PATTERNS AND FUNCTIONS-> Week 2

l1

HOMEWORK

~~solid square pattern~~

~~hollow square pattern~~

~~hollow inverted half pyramid~~

~~hollow full pyramid~~

~~numeric hollow half pyramid~~

~~numeric hollow inverted half pyramid~~

numeric palindrome equilateral pyramid

fancy pattern #1

solid half diamond

fancy pattern #3

fancy pattern #2

floyd's triangle pattern

pascal's triangle pattern

butterfly pattern

l3

~~functions~~

~~why functions~~

~~funtion call stack~~

~~pass by value concept~~

~~functions order~~

~~declaration and definition of functions~~

write a function for :-

printing Babbar n times

add 2 numbers

maximum number from 3 numbers

counting from 1 to n

student and grade problem

sum of all numbers upto n

sum of even numbers upto n

meaning of return 0, 1, -1 in c++

https://www.geeksforgeeks.org/return-0-vs-return-1-in-c/

parameters in main function

https://www.ibm.com/docs/en/zos/2.2.0?topic=functions-main-function

write a function to

display area of circle

find number is even or odd

find factorial of a number

prime number or not

print all prime numbers from 1 to n

reverse an integer

set ith bit

convert celsius to Fahrenheit

ARRAYS -> Week 3

l1

~~declaration~~

~~initialization~~

~~making array at runtime~~

~~index and access in array~~

~~taking input in array~~

~~take n elements and print their doubles~~

~~make all items of an array to 1~~

~~functions and array~~

~~linear search function~~

~~linear search without function~~

~~count 0s and 1s in array~~

~~maximum number in an array~~

~~minimum number in an array~~

~~print extremes of an array~~

~~reverse an array~~

HOMEWORK

memset function use and apply in C++

initialize all array values with 0 or -1 (not work on other values)

memset(arr, o/-1, sizeof(arr));

https://www.geeksforgeeks.org/memset-in-cpp/

sizeof(arr);

initially 0

3 ways to implement swap function

using + -

using temp variable

using xor (IMP)

l2

vector

~~declaration~~

~~initialization~~

~~arr.size();~~

~~arr.capacity();~~

~~arr.push\_back(value);~~

~~arr.pop\_back();~~

~~sizeof(arr);~~

~~find unique element~~

~~find union of 2 arrays having no duplicate~~

~~find intersection of 2 arrays~~

~~for each loop~~

~~for(auto i:arr)~~

~~print all pairs of a vector~~

~~pairSum print all pairs with a given sum and array~~

~~tripletSum print all triplets with a given sum and arrays~~

~~quadSum print all det of 4 elements with a given sum and array~~

~~sort 0s and 1s dutch national flag~~

HOMEWORK

~~find union of 2 arrays~~

count 0s and 1s and 2s

left rotate an array by 1 element

majority element in an array

buy and sell stock level 1

dutch national flag

https://www.geeksforgeeks.org/3-way-quicksort-dutch-national-flag/

l3

~~2D arrays~~

~~declaration~~

~~how it store in memory~~

~~mapping of 2D array in memory~~

~~initialization~~

~~row-wise access~~

~~col-wise access~~

~~mapping formula~~

~~2D arrays and functions~~

~~taking row wise input~~

~~taking col wise input~~

~~print row sum~~

~~print col sum~~

~~linear search in a matrix~~

~~maximum and minimum elements in a matrix~~

~~transpose of any rectangular matrix~~

~~transpose of a square matrix~~

2D vector

~~declaration~~

~~how it store in memory~~

~~inserion~~

~~number of rows and columns~~

~~row-wise access in 2D vector if number of elements in 1D vector are different~~

~~initialization~~

~~vector<vector<int>> arr (rows, vector<int>(cols,value));~~

~~vector<vector<int>> arr (3, vector<int>(5,101));~~

HOMEWORK

sort 0s, 1s and 2s

move all -ve numbers to one side of an array

find duplicate in an array

find missing element in an array

find first repeating element in an array

find common elements in 3 sorted arrays

intersection of 3 sorted arrays

factorial of large number

rotate by 90 deg

spiral print

wave print

SEARCHING-SORTING - Week 4

l1

~~binary search~~

~~binary search in STL~~

~~find first and last occurence of an element in an array~~

first and last occurence in sorted array using STL

total number of occurences in sorted array

~~find peak element in a mountain array (IMP)~~

HOMEWORK

issue in mid = s/2 + e/2;

if both s and e are odd, mid gives wrong index

~~find last occurence of an element in an array~~

iterator and auto keyword

https://www.geeksforgeeks.org/iterators-c-stl/

https://www.geeksforgeeks.org/type-inference-in-c-auto-and-decltype/

find missing element

~~find pivot in sorted rotated array~~

~~search in rotated sorted array~~

~~integer sqrt of a number~~

~~double sqrt of a number~~

l2

~~binary search in matrix~~

HOMEWORK

~~search in a nearly sorted array in log time~~

~~division of 2 numbers using binary search~~

~~find odd occuring element using BS~~

l3

HOMEWORK

find division upto given precision

find pairs with diff 'k' in an array

find k closest elements to a given value in a sorted array

exponential search

unbounded BS

adv BS questions

book allocation

painter partition

aggressive cows

roti / paratha spoj

eko spoj

in pivot ques, make condition using mid and end

sqrt with precision using binary search in precision part too

l1 Strings

~~char and taking input~~

~~length of char array~~

~~reverse a char array~~

~~replace all spaces with @~~

~~pallindrome~~

~~convert to uppercase~~

~~string and taking input~~

~~difference between string and array~~

~~inbuilt functions of strings~~

~~implement compare 2 strings~~

HOMEWORK

NULL char is '0' or '\0'

getline

https://www.geeksforgeeks.org/getline-string-c/

strcmp

how to insert chars in between char array using insert function?

convert to lowercase

l2

~~Remove All Adjacent Duplicates In String~~

https://leetcode.com/problems/remove-all-adjacent-duplicates-in-string/

~~Remove All Occurrences of a Substring~~

https://leetcode.com/problems/remove-all-occurrences-of-a-substring/

~~Valid Palindrome II~~

https://leetcode.com/problems/valid-palindrome-ii/

~~MinSimum Time Difference~~

https://leetcode.com/problems/minimum-time-difference/

~~Palindromic Substrings~~

https://leetcode.com/problems/palindromic-substrings/

HOMEWORK

implement s.find, s.erase

print all substrings of a string

242 valid anagram

917 reverse only letters

14 longest common prefix

345 reverse vowels of string

isomorphic strings

reorganise strings

group anagrams

longest palindromic substrings

find index of first occ in a string

string to integer

string compression

integer to roman

zigzag conversion

QUESTIONS WITHOUT SOLUTIONS

179 largest number

791 custom sort string

953 verify alien dictionary

524 longest word in dictionary through deleting

BASIC MATHS

count number of prime numbers

https://leetcode.com/problems/count-primes/

sieve of eratosthenes theorem / sieve theorem

gcd / hcf and lcm

euclid's algo

exponentiation

modular exponentiation for large numbers

https://practice.geeksforgeeks.org/problems/modular-exponentiation-for-large-numbers5537/1

HOMEWORK

segmented sieve

https://www.geeksforgeeks.org/segmented-sieve/

advanced topics (cp scope)

pigeon hole

catalan number(bst)

inclusion - exclusion principle

chinese reminder theorem

lucas' theorem

fermat's theorem

probability concepts

RECURSION

L1

factorial of given number

print reverse counting

print counting from 1 to n

fibonacci number

HOMEWORK

factorial

counting

reverse counting

power of 2

fibonacci series

climb stairs Leetcode

print digits of a number

find maximum and minimum number using recursion

find element, its count and index in an array

climb stairs

https://leetcode.com/problems/climbing-stairs

print array

print reverse array

maximum and minimum number from an array

search in string

find all occurence of key

number to digits

integer literal with a leading 0 (IMP)]

L2

Do revision

L3

1) Revise the questions done in class today

--> Binary Search

--> Subsequences of String

--> Array is sorted or not

2) Try phone keypad problem

L4

1) Code the alternative solution of minimum coin change problem on your own.

2) House Robbery - 1 problem base on maximum sum of non-adjacent elements.

Backtracking

L1

Dry run rat and maze problem on atleast 5 test cases.

L2

Dry run N-queens problem on atleast 5 test cases.

L3

1) Dry run atleast 5 test cases on questions - Generate Parantheses and Letter combinations of Phone Number

2)

--> Number of squareful arrays

--> Word Break - 1

--> Letter tile combination

--> Sum of all subset XOR

L4

1. Repeat sudoku solver question on some test cases to get better understanding. (Repeat the video)

Linked List

L1

1. Write a destructor to delete a node in Linked List.

L2

1) Do the insertion thing at specified position with just single pointer. (Order of steps do matter)

2) Implement all operations of circular linked list. (Both singly and doubly)

L3

1) Code middle of the linked list using length approach.

2) Linked List is circular or not.

-> Using Single Pointer

-> Using slow and fast pointer

-> Using map

3) Find and count function in map.

4) Should we write slow!= NULL in the LOOP where fast!=NULL ??

5) Can we apply slow and fast to the find whether circular linked list or not?

6) Find a case where prev = fast thing will fail while we remove the loop in linked list.

L4

1) Remove duplicates from unsorted linked list.

-> Nested loops

-> Map

-> Sort and then apply logic of remove duplicates in sorted linked list

2) Add 1 to the Linked List

Stacks

L1

1) Read the documentation of stack on cpp reference : https://en.cppreference.com/w/cpp/container/stack

2) Try implementing the stack with the help of Linked List

L2

1. Code of remove redundant brackets.

L3

1. How to insert elements in the pair using curly brackets?

L4

1) Revise the concepts discussed in the class.