**Lab Practical #14:**

Implementation of parity bit check Using C/Java language with example.

**Practical Assignment #14:**

1. **C/Java Program: Implementation of parity bit check Using C/Java language.**

import java.util.Scanner;

public class ParityBitCheck {

public static String addParityBit(String dataBits, String parityType) {

int countOnes = 0;

for (char bit : dataBits.toCharArray()) {

if (bit == '1') countOnes++;

}

char parityBit;

if (parityType.equalsIgnoreCase("even")) {

parityBit = (countOnes % 2 == 0) ? '0' : '1';

} else {

parityBit = (countOnes % 2 == 0) ? '1' : '0';

}

return dataBits + parityBit;

}

public static boolean checkParity(String data, String parityType) {

char parityBit = data.charAt(data.length() - 1);

String dataBits = data.substring(0, data.length() - 1);

int countOnes = 0;

for (char bit : dataBits.toCharArray()) {

if (bit == '1') countOnes++;

}

boolean isValid;

if (parityType.equalsIgnoreCase("even")) {

isValid = ((countOnes % 2 == 0) && parityBit == '0') ||

((countOnes % 2 == 1) && parityBit == '1');

} else {

isValid = ((countOnes % 2 == 0) && parityBit == '1') ||

((countOnes % 2 == 1) && parityBit == '0');

}

return isValid;

}

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter binary data (without parity bit): ");

String dataBits = scanner.nextLine();

System.out.print("Enter parity type (even/odd): ");

String parityType = scanner.nextLine();

String dataWithParity = addParityBit(dataBits, parityType);

System.out.println("Data with " + parityType + " parity bit: " + dataWithParity);

if (checkParity(dataWithParity, parityType)) {

System.out.println("Parity check PASSED.");

} else {

System.out.println("Parity check FAILED.");

}

scanner.close();

}

}

**Input:**

Enter binary data (without parity bit): 1011

Enter parity type (even/odd): even

**Output:**

Data with even parity bit: 10111

Parity check PASSED.