**Assignment-7**

**Date: 16.03.2023**

## **//Cyclic Redundency Check (CRC) for error detection:**

**//Code:**

import java.util.\*;

class Main {

public static void main(String args[]) {

Scanner scan = new Scanner(System.in);

int n;

System.out.println("Enter the size of the data:");

n = scan.nextInt();

int data[] = new int[n];

System.out.println("Enter the data, bit by bit:");

for(int i=0 ; i < n ; i++) {

System.out.println("Enter bit number " + (n-i) + ":");

data[i] = scan.nextInt();

}

System.out.println("Enter the size of the divisor:");

n = scan.nextInt();

int divisor[] = new int[n];

System.out.println("Enter the divisor, bit by bit:");

for(int i=0 ; i < n ; i++) {

System.out.println("Enter bit number " + (n-i) + ":");

divisor[i] = scan.nextInt();

}

int remainder[] = divide(data, divisor);

for(int i=0 ; i < remainder.length-1 ; i++) {

System.out.print(remainder[i]);

}

System.out.println("\nThe CRC code generated is:");

for(int i=0 ; i < data.length ; i++) {

System.out.print(data[i]);

}

for(int i=0 ; i < remainder.length-1 ; i++) {

System.out.print(remainder[i]);

}

System.out.println();

int sent\_data[] = new int[data.length + remainder.length - 1];

System.out.println("Enter the data to be sent:");

for(int i=0 ; i < sent\_data.length ; i++) {

System.out.println("Enter bit number " + (sent\_data.length-i)

+ ":");

sent\_data[i] = scan.nextInt();

}

receive(sent\_data, divisor);

}

static int[] divide(int old\_data[], int divisor[]) {

int remainder[] , i;

int data[] = new int[old\_data.length + divisor.length];

System.arraycopy(old\_data, 0, data, 0, old\_data.length);

remainder = new int[divisor.length];

System.arraycopy(data, 0, remainder, 0, divisor.length);

for(i=0 ; i < old\_data.length ; i++) {

System.out.println((i+1) + ".) First data bit is : "

+ remainder[0]);

System.out.print("Remainder : ");

if(remainder[0] == 1) {

for(int j=1 ; j < divisor.length ; j++) {

remainder[j-1] = exor(remainder[j], divisor[j]);

System.out.print(remainder[j-1]);

}

}

else {

for(int j=1 ; j < divisor.length ; j++) {

remainder[j-1] = exor(remainder[j], 0);

System.out.print(remainder[j-1]);

}

}

remainder[divisor.length-1] = data[i+divisor.length];

System.out.println(remainder[divisor.length-1]);

}

return remainder;

}

static int exor(int a, int b) {

if(a == b) {

return 0;

}

return 1;

}

static void receive(int data[], int divisor[]) {

int remainder[] = divide(data, divisor);

for(int i=0 ; i < remainder.length ; i++) {

if(remainder[i] != 0) {

System.out.println("There is an error in received data...");

return;

}

}

System.out.println("Data was received without any error.");

}

}

**//Output:**





