Keshav Mahavidyalaya

B.Sc. (H) Computer Science - III Sem (Section A+B)

DSE-I Data Analysis and Visualization (DAV)

Assignment 1

1. What factors should you consider when deciding whether to use NumPy or Python lists for a specific task?Can you provide examples of tasks that are best suited for NumPy, and others for which Python lists are sufficient?.
2. Explain Broadcasting in numpy and Create 2 dimension array with user input and validate for implementation of broadcasting on arithmetic operation (+,-,*,/,%). Show proper results on every operation.
3. Explain and Calculate inner, outer, and cross products of matrices and vectors using NumPy

4. Create a 2 dimensional array of square matrix and display of diagonal elements and also update diagonal elements with user input without using any loop.

5. Create a 3 dimensional array and print all elements in O(n) complexity.

6. Create a 2 dimensional array using user input and change it into scalar matrix and identity matrix.
7. Explain Inferential statistics and Descriptive statistics.

   Data

   ```
   import random
   random.seed(0)
   salaries = [round(random.random()*1000000, -3) for _ in
   range(100)]
   ```

8. Using the **data**, calculate the following statistics without importing anything from the statistics module in the standard library and then confirm your results match up to those that are obtained when using the statistics module (where possible):
   - Mean
   - Median
   - Mode
   - Sample variance
   - Sample standard deviation
9. Using the **data**, calculate the following statistics using the functions in the statistics module where appropriate:
   - Range
   - Coefficient of variation
   - Interquartile range

- Quartile coefficient of dispersion

10. Scale the data created in **data** using the following strategies:
    - Min-max scaling (normalising)
    - Standardising