

Indian Institute of Information Technology Vadodara

Lab Assignment 1

CS162: Introduction to Data Structures Laboratory

Basic Problem using Mathematics Concepts

Create a class with following methods (**Don't use inbuilt math library while implementing**):

1. division(int, int)
2. gcd(int, int)
3. lcm(int, int)
4. power(int, int)
5. max(int[])
6. min(int[])
7. abs(int)
8. factorial(int)
9. sum(int[]) (e.g. sum[1, 7, 3] output:- $1+7+3 = 11$)
10. sumOfDigits(int) (e.g. sumOfDigits(4785) output:- $4+7+8+5 = 24$)
11. sqrt(int) (Note:- Don't use `Math.sqrt()`)
12. isPrime(int)
13. isLeapYear(int)
14. isPalindrome(int)
15. isArmstrong(int)
16. ArithmeticSequenceSum(int a, int d, int n)
 - "a" as the first term.

- “d” the common difference between the terms.
- “n” is the total number of terms in the sequence.

17. GeometricSequenceSum(int a, int r)

- “a” as a start term.
- “r” as a common ratio.

Array Problems

1. Linear Search (return an index of element if found otherwise return -1)
2. Reverse the array
3. Find maximum absolute difference. (hint: absolute difference of min and max)

Matrix Problems

1. Addition of two matrices.
2. Multiplication of two matrices.

String Problems

1. Check whether a string is palindrome.
2. Check whether a string contains only numbers (isNumeric).
3. Check whether two strings are equal.
4. Sort the characters in a string.
5. Check whether two strings are anagram.
6. Count single occurring characters in a string.
7. Binary to decimal conversion and vice versa.

Problems based on patterns

1. Right angle triangle pattern. (for n = 5 rows)

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