

## Numpy Assignment 3

Q1. Write a python program which takes dictionary as an input and convert it into a numpy array.

Q2. Given a 3D array x of shape (2, 3, 4) and a 2D array y of shape (3, 4). Write a NumPy program to add them using broadcasting.

Q3. Write a python program which finds the nearest element in the array to a given integer.

Inputs: a=23 and array - [10 17 24 31 38 45 52 59].

Expected Output: Nearest element is 24

Q4. Write a python program to replace multiples of 3 or 5 as 0 in the given array.

Input: arr=[1 2 3 4 5 6 7 9]

Expected Output: [1 2 0 4 0 0 7 0]

Q5. Solve the give problem using fancy Indexing:

1. Double the array elements at given indexes

Given:

```
arr = np.arange(10)
```

```
indexes = [0,3,4,9]
```

Expected Output: [ 0 1 2 6 8 5 6 7 8 18]

2. Using a given array make a different array as in below example

Given:

```
array = [1,2,3]
```

```
result array -> [1 1 1 2 2 2 3 3 3]
```

- Internal repetition should be as length of the array.

Q6. You are given an array which is having some nan value. Your job is to fill those nan values with mean element in the array.

```
Given: arr = np.array([[1,2,np.nan],[4,2,6],[np.nan,np.nan,5]])
```

Q7. **Scenario:** A sports team tracks player performance across 12 matches.

Task: Create a (12, 5) array with random integers (0 to 100, representing scores). Mask the values where the player's score is less than the team's average score for that match. Replace these values with -1.

Expected Output Example: Array with some values replaced by -1.

Q8. **Scenario:** A business tracks monthly revenue and expenses for 3 departments across 6 months.

Task: Create two (3, 6) random matrices for revenue and expenses. Perform element-wise multiplication and sum along the row axis to calculate the total profit for each department.

Expected Output Example: A 1D array with the total profit per department.

Q9. **Scenario:** A 5x5 matrix represents pixel intensity values in an image.

Task: Rotate the matrix 90 degrees anti-clockwise without using loops or Python slicing.

Expected Output Example: A rotated matrix.

Q10. **Scenario:** A company tracks salaries of 15 employees in 3 departments.

Task: Create a (3, 15) matrix of random salaries. Identify and print the department(s) where all employees have salaries above ₹50,000. Replace salaries less than ₹30,000 with the department's average salary.

Expected Output Example: Original Salary matrix and Updated salary matrix.