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| Course- BTech | Type- Specialization Core |
| Course Code- CSET-214 | Course Name- Data Analysis using Python |
| Year- 2024-25 | Semester- Odd |
| Date- | Batch- |

**Lab # No. (1.1)**

**Data manipulation using numpy and scipy**

**Introduction:** Data manipulation means to organize or arrange the kind of structured data that is read by computer programs so that it's easier to interpret. Performing this process effectively can improve the quality of your data and analysis. **(**<https://www.hackerearth.com/practice/machine-learning/data-manipulation-visualisation-r-python/tutorial-data-manipulation-numpy-pandas-python/tutorial/>)

Create an array and write the given programs.

array1:

67 55 77 69

83 79 92 88

87 93 94 90

84 81 76 77

65 69 59 64

Qus 1. Write a NumPy program to sort an along the first and last axis of array1.

Expected Output:

Text, table

Description automatically generated

Qus 2. Write a program to return a contiguous flattened array. A 1-D array, containing the elements of the array1, is returned. The returned array will have the same type as the input array.

Expected output: [67 55 77 69 83 79 92 88 87 93 94 90 84 81 76 77 65 69 59 64]

Qus 3. Write a NumPy program to redesign array1 with 1 on the border and 0 inside.

Expected Output:

A picture containing text

Description automatically generated

Qus 4. Write a program to returns the indices of the maximum values of array1 along an axis 1.

Expected output:

array([2, 2, 2, 0, 1])

Qus 5. Write a program to replace the elements > 70 and < 80 using the following syntax array1[(array1 > 70) & (array1 < 80)] = -1

Expected Output:

Calendar

Description automatically generated

Qus 6. In exam hall, students are sitting in 5 rows and 4 columns (array1). Access the students roll number of the first and last row.

Expected Output:

A screenshot of a computer

Description automatically generated with low confidence