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Problem 1: Parity of two Integers

For two given integers, return whether two integers have the same parity.
parity – if both values are even or both odd, then they have the same parity.

Function Definition:
boolean parity(int x1, int x2){}

Test Cases:
Input: 1, 1 Output: true
Input: 1, 2 Output: false
Input: 2, 2 Output: true

Problem 2: Circle of Numbers

Link to Problem: https://app.codesignal.com/arcade/intro/level-7/vExYvcGnFsEYSt8nQ

Consider integer numbers from 0 to n - 1 written down along the circle in such a way that the distance between any two neighboring numbers is equal (note that 0 and n - 1 are neighboring, too).

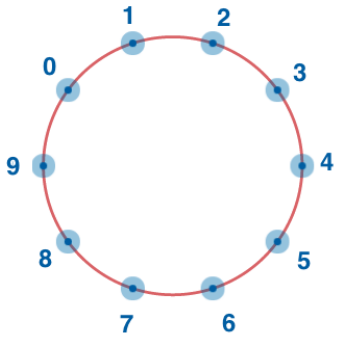
Given n and firstNumber, find the number which is written in the radially opposite position to firstNumber.

Function Definition:
int circleOfNumbers(int n, int firstNumber) {}

Example

For n = 10 and firstNumber = 2, the output should be

circleOfNumbers(n, firstNumber) = 7.



Input/Output
[execution time limit] 3 seconds (java)
[input] integer n

A positive even integer.

Guaranteed constraints:
$4 \leq n \leq 20$.

[input] integer firstNumber

Guaranteed constraints:
$0 \leq firstNumber \leq n - 1$.

Test Cases:
Input: 10, 2 Output: 7
Input: 10, 7 Output: 2
Input: 4, 1 Output: 3
Input: 6, 3 Output: 0

Problem 3: Adjacent Maximal Adjacent Difference

Link to Problem: https://app.codesignal.com/arcade/intro/level-5/EEJxjQ7oo7C5wAGjE

Given an array of integers, find the maximal absolute difference between any two of its adjacent elements.

Function Definition:
int arrayMaximalAdjacentDifference(int[] inputArray) {}

Example
For inputArray = [2, 4, 1, 0], the output should be
arrayMaximalAdjacentDifference(inputArray) = 3.

Input/Output

[execution time limit] 3 seconds (java)

[input] array.integer inputArray

Guaranteed constraints:
$3 \leq$ inputArray.length ≤ 10,
$-15 \leq$ inputArray[i] ≤ 15.

[output] integer
The maximal absolute difference.

Test Cases:

Input: [2, 4, 1, 0]	Output: 3
Input: [1, 1, 1, 1]	Output: 0
Input: [-1, 4, 10, 3, -2]	Output: 7
Input: [10, 11, 13]	Output: 2

Problem 4: Check Palindrome

Link to Problem: https://app.codesignal.com/arcade/intro/level-1/s5PbmwxfECC52PWyQ
Given the string, check if it is a palindrome.

Function Definition:
boolean checkPalindrome(String inputString){}

Example

For inputString = "aabaa", the output should be

checkPalindrome(inputString) = true;

For inputString = "abac", the output should be

checkPalindrome(inputString) = false;

For inputString = "a", the output should be

checkPalindrome(inputString) = true.

Input/Output

[execution time limit] 3 seconds (java)

[input] string inputString

A non-empty string consisting of lowercase characters.

Guaranteed constraints:

$1 \leq$ inputString.length ≤ 105.

[output] boolean

true if inputString is a palindrome, false otherwise.

Test Cases:
Input: “aabaa” Output: true
Input: “cat” Output: false
Input: “a” Output: true

Bonus Problem: Parity of 1s

(Derived from parity from Elements of Programming Interviews – Aziz, Lee, Prakash)

The parity of an integer in its binary form is “even” if the number of 1s in the integer is even. Otherwise, if the number of 1s in the integer is odd, the parity is “odd”. An integer in its binary form can only have a parity of even or odd. Find the parity of an integer and print a corresponding even or odd.

Function Definiton: void Parity(unsigned long x){}

Test Cases

Input: 37 (Corresponding Decimal Value: 100101) Output: “odd”
Input: 0 Output: “even”
Input: 8 (Corresponding Decimal Value: 1000 Output: “odd”