



## DSECLPFDS/AIMLCPFDS

### Python Exercises for Practice (Topics S1 and S2)

*Instructions: Do not use any Python libraries and write the following codes from scratch for best learning/ revision.*

1. Given a number, find the sum of its digits. Take the number as an input from the user.
2. Given a number, check whether the given number is an Armstrong number or not. A positive integer is called an Armstrong number of order n if:

$$abcd... = a^n + b^n + c^n + d^n + ...$$

$$\text{Example: } 153 = 1*1*1 + 5*5*5 + 3*3*3$$

153 is an Armstrong number of order 3.

Inputs from the user will be number and order n.

3. Given a string, write a python function to check if it is palindrome or not. A string is said to be palindrome if the reverse of the string is the same as string. For example, “malayalam” is a palindrome, but “music” is not a palindrome.

4. Given an array which may contain duplicates, print all elements and their frequencies.
5. Given a number  $n$ , write a function to print all [prime factors](#) of  $n$ . For example, if the input number is 12, then output should be “2 2 3”.
6. Given two numbers  $n$  and  $r$ , find the value of  ${}^nC_r$  (binomial coefficient:  ${}^nC_r = (n!) / (r! * (n-r)!)$ )
7. Searching: Given a sorted array `arr[]` of  $n$  elements, write a function to search a given element  $x$  in `arr[]`. Do it using linear and binary search techniques.
8. Input a text file (containing 1 or more paragraphs of English text) from the user, parse this file to display the frequency of occurrence of each word in this text file. Find the 3 most frequent words as well.
9. Define a tuple with the names of three countries. Write a program that prints each country's name along with its length.
10. Create a program that prompts the user to enter a list of names. Then, display the list in alphabetical order.

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