**Python Advanced Assignment 23**

Q1. If you have any, what are your choices for increasing the comparison between different figures on the same graph?

Ans-) There are several choices to increase comparison between different figures on the same graph:

* Using different colors or patterns for each figure
* Using different markers or line styles for each figure
* Using a legend to label each figure
* Using axis labels and titles to provide context for the figures
* Using annotations or text to highlight specific points or regions within the figures

Q2. Can you explain the benefit of compound interest over a higher rate of interest that does not

compound after reading this chapter?

Ans-) Compound interest refers to interest that is calculated on both the principal amount and any accumulated interest from previous periods. The benefit of compound interest over a higher rate of interest that does not compound is that it allows for exponential growth of the investment over time. As the interest is added to the principal and then earns interest itself, the investment grows at an increasing rate. This can lead to significant growth in the long run, even with a relatively low interest rate. In contrast, a higher rate of interest that does not compound will only earn interest on the principal amount, and the growth of the investment will be more linear over time.

Q3. What is a histogram, exactly? Name a numpy method for creating such a graph.

Ans-) A histogram is a graphical representation of the distribution of a dataset. It is a bar plot where the bars represent intervals of values and the height of each bar represents the number of data points within that interval. A histogram can provide insight into the shape, spread, and central tendency of a dataset.

Numpy provides a method for creating histograms called numpy.histogram(). This method takes an array of data and returns the frequency of values within a set of bins. The bins represent intervals of values that the data is divided into, and the frequency represents the number of data points within each bin. The resulting histogram can be visualized using Matplotlib, which is a plotting library that works closely with Numpy.

Q4. If necessary, how do you change the aspect ratios between the X and Y axes?

Ans-) To change the aspect ratios between the X and Y axes, you can use the aspect parameter in the matplotlib.pyplot library. For example, plt.gca().set\_aspect('equal') will set the aspect ratio to be equal for both X and Y axes.

Q5. Compare and contrast the three types of array multiplication between two numpy arrays: dot

product, outer product, and regular multiplication of two numpy arrays.

Ans-) The three types of array multiplication between two numpy arrays are:

Regular multiplication: This is element-wise multiplication, where the corresponding elements of the two arrays are multiplied together.

Dot product: This is a mathematical operation that takes two vectors and returns a scalar. In numpy, it is represented by the dot() function.

Outer product: This produces a matrix where each element is the product of two corresponding elements from the two arrays. In numpy, it is represented by the outer() function.

Q6. Before you buy a home, which numpy function will you use to measure your monthly mortgage

payment?

Ans-) To measure your monthly mortgage payment, you can use the numpy.pmt() function. It takes three arguments: the interest rate, the number of periods, and the present value of the loan. For example, numpy.pmt(0.05/12, 12\*30, 200000) will give you the monthly payment for a 30-year mortgage with a 5% annual interest rate and a principal of $200,000.

Q7. Can string data be stored in numpy arrays? If so, list at least one restriction that applies to this

Data

Ans-) Yes, string data can be stored in numpy arrays using the numpy.char module. However, there are some restrictions to this data:

* The length of the strings must be fixed, meaning that all strings in the array must have the same length.
* The maximum length of the strings must be specified when creating the array.
* The array must be of a specific data type, such as numpy.chararray or numpy.string\_.

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