

Sessional - III

Basics of IT Workshop

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August 22, 2023

1. Use list comprehension to create the mathematical table for a number N.
2. Use list comprehension to find which numbers from 1 to 1000 are *Perfect Numbers*.
3. Use list comprehension to find how many multiples of 11 exist between 1 to 1000.
4. Use list comprehension to find the smallest 5 digit prime.
5. Write a program to simulate the throwing of an unbiased dice 1000000 times. How would you justify that the outcome is unbiased?
6. How many times does each digit occur in the factorial of 100?
7. You are provided with a list of tuples [("JH", "Ranchi"), ("WB", "Kolkata"), ("BH", "Patna"), ("MH", "Mumbai")]. Write a code to dissociate this into a list containing two lists where the first list contains only the names of the states and the second list contains the name of the capitals.
8. A dataset contains a column called "Class Labels". There are only three possible values for the column i.e. 1,2,3. Given that there are 20 records in the data set, create a *One Hot Encoded* representation of the class label attribute.
9. The normal function is defined as

$$f(x|\mu) = Ae^{-(x-\mu)^2/B}$$

- , where A and B are two constants. Calculate the probability of a value x where x ranges from -100 to 100 in steps of 0.1. In case the value of the mean is 0, how many points in the total range have a probability more than 66% of the peak probability. Create a new list marking all such points as 1 and all other points as zero.
10. The inaugural address by President Biden can be found at <https://www.presidency.ucsb.edu/documents/inaugural-address-53>. Copy it into your notebook as a triple quoted string. If we the set of articles is ["a", "an", "the"]. Create a dictionary containing how many times each article occurred in the text.