

1. Given a number n, the task is to generate n bit Gray codes (generate bit patterns from 0 to 2^n-1 such that successive patterns differ by one bit)

Examples:

Input : 2

Output : 0 1 3 2

Explanation :

00 - 0

01 - 1

11 - 3

10 - 2

Input : 3

Output : 0 1 3 2 6 7 5 4

2. Given an array arr[] consisting of N positive integers, the task is to generate all distinct subsequences of the array.

Examples:

Input: arr[] = {1, 2, 2}

Output: {} {1} {1, 2} {1, 2, 2} {2} {2, 2}

Explanation:

The total subsequences of the given array are {}, {1}, {2}, {2}, {1, 2}, {1, 2}, {2, 2}, {1, 2, 2}. Since {2} and {1, 2} are repeated twice, print all the remaining subsequences of the array.

Input: arr[] = {1, 2, 3, 3}

Output: {} {1} {1, 2} {1, 2, 3} {1, 2, 3, 3} {1, 3} {1, 3, 3} {2} {2, 3} {2, 3, 3} {3} {3, 3}

3. Given the Binary code of a number as a decimal number, we need to convert this into its equivalent Gray Code. Assume that the binary number is in the range of integers. For the larger value, we can take a binary number as string.

In gray code, only one bit is changed in 2 consecutive numbers.

Examples:

Input: 1001

Output: 1101

Explanation: 1001 -> 1101 -> 1101 -> 1101

4. Given a string S, the task is to write a program to print all permutations of a given string.

A permutation also called an “arrangement number” or “order,” is a rearrangement of the elements of an ordered list S into a one-to-one correspondence with S itself. A string of length N has $N!$ permutations.

Examples:

Input: S = "ABC"

Output: "ABC", "ACB", "BAC", "BCA", "CBA", "CAB"

5. The problem is to print all the possible paths from top left to bottom right of a $m \times n$ matrix with the constraints that from each cell you can either move only to right or down.

Examples :

Input : 1 2 3

4 5 6

Output : 1 4 5 6

1 2 5 6

1 2 3 6

Input : 1 2

3 4

Output : 1 2 4

1 3 4

6. Given a set S, generate all distinct subsets of it, i.e., find distinct power set of set S. A power set of any set S is the set of all subsets of S, including the empty set and S itself.

For example, if S is set {x, y, x}, then the subsets of S are:

{ } (also known as the empty set or the null set).

{x}

{y}

{x}

{x, y}

{x, x}

{y, x}

{x, y, x}

Therefore, distinct subsets in the power set of S are: { { }, {x}, {y}, {x, y}, {x, x}, {x, y, x} }.

7. The cost of a stock on each day is given in an array. Find the maximum profit that you can make by buying and selling on those days. If the given array of prices is sorted in decreasing order, then profit cannot be earned at all.

Examples:

Input: arr[] = {100, 180, 260, 310, 40, 535, 695}

Output: 865

Explanation: Buy the stock on day 0 and sell it on day 3 $\Rightarrow 310 - 100 = 210$

Buy the stock on day 4 and sell it on day 6 $\Rightarrow 695 - 40 = 655$

Maximum Profit = $210 + 655 = 865$

Input: arr[] = {4, 2, 2, 2, 4}

Output: 2

Explanation: Buy the stock on day 1 and sell it on day 4 $\Rightarrow 4 - 2 = 2$

Maximum Profit = 2
