# TCP Assignment 2

# Topic: Basic Programming With intro to Containers

## Resources

**FUNCTIONS**
- https://www.programiz.com/cpp-programming/function
- https://cplusplus.com/doc/tutorial/functions/

**ARRAYS, MATRIX AND STRINGS**
- https://www.hackerearth.com/practice/data-structures/arrays/1-d/tutorial/
- https://www.geeksforgeeks.org/string-data-structure/

**STL VECTOR & PAIR**
- Vector - https://www.programiz.com/cpp-programming/vectors
- Pairs - https://www.scaler.com/topics/cpp/pair-in-cpp/
- STL Playlist -
  https://www.youtube.com/playlist?list=PLauivoElc3gh3RCiQA82MDI-gJfXQQVnn
  ( Video No's 1 , 2 , 3 )

**TIME & SPACE COMPLEXITY**
- Article
  https://www.codingninjas.com/codestudio/library/time-and-space-complexity-in-algorithms
- Video - https://www.youtube.com/playlist?list=PLDN4rrl48XKpZkf03iYFl-O29szjTrs_O
  ( Video No's 6 to 13 )

**SEARCHING**
- Linear Search - https://www.geeksforgeeks.org/linear-search/
  ( Video - https://youtu.be/C46QfTjVCNU )
- Binary Search - https://www.geeksforgeeks.org/binary-search/
  ( Video - https://youtu.be/C2apEw9pgtw )

**MATHEMATICS**
- Prime Numbers & Prime Factorization
  https://www.geeksforgeeks.org/program-to-print-first-n-prime-numbers/
  ( Video - https://youtu.be/j8Y1fDgFnsI )
- Sieve Of Erathronese ( For Prime Numbers ) -
  ( Video - https://www.youtube.com/watch?v=T8PaMnb0GPo&ab_channel=Luv )
- Bitwise Operators - https://www.geeksforgeeks.org/bitwise-operators-in-c-cpp/
- GCD - https://www.geeksforgeeks.org/program-to-find-gcd-or-hcf-of-two-numbers/
  ( Neglect top down memoization for now )
  ( Also look at STL function **__gcd( a , b )** to find gcd )

**STL & FUNCTIONS ( V.IMP )**
- STL Playlist - https://www.youtube.com/playlist?list=PLauivoElc3gh3RCiQA82MDI-gJfXQQVnn ( Video No's 4 to 8 , 14, 15, 16 ( Optional for now - 10 ) )
- Sort Function , upper_bound ,lower_bound , __gcd etc..


# Practice problems

## Arrays
- https://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/
- https://practice.geeksforgeeks.org/problems/union-of-two-arrays3538/1
- https://practice.geeksforgeeks.org/problems/move-all-negative-elements-to-end1813/1
- https://practice.geeksforgeeks.org/problems/equilibrium-point-1587115620/1?page=1&category[]=Arrays&category[]=Strings&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/reverse-array-in-groups0255/1?page=2&category[]=Arrays&category[]=Strings&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/rotate-array-by-n-elements-1587115621/1?page=2&category[]=Arrays&category[]=Strings&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/majority-element-1587115620/1


## Matrix
- https://practice.geeksforgeeks.org/problems/spirally-traversing-a-matrix-1587115621/1?page=2&category[]=Arrays&category[]=Strings&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/search-in-a-matrix-1587115621/1
- https://practice.geeksforgeeks.org/problems/transpose-of-matrix-1587115621/1
- https://practice.geeksforgeeks.org/problems/rotate-by-90-degree-1587115621/1
- https://practice.geeksforgeeks.org/problems/row-with-max-1s0023/1
- https://practice.geeksforgeeks.org/problems/boolean-matrix-problem-1587115620/1

## Strings
- https://practice.geeksforgeeks.org/problems/reverse-words-in-a-given-string5459/1?page=2&category[]=Arrays&category[]=Strings&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/anagram-1587115620/1?page=2&category[]=Arrays&category[]=Strings&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/uncommon-characters4932/1?page=1&category[]=Strings&curated[]=1&sortBy=submissions
- https://practice.geeksforgeeks.org/problems/remove-duplicates3034/1?page=1&category[]=Strings&curated[]=1&sortBy=submissions

## Time and space complexity
https://www.geeksforgeeks.org/miscellaneous-problems-of-time-complexity/

**Mathematics**

- [https://practice.geeksforgeeks.org/problems/count-digits5716/1](https://practice.geeksforgeeks.org/problems/count-digits5716/1)
- [https://leetcode.com/problems/factorial-trailing-zeroes/](https://leetcode.com/problems/factorial-trailing-zeroes/)
- [https://practice.geeksforgeeks.org/problems/lcm-and-gcd4516/1](https://practice.geeksforgeeks.org/problems/lcm-and-gcd4516/1)
- [https://practice.geeksforgeeks.org/problems/all-divisors-of-a-number/1](https://practice.geeksforgeeks.org/problems/all-divisors-of-a-number/1)
- [https://practice.geeksforgeeks.org/problems/prime-factors5052/1](https://practice.geeksforgeeks.org/problems/prime-factors5052/1)
- [https://practice.geeksforgeeks.org/problems/power-of-numbers-1587115620/1](https://practice.geeksforgeeks.org/problems/power-of-numbers-1587115620/1)
- [https://practice.geeksforgeeks.org/problems/sieve-of-eratosthenes5242/1](https://practice.geeksforgeeks.org/problems/sieve-of-eratosthenes5242/1)

**Optional**

- [https://practice.geeksforgeeks.org/problems/square-root/1](https://practice.geeksforgeeks.org/problems/square-root/1)
- [https://practice.geeksforgeeks.org/problems/peak-element/1](https://practice.geeksforgeeks.org/problems/peak-element/1)
- [https://practice.geeksforgeeks.org/problems/minimum-element-in-a-sorted-and-rotated-array3611/1](https://practice.geeksforgeeks.org/problems/minimum-element-in-a-sorted-and-rotated-array3611/1)