

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(Autonomous)

Subject: Advanced Coding 1

Year & Branch :II-II B.tech CSD

Faculty: V Jyotsna Devi

Academic Year: 2024-25

Sl no.	Date	Experiment	Remarks
1	09/01/2025	<p>1. Given a letter X. Determine whether X is Digit or Alphabet and if it is Alphabet determine if it is Capital Case or Small Case. Note: Digits in ASCII '0' = 48, '1' = 49etc Capital letters in ASCII 'A' = 65, 'B' = 66etc, Small letters in ASCII 'a' = 97, 'b' = 98etc</p> <p>2. Given two numbers X, Y which donate coordinates of a point in 2D plan. Determine in which quarter does it belong. Note: Print Q1, Q2, Q3, Q4 according to the quarter in which the point belongs to. Print "Origem" If the point is at the origin. Print "Eixo X" If the point is over X axis. Print "Eixo Y" if the point is over Y axis.</p> <p>3. Given a number N. Print 2 lines that contain the following respectively: a) Print N in a reversed order and not leading zeroes. b) If N is a palindrome number print "YES" otherwise, print "NO."</p>	
2	23/01/2025	<p>1. Given an array of positive integers arr[], return the second largest element from the array. If the second largest element doesn't exist then return -1.</p> <p>2. Given two numbers N and M, a 2D array A of size N * M which contains 'x' or '.' only and two numbers X, Y which donates a cell position in A such that X is the row number and Y is the column number. Determine whether all neighbors of the given cell are 'x' or not.</p> <p>3. Given an array A of size N. Print the array elements after shifting all zeroes in array A to the right.</p>	
3	30/01/2025	<p>1. You have to create a class, named <i>Student</i>, representing the student's details like, <i>age (int)</i>, <i>first_name (string)</i>, <i>last_name (string)</i> and <i>standard (int)</i>. and store the data of a student. Create setter and getter functions for each element, that is, the class should at least have following functions:</p> <ul style="list-style-type: none"> • <i>get_age, set_age</i> • <i>get_first_name, set_first_name</i> • <i>get_last_name, set_last_name</i> • <i>get_standard, set_standard</i> <p>Also, you have to create another method <i>to_string()</i> which returns the string consisting of the above elements, separated by a comma(.).</p> <p>2. Create a class named <i>Student</i> with the following specifications:</p> <ul style="list-style-type: none"> • An instance variable <i>scroes</i> to hold a student's 5 exam scores. • A <i>void input()</i> function that reads integers and saves them to <i>scroes</i> . • An <i>int calculateTotalScore()</i> function that returns the sum of the student's scores. <p>3. Design a class named <i>Box</i> whose dimensions are integers and private to the class. The dimensions are labelled: length l , breadth b , and height h .</p>	

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		<p>The default constructor of the class should initialize l ,b , and h to 0 . The parameterized constructor <i>Box(int length, int breadth, int height)</i> should initialize <i>Box's</i> l,b and h to length, breadth and height. The copy constructor <i>Box(Box B)</i> should set l,b and h to B's l, b and h, respectively.</p> <p>Apart from the above, the class should have functions:</p> <ul style="list-style-type: none"> • <i>int getLength()</i> - Return box's length • <i>int getBreadth()</i> - Return box's breadth • <i>int getHeight()</i> - Return box's height <p><i>long long CalculateVolume()</i> - Return the volume of the box</p>	
4	06/02/2025	<p>1. Create class <i>Triangle</i> has a function called <i>triangle ()</i>. Now we create a class derived from the base class <i>Triangle</i> called <i>Isosceles</i>. Create a derived class object and use it to access the functions of the base class. Write a function in <i>Isosceles</i> class such that the output is as given below. I am an isosceles triangle. In an isosceles triangle two sides are equal. I am a triangle.</p> <p>2. Create three classes <i>Person</i>, <i>Professor</i> and <i>Student</i>. The class <i>Person</i> should have data members name and age. The classes <i>Professor</i> and <i>Student</i> should inherit from the class <i>Person</i>. The class <i>Professor</i> should have two integer members: <i>publications</i> and <i>cur_id</i>. There will be two member functions: <i>getdata</i> and <i>putdata</i>. The function <i>getdata</i> should get the input from the user: the <i>name</i>, <i>age</i> and <i>publications</i> of the professor. The function <i>putdata</i> should print the <i>name</i>, <i>age</i>, <i>publications</i> and the <i>cur_id</i> of the professor. The class <i>Student</i> should have two data members: <i>marks</i>, which is an array of size 6 and <i>cur_id</i>. It has two member functions: <i>getdata</i> and <i>putdata</i>. The function <i>getdata</i> should get the input from the user: the <i>name</i>, <i>age</i>, and the <i>marks</i> of the student in 6 subjects. The function <i>putdata</i> should print the <i>name</i>, <i>age</i>, <i>sum</i> of the marks and the <i>cur_id</i> of the student. For each object being created of the <i>Professor</i> or the <i>Student</i> class, sequential id's should be assigned to them starting from 1.</p> <p>3. Given an abstract base class <i>Cache</i> with member variables and functions: <i>mp</i> - Map the key to the node in the linked list <i>cp</i> - Capacity <i>tail</i> - Double linked list tail pointer <i>head</i> - Double linked list head pointer <i>set()</i> - Set/insert the value of the key, if present, otherwise add the key as the most recently used key. If the cache has reached its capacity, it should replace the least recently used key with a new key. <i>get()</i> - Get the value (will always be positive) of the key if the key exists in the cache, otherwise return -1.</p>	

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		You have to write a class <i>LRUCache</i> which extends the class <i>Cache</i> and uses the member functions and variables to implement an LRU cache.	
5	27/02/2025	<p>1. Valid Parentheses: Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.</p> <p>2. Intersection of Two Arrays: Given two integer arrays nums1 and nums2, return an array of their intersection. Each element in the result must be unique and you may return the result in any order.</p> <p>3. Next Greater Element I: You are given two distinct 0-indexed integer arrays nums1 and nums2, where nums1 is a subset of nums2. Determine the next greater element of nums2[j] in nums2. If there is no next greater element, then the answer for this query is -1. Return an array ans of length nums1.length such that ans[i] is the next greater element.</p>	
6	06/03/2025	<p>1. Given an array A of size N. The elements of the array consist of positive integers. You have to find the largest element with minimum frequency.</p> <p>2. Given a list of N words. Count the number of words that appear exactly twice in the list.</p> <p>3. You are given two strings of the same length s and t. In one step you can choose any character of t and replace it with another character. Return <i>the minimum number of steps</i> to make t an anagram of s. (Leetcode 1347)</p>	
7	13/03/2025	<p>1. Two Sum-II (Leetcode 167) Return <i>the indices of the two numbers</i>, index₁ and index₂, added by one such that numbers[index1]+numbers[index2]=target.</p> <p>2. Find the length of the non duplicates elements in given integer array.(Leetcode 26)</p> <p>3. Rotate Array(Leetcode 189) Given an integer array nums, rotate the array to the right by k steps, where k is non-negative.</p>	
8	20/03/2025	<p>1. Max Consecutive Ones II: Given a binary array, find the maximum number of consecutive 1s in this array if you can flip at most one 0.</p> <p>2. Longest Substring Without Repeating Characters: Given a string s, find the length of the longest substring without duplicate characters.</p> <p>3. Find All Anagrams in a String: Given two strings s and p, return an array of all the start indices of p's anagrams in s. You may return the answer in any order.</p>	
9	27/03/2025	<p>1. Implement a C++ program to find the largest prime factor of an integer.</p> <p>2. Implement a C++ program to find the number of prime numbers that</p>	

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		are strictly less than n. 3. Total Chocolates-II: Find the sum of the all distinct prime factors of each number in the given array, for the given T no.of testcases where each test case consist of number of elements N , followed by N elements of the array.	
10	03/04/2025	1. Implement a C++ program to find the count of set bits in an integer. 2. Given an array of size of N , the elemtns of the arry in the range 0-N . find the missing number. 3. Given array of size $2*N+2$, in which every element repeat twice except 2. Find those two non repeated numbers. 4. Implement a C++ program to count the number of bits needed to be flipped to convert A to B to check if it is a power of 2.	