Class - 1: Introduction to Computer Programming and Competitive Programming and My Life story

- Introduction to the course
- Introduction to Computer Programming
- Introduction to Competitive Programming
- Introduction to Programming Contest
- My Life story and motivation for doing competitive programming

Class - 2: Introduction to online judges and Guideline for practice

- Introduction to Online Judges
- Guideline for Practice

Class - 3: Introduction to Codeforces Programming Contest (Div-4, Div-3, Div-2, Edu, Div-1)

- Introduction to Codeforces Contest
- Div-4, Div-3, Div-2, Edu, Div-1
- ICPC Style Ranklist, Codeforces Score RankList
- What is codeforces rating? and how codeforces contests affect the rating.

Class - 4: Introduction to Different Famous Online and Onsite Contests

- Introduction to Onsite contest (Divisional, National)
- ICPC, NCPC, IUPC
- Introduction to Online Contests
- Google Codejam, Google Kick Start, Facebook hacker cup, Snack Down
- Some Important links

Class - 5: Write your first "Hello World" Program and solve your first Online Judge Problem

- Write Your First Program “Hello World”
- Solve Problem from BeeCrowd
- Solve the Easiest Problem of ACM ICPC Dhaka Regional Onsite Contest -2020
- Variables and Data type (int, long long, char)

Practice Problems (Assignment) :

- https://www.beecrowd.com.br/judge/en/problems/view/1000
- https://algo.codemarshal.org/contests/diu_takeoff_fall_19/problems/A
- https://algo.codemarshal.org/contests/icpc-dhaka-20/problems/K
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/welcome-to-cps-academy

Class - 6: Double, Float, bool, Taking Input (scanf), Operators (+, -, *)

- float and double data types
- Taking input (int, long long, double, float, char)
- Operators (+, -, *)

Practice Problems (Assignment) :

- https://acm.timus.ru/problem.aspx?space=1&num=1000
- https://www.beecrowd.com.br/judge/en/problems/view/1004
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_1_B
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-6-a-task-1-a-addition-subtraction-and-multiplication
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_1_C
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-7-a-task-1-a-solve-the-equation-i
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-7-a-task-2-a-solve-the-equation-ii

Class - 7: Fraction Operations and Modulus

- Fraction Calculation
- Modulus operation
- Cyclic Pattern in Modulus

Practice Problems (Assignment) :

- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-6-a-task-1-a-addition-subtraction-and-multiplication\
- https://www.beecrowd.com.br/judge/en/problems/view/1006
- https://atcoder.jp/contests/abc235/tasks/abc235_a?lang=en
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_4_B
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_4_A
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_1_D

Class - 8 : +=, -=, *=, /=, %=, increment(++), decreament(--) and bitwise operators OR(|), AND(&), XOR(^)

- More operators (+=, -=, *=, /=, %=)
- Increment, decrement
- Pre increment / decreament
- Post increment / decreament
- Bitwise operators OR(|), AND(&), XOR(^)
- Patterns in XOR
- An interesting google interview question with XOR

Practice Problems (Assignment) :

- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-8-aa-task-1-aa-calculate-the-or
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-8-aa-task-1-aa-calculate-the-and
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-8-aa-task-1-aa-calculate-the-xor

Class - 9: if-else Condition

- Condition and comparison
- Get Grades using marks
- Get match joining validity using weight

Practice Problems (Assignment):

- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-10-aa-task-1-aa-rock-paper-scissors
- https://atcoder.jp/contests/abc148/tasks/abc148_a?lang=en
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_2_C
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_2_B
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_2_A

Class - 10: if-else Condition, How to think of the scenario not the test case

- Think scenario, not a test case

Practice Problems (Assignment) :

- https://codeforces.com/problemset/problem/4/A
- https://atcoder.jp/contests/abc149/tasks/abc149_b

Class - 11: Loops

- Loops
- While loop
- For loop
- Do-while loop
- Infinite loop
- Relationship of variables between parent block and child block

Practice Problems (Assignment) :

- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_3_A
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_3_B
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_3_C
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_3_D
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_4_C
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_4_D
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_5_A
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_5_B
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_5_C

Class - 12: Practice problems on Loops

- How to handle text cases
- Calculate int square root of n
- Calculate the number of divisors of a number n
- Fast discussed some loop problems from vjudge assignment contest

Practice Problems (Assignment) :

- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-13-aa-task-1-aa-is-perfect-square-i
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-13-aa-task-2-aa-count-number-of-divisors-i
- https://lightoj.com/problem/greetings-from-lightoj
- https://lightoj.com/problem/opposite-task

Class - 13: Practice problems on Loops

- More practice problems on loops

Practice Problems (Assignment) :

- https://leetcode.com/problems/three-divisors/
- https://codeforces.com/contest/1560/problem/A
- https://atcoder.jp/contests/abc151/tasks/abc151_b

Class - 14: Introduction to Arrays

- Introduction to Arrays
- Count the frequency of elements in an array

Practice Problems (Assignment) :

- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-16-aa-task-1-aa-count-the-frequency-i
- https://atcoder.jp/contests/abc235/tasks/abc235_b

Class - 15: Practice problems of Arrays

- Practice problems on arrays

Practice Problems (Assignment) :

- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-16-aa-task-1-aa-count-the-frequency-i
- https://atcoder.jp/contests/abc236/tasks/abc236_b
- https://www.hackerrank.com/contests/cpbc-assignments-batch-1/challenges/class-17-aa-task-1-aa-respectfully-giving-away
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_6_A
- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_6_B
- https://cses.fi/problemset/task/1083

Class - 16: Introduction multi-dimension array and char array (String)

- Introduction to strings
- reverse string
- check string is palindrome or not
- Multi dimension array
- 2D, 3D array
- Grid (input and output)

Practice Problems (Assignment) :

- https://atcoder.jp/contests/abc233/tasks/abc233_b
- https://codeforces.com/problemset/problem/469/A

Class - 17: Practice Problems for 2D Array and string

- Convert char to digit
- Convert digit to char

- Indexing of char

Practice Problems (Assignment) :

- https://judge.u-aizu.ac.jp/onlinejudge/description.jsp?id=ITP1_6_D

Class - 18: Introduction to Bruteforce

- Brute force

Practice Problems (Assignment) :

- https://codeforces.com/problemset/problem/304/A

Class - 19: Introduction to Constructive and Practice problem of Bruteforce

- Practice Problems of Brute force
- Introduction to Constructive Algorithm

Practice Problems (Assignment) :

- https://codeforces.com/problemset/problem/199/A
- https://cses.fi/problemset/task/1070
- https://atcoder.jp/contests/abc234/tasks/abc234_b

Class - 20: Introduction to Greedy

- Introduction to Greedy
- Solving the knapsack problem with Greedy
- Using the 0-1knapsack Problem proved that we can’t solve it using Greedy

Practice Problems (Assignment) :

- https://codeforces.com/contest/514/problem/A

Class - 21: Practice Problem to Greedy

- Practice problems on greedy

Practice Problems (Assignment) :

- https://codeforces.com/contest/1207/problem/A
- https://cses.fi/problemset/task/1094

Class - 22: Time and Memory complexity analysis

- Time complexity
- Big-O notation
- O(1) Constant time complexity
- O(n) Linear time complexity
- O(n^2)
- O(n^3)
- O(log(n))
- Polynomial time complexity
- Exponential time complexity

Class - 23: Introduction to Function

- Introduction to Function
- Implement some important functions
- swap, min, max
- call by value
- call by reference

Class - 24: Starting Program to C++

- Implement pow() function
- Implement reverse function
- Introduction to C++
- I/O (cin, cout)
- #define
- typedef
- making cin cout faster
- set precision
- built-in functions (swap(), max(), min(), sqrt(), cbrt(), ceil(), floor()

Class - 25: Builtin functions of C/C++

- Reverse
- Sort function
- Increasing order / non-decreasing order
- Decreasing order / non-increasing order
- isupper(), islower(), toupper(), tolower()
- strcat(), strcmp(), strcpy(), strlen()
- __gcd(), lcm()