectors of Rn/ matrices of the same size and find the transition matrix of given matrix space.**

**Code:**

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**Output:-**

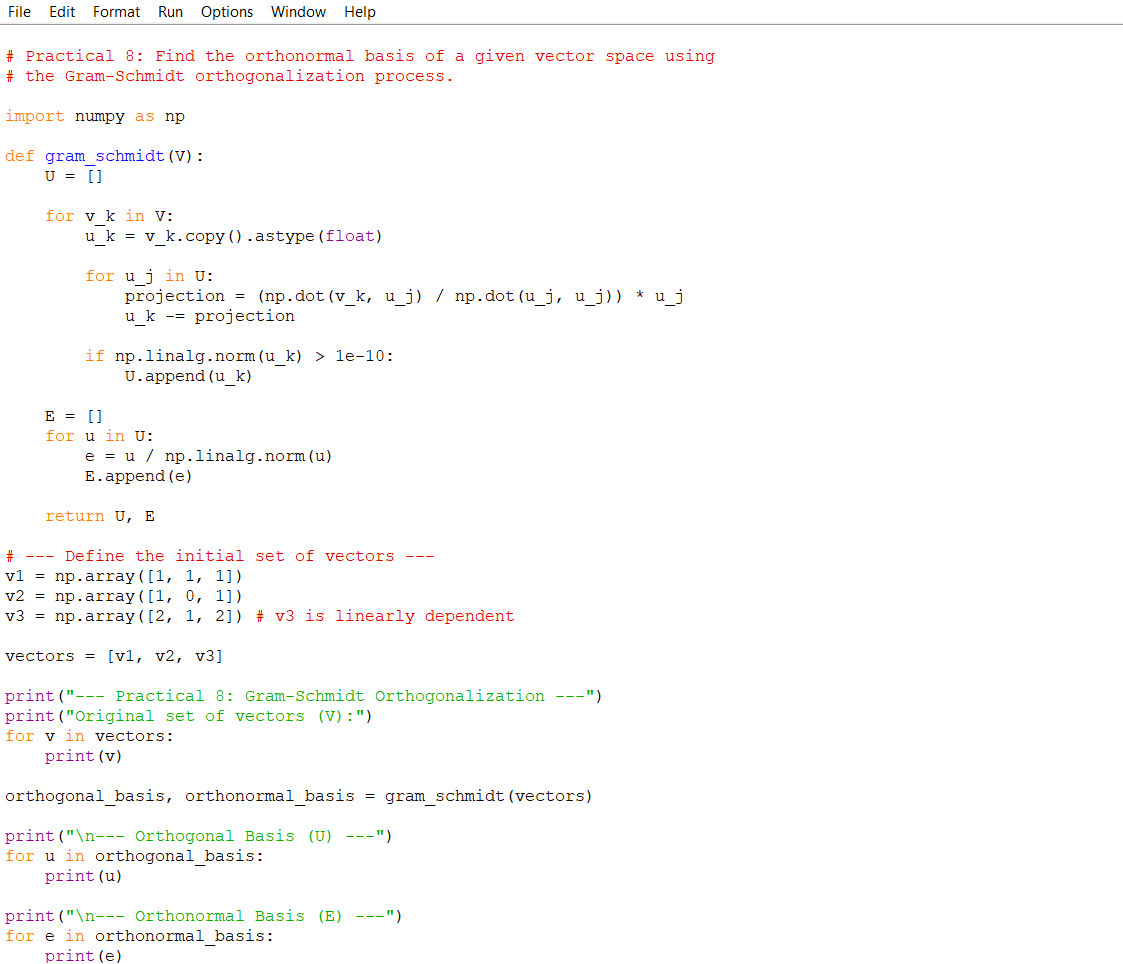
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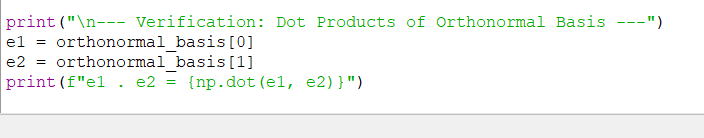
**# Practical 8**

**Find the orthonormal basis of a given vector space using the**

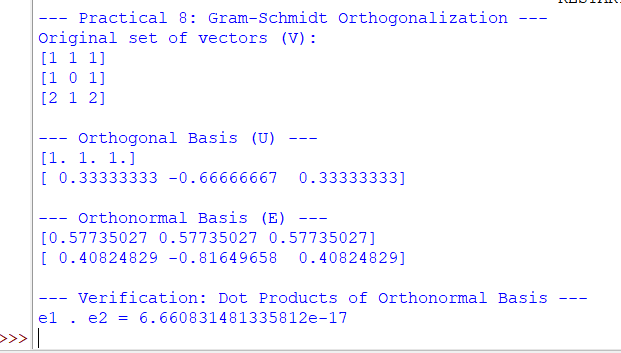
**Gram-Schmidt orthogonalization process.**

**Code:-**

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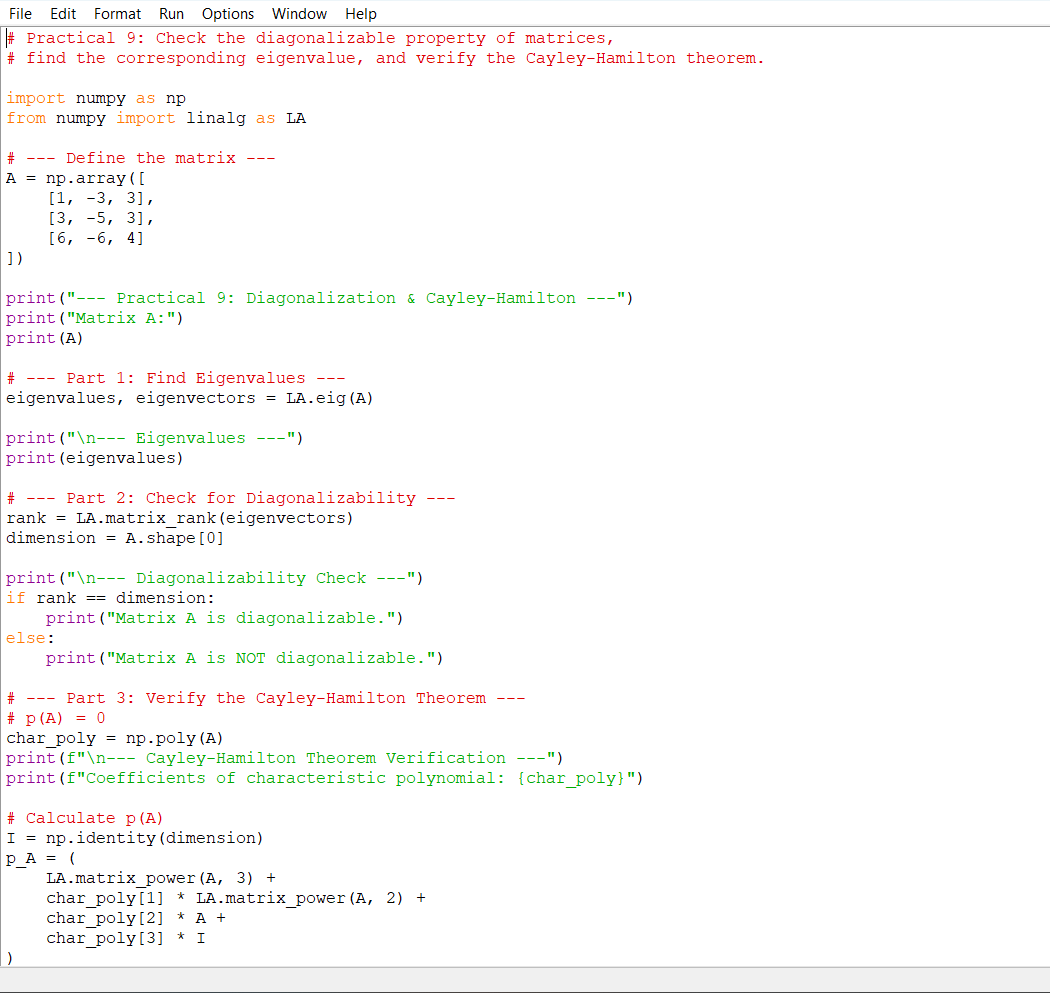
**Output:-**

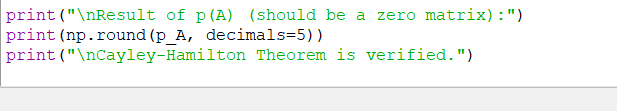
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**# Practical 9**

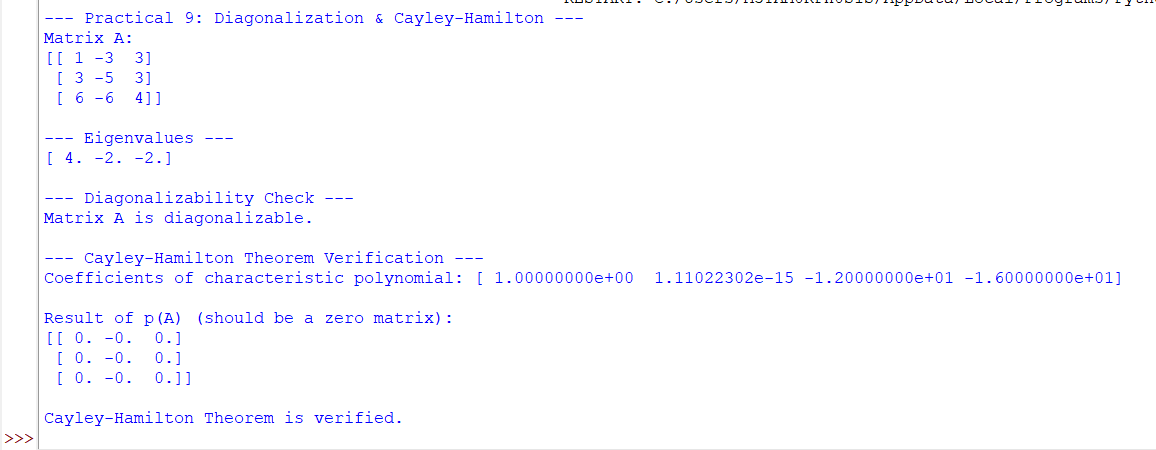
**Check the diagonalizable property of matrices and find the corresponding eigenvalue and verify the Cayley- Hamilton theorem**

**Code:-**

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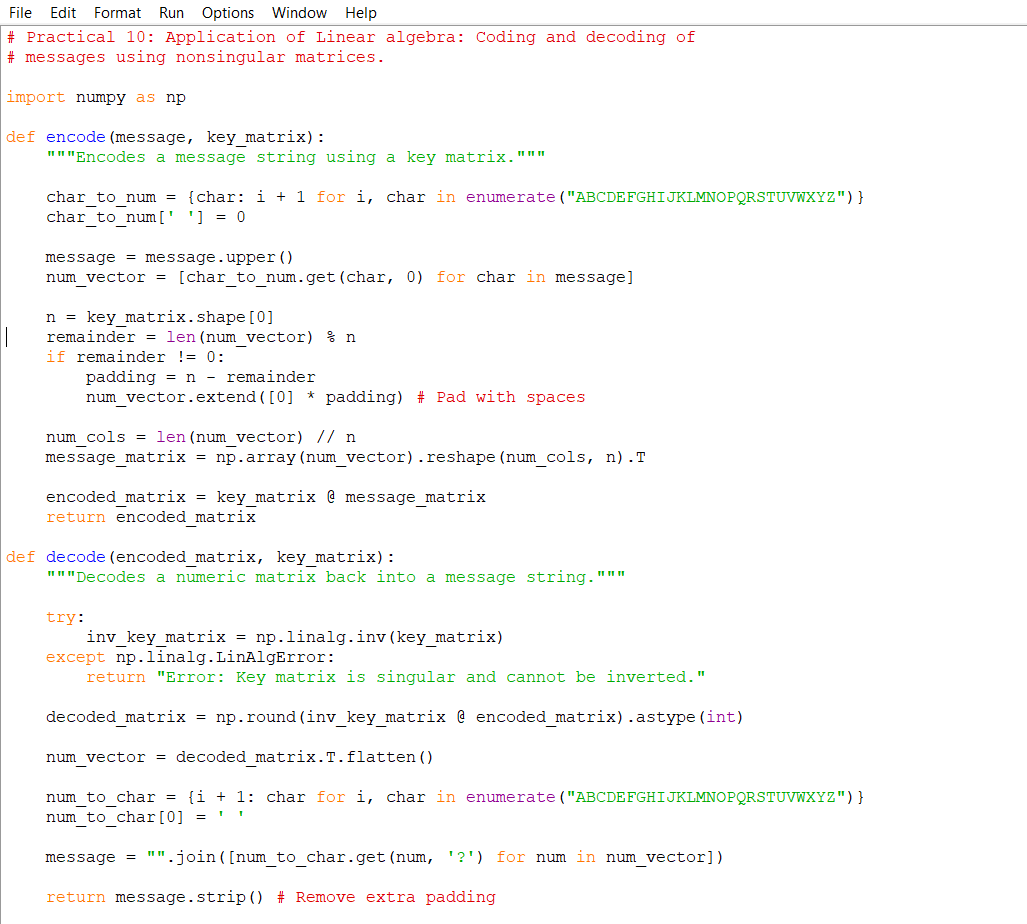
**Output:-**

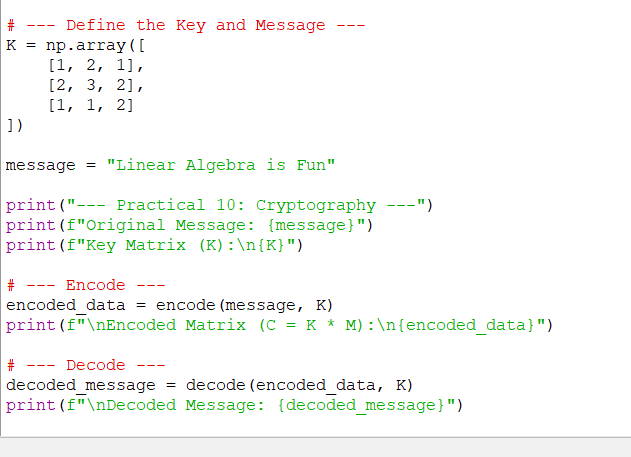
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**# Practical 10**

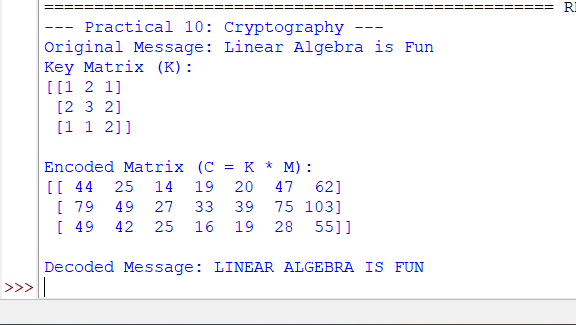
**Application of Linear algebra: Coding and decoding of messages using nonsingular matrices. eg code “Linear Algebra is fun” and then decode it.**

**Code:-**

****

****

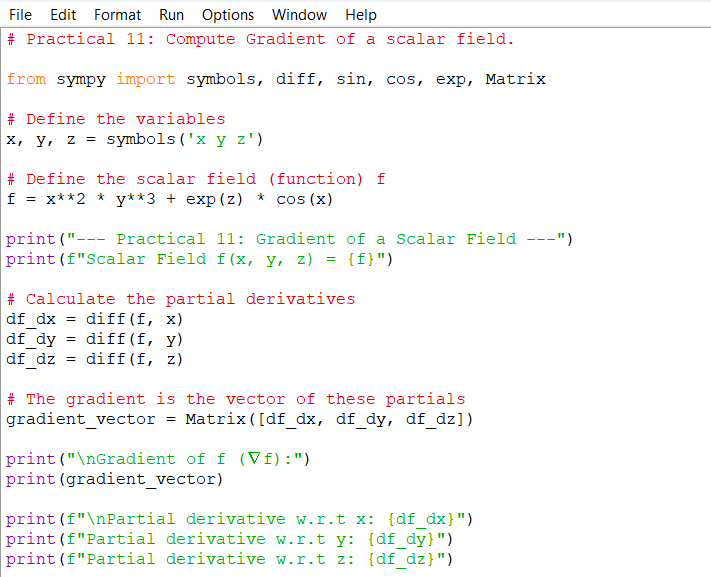
**Output:-**

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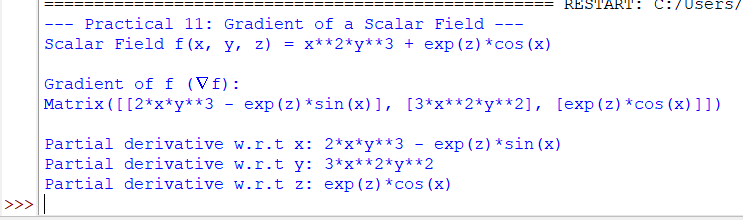
**# Practical 11**

**Compute Gradient of a scalar field.**

**Code:-**

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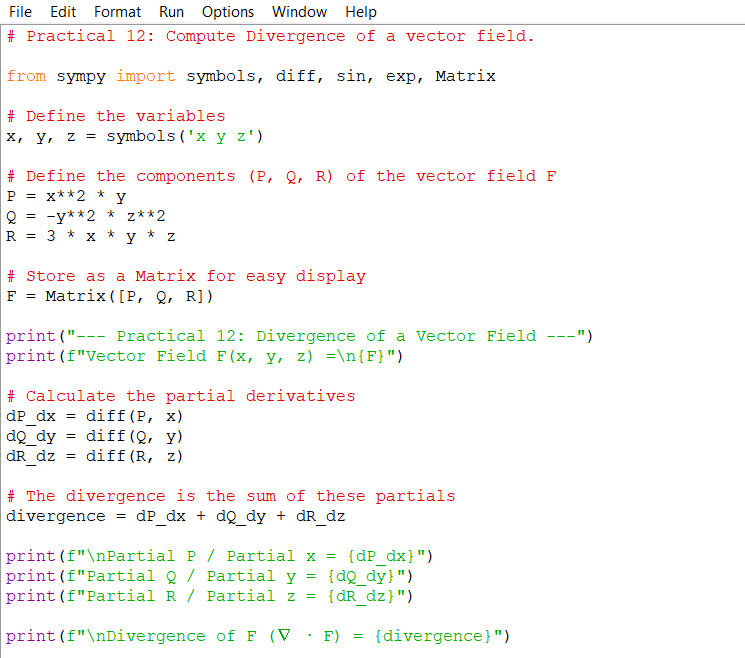
**Output:-**

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**# Practical 12**

**Compute Divergence of a vector field.**

**Code:-**

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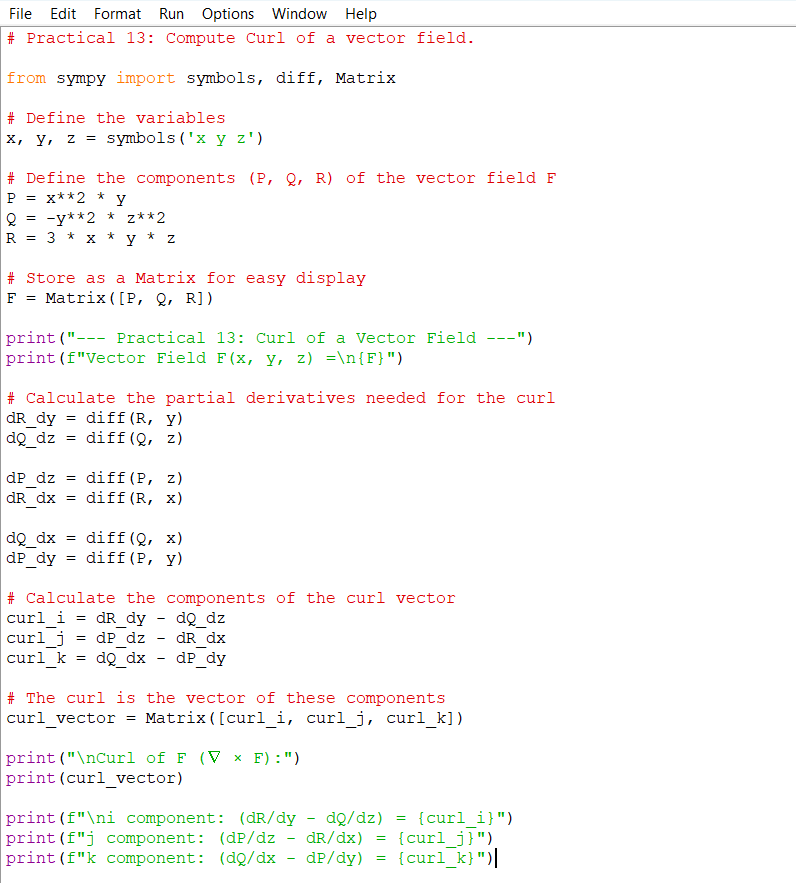
**Output:-**

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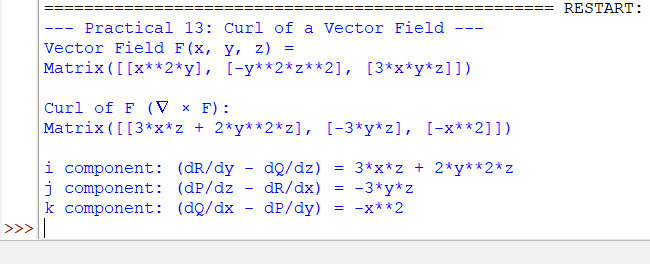
**# Practical 13**

**Compute Curl of a vector field.**

**Code:-**

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**Output:-**

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