Data Structures Lab (CSC204) **Session: Monsoon 2021-22**
III BTech (CSE) **Date: 24.08.2021**

Assignment-2 (Array)

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1. Given an array of integers named, $numbers$ of size N and a target integer T. Write a program to print the indices of the two numbers such that they add up to target T. You may assume that each input would have exactly one solution, and you cannot use the same element twice. If no such pair exits then print -1.

   Sample Input:
   $numbers = [1, 8, 11, 14]$
   $T = 22$

   Sample Output:
   1 3

2. You are given with the starting and ending time of n classes. These classes may or may not overlap with each other. Write a program to determine whether it is possible to attend all the classes without any overlap. Give the output as $True$ or $False$. All the times are given in 24-hour format.

   Sample Input:
   $n = 5$
   $Start\ and\ end\ time\ of\ class\ 1: 1\ 3$
   $Start\ and\ end\ time\ of\ class\ 2: 8\ 10$
   $Start\ and\ end\ time\ of\ class\ 3: 7\ 8$
   $Start\ and\ end\ time\ of\ class\ 8: 11\ 15$
   $Start\ and\ end\ time\ of\ class\ 5: 4\ 6$

   Sample Output:
   $True$

3. A group of N $(N \geq 1)$ students are standing linearly, and their roll numbers are assigned as 1 to N. They are playing a game in which their positions are shifted by K steps in each round in a circular manner, i.e., the last student shifts to the first and so on. We also consider that there are M $(1 \leq M < N)$ chairs initially. At each round the first M students will be able to sit on the M chairs, and after each round the number of chairs will be decreased by 1 $(\mathrm{M} = \mathrm{M} - 1, \text{for next rounds})$. The student who is able to sit on the last chair will be the winner. Write a program to find out the roll number of the winner student. Your program must not use any extra array other than that needed to store the group of students.

   Sample Input:
   $N = 4$
   $M = 2$
   $K = 3$
   $Roll\ Nos. = 1\ 2\ 3\ 4$

   Sample Output:
   $Roll\ Nos. = 3$

4. You are interested in buying and selling stocks. You are maintaining a list for all the stock prices. You are given some queries (q) according to which you buy and sell the stocks in your holding. When the query is for buying the stock, add its price to the list and print "Buying Successful". When the query is for selling, delete the first buying stock from your list whose price lies in the range of prices (X, Y), set by the buyers of your selling stock. Write a program to print either "Buying Successful" or the stock price you are selling. If there is no stock available in the given range to sell then just print -1.

Queries are of the following formats:

- $B\ X$: B means to buy and X is the price of stock.
- $S\ X\ Y$: S means to sell in the range of (X, Y).

Sample Input:	**Sample Output:**
$q = 6$	
$S\ 3\ 8$	-1
$B\ 4$	$Buying\ Successful$
$B\ 10$	$Buying\ Successful$
$B\ 6$	$Buying\ Successful$
$S\ 3\ 7$	4
$S\ 15\ 20$	-1

- After processing all the above queries, your list should contain the price of remaining stocks only, i. e., 10 and 6 in order as per the above example.