



PYTHON PROGRAMMING





Basic Syntax & IO

1. Print "Hello, World!"
2. Take user input and print it
3. Swap two variables
4. Check if a number is even or odd
5. Find the largest of two numbers



Operators

1. Perform arithmetic operations (+, -, *, /, %, **), take any values as "a" and "b"
2. Calculate the square and cube of a number
3. Convert Celsius to Fahrenheit ($F = (C * 9/5) + 32$)
4. Convert kilometers to miles (1 km = 0.621371 miles)
5. Check if a number is positive, negative, or zero



Conditional Statements

1. Find the largest of three numbers.
2. Check if a year is a leap year. A leap year is a year that is divisible by 4, but if it is a century year (divisible by 100), it must also be divisible by 400 to be a leap year.
3. Check if a character is a vowel or consonant
4. Write a Python program to assign the grades to each subject based on the grade scale:

Student subject marks:

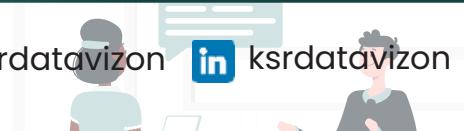
- maths = 85
- science = 78
- english = 92

Grade scale:

- A: 90-100
- B: 80-89
- C: 70-79
- D: 60-69
- E: 50-59
- F: Below 50



5. Write a program to check if a number is divisible by both 5 and 11





Loops

1. Print numbers from 1 to the given number N
2. Print even numbers up to the given number N
3. Sum of first N natural numbers ($\text{sum} = n * (n+1) / 2$)
4. Calculate the factorial of a number ($n! = n \times (n-1) \times \dots \times 1$) without using def function
5. Print multiplication table of a number

Example:

- $2 * 1 = 2$
- $2 * 2 = 4$



Strings

1. Write a program to Reverse a given string (at least 2 ways)
2. Count the number of vowels in a string
3. Check if a string is a palindrome
4. Convert uppercase to lowercase and vice versa
5. Find the length of a string without using len() function



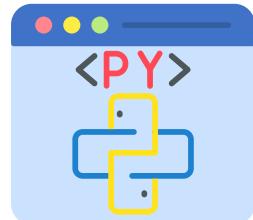
Lists

1. Find the largest element in a list
2. Find the smallest element in a list
3. Find the sum of elements in a list
4. Sort a list in ascending order
5. Remove duplicates from a list



Tuples

1. Find the maximum and minimum number in a tuple
2. Convert a tuple to a list
3. Count occurrences of an element in a tuple
4. Find the index of an element in a tuple
5. Reverse a tuple





Sets

1. Create empty set
2. Perform union of two sets
3. Perform intersection of two sets
4. Perform difference of two sets
5. Check if a set is a subset of another
6. Remove an element from a set



Dictionaries

1. Create a dictionary and print keys & values
2. Find the sum of dictionary values
3. Merge two dictionaries
4. Sort a dictionary by its values
5. Count the occurrences of elements in a dictionary



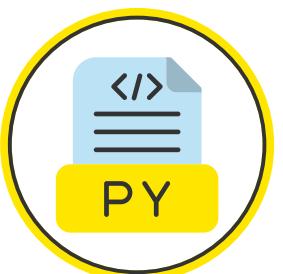
Mathematical Programs



1. Check if a number is prime or not
2. Find the sum of digits of a number (eg: input: 1234 and output: 10)
3. Find the LCM of two numbers
4. Find the GCD of two numbers



Functions



1. Define a function to find the sum of two numbers
2. Define a function to return the square of a number
3. Define a function with default arguments
4. Define a function with variable-length arguments
5. Define a function that returns multiple values



Lambda Functions

1. Use a lambda function to add two numbers
2. Use a lambda function to find the maximum of two numbers
3. Use a lambda function to square a number
4. Use a lambda function inside map()
5. Use a lambda function inside filter()



List Comprehensions

1. Generate a list of squares using list comprehension
2. Generate a list of even numbers using list comprehension
3. Reverse a list using list comprehension
4. Flatten a nested list using list comprehension
5. Find common elements in two lists using list comprehension



Miscellaneous

1. Swap two numbers without using a third variable
2. Count occurrences of each word in a sentence
3. Find the second largest number in a list
4. Check if two strings are anagrams
5. Print Pascal's Triangle



Thank You



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