**UIT2502---Data Analytics and Visualization Lab**

**Ex 1 b: Numpy Exercise**

**Name:** Vasundhara.B

**Roll No:** 3122 21 5002 119

1. Write a NumPy program to create an array of 10 zeros, 10 ones, and 10 fives.

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Description automatically generated

1. Write a NumPy program to create a 3x3 identity matrix and stack it vertically and horizontally.

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to test element-wise for complex numbers, real numbers in a given array. Also test if a given number is of a scalar type or not.

A computer screen shot of a black screen

Description automatically generated

1. Write a NumPy program to compute the inner product of two given vectors.

A black screen with white text

Description automatically generated

1. Write a NumPy program to compute the multiplication of two given matrixes.

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Description automatically generated

1. Write a NumPy program to compute the eigenvalues and right eigenvectors of a given square array.

A screen shot of a computer

Description automatically generated

1. Write a NumPy program to compute the determinant of an array.

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to create an 8x8 matrix and fill it with a checkerboard pattern.

A screen shot of a computer

Description automatically generated

1. Write a NumPy program to convert Centigrade degrees into Fahrenheit degrees. Centigrade values are stored in a NumPy array.

A screenshot of a computer screen

Description automatically generated

1. Write a NumPy program to find the union of two arrays. Union will return a unique, sorted array of values in each of the two input arrays.

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Description automatically generated

1. Write a NumPy program to convert cartesian coordinates to polar coordinates of a random 10x2 matrix representing cartesian coordinates.

A screenshot of a computer screen

Description automatically generated

1. Write a NumPy program to sort the student id with increasing height of the students from given students id and height. Print the integer indices that describes the sort order by multiple columns and the sorted data.

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to partition a given array in a specified position and move all the smaller elements values to the left of the partition, and the remaining values to the right, in arbitrary order (based on random choice).

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to extract all the rows to compute the student weight from a given array (student information) where a specific column starts with a given character.

A computer screen shot of a black screen

Description automatically generated

1. Write a NumPy program to compute the histogram of numbers against the bins.

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to compute the mean, standard deviation, and variance of a given array along the second axis.

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Description automatically generated

1. Write a NumPy program to multiply a matrix by another matrix of complex numbers and create a new matrix of complex numbers.

A screen shot of a computer code

Description automatically generated

1. Write a NumPy program to find the roots of the following polynomials. a) x2 - 4x + 7. b) x4 - 11x3 + 9x2 + 11x =10

A computer screen shot of a black screen

Description automatically generated

1. Write a NumPy program to compute the trigonometric sine, cosine and tangent array of angles given in degrees.

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Description automatically generated

1. Write a NumPy program to compute natural, base 10, and base 2 logarithms for all elements in a given array

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to multiply a matrix by another matrix of complex numbers and create a new matrix of complex numbers.

A screen shot of a computer

Description automatically generated

1. Write a NumPy program to find the first Monday in August 2023.

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Description automatically generated

1. Write a NumPy program to get the dates of yesterday, today and tomorrow.

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Description automatically generated

1. Write a NumPy program to remove the leading and trailing whitespaces of all the elements of a given array.
2. Write a NumPy program to split a given text into lines and split the single line into array values.
3. Write a Numpy program to test whether a numpy array is faster than a Python list or not.

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Description automatically generated

1. Write a NumPy program to create a 11x3 array filled with student information (id, class and name) and shuffle the rows of the array starting from 3rd to 9th.

A computer screen shot of a program

Description automatically generated

1. Write a NumPy program to subtract the mean of each row from a given matrix.

A computer screen with numbers and letters

Description automatically generated

1. Write a NumPy program to compute the covariance matrix of two given arrays.

A screenshot of a computer

Description automatically generated

1. Write a NumPy program to create a 5x5 array with random values and find the second-largest value in each row

