# Assignment Two: Python Basics for Linear Algebra

Math 264
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## Objective:

To familiarize yourself with matrix creation, indexing operations, and the special matrices available in the `numpy` library.

## Prerequisites:

- Basic knowledge of Python programming.
- Familiarity with matrix operations in linear algebra.
- Installed `numpy` library.

## Tasks:

### 1. Matrix Creation:

1. Generate a 5x5 matrix with integer elements of your choice.
2. Display this matrix.

### 2. Indexing:

[resume]Extract and display the third row of the matrix. Extract and display the fourth column of the matrix. Access and print the element in the second row and third column. Update the element in the fifth row and first column to zero.

### 3. Special Matrices:

[resume]Construct and display a 4x4 identity matrix. Generate and show a 3x5 zero matrix. Build a 2x3 ones matrix and display it. Create a 3x3 random matrix (elements between 0 and 1) and show it.

### 4. Bonus Task:

[resume]Using the random matrix from the previous task, find all elements greater than 0.5 and replace them with 1, while replacing the others with 0. Display the resulting matrix.

## Instructions:

- Make use of Python's `numpy` library for all tasks.
- Ensure to include comments in your code for clarity.
- Test each task individually to ensure accuracy before moving to the next.

## Submission:

Complete the tasks using Google Colab. Once you've finished, share the link of your Colab notebook with me.

## Additional Resources:

For further reading and clarification on the Python concepts related to this assignment, students can refer to the notes available at this link.