import java.io.BufferedReader;

import java.io.IOException;

import java.io.InputStreamReader;

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public class CRC {

String frame;

static CRC obj;

public CRC(){

frame = "";

}

public CRC(String frame){

this.frame = frame;

}

public static void main(String[] args)throws Exception{

System.out.println("Computing cyclic redundancy");

obj = new CRC();

obj.sender();

obj.reciever();

}

public void sender()throws IOException{

BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

System.out.print("Enter data of the Frame : ");

String frameData = br.readLine();

System.out.print("Enter the generating function : ");

String generatingFunction = br.readLine();

String frameCopy = frameData;

frameData += "000";

String data;

String rem = "";

//to calculate remainder using X-OR

for(; frameData.length()>3 ;){

data = frameData.substring(0,4);

rem = xor(data , generatingFunction);

frameData = rem + frameData.substring(4);

}

System.out.println("Sender frame data = " + frameCopy + "" + rem);

}

public String xor(String data , String gx){

char c[] = data.toCharArray();

char g[] = gx.toCharArray();

String rem = "";

Character r[] = {'0','0','0','0'};

for(int i = 0 ; i < 4 ; i++){

if(c[i]==g[i])

r[i]='0';

else

r[i]='1';

rem += r[i].toString();

}

if(rem.indexOf("1")==-1)

rem = "";

else

rem = rem.substring(rem.indexOf("1"));

if(rem.length()!=3){

int i = rem.length();

if(i == -1)

i++;

for( ; i < 3 ; i++)

rem = "0" + rem;

}

return rem;

}

public void reciever()throws IOException{

BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

System.out.print("Enter recieved string is : ");

String recievedData = br.readLine();

System.out.print("Enter generating function : ");

String generatingFunction = br.readLine();

String data = "";

String rem = "";

for(; recievedData.length()>3 ;){

data = recievedData.substring(0,4);

rem = xor(data , generatingFunction);

recievedData = rem + recievedData.substring(4);

}

if(rem.equals("000"))

System.out.println("Data with no error");

else

System.out.println("Data with error");

}

}

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Output 1:

Computing cyclic redundancy

Enter data of the Frame : 11001111101

Enter the generating function : 1101

Sender frame data = 11001111101010

Enter recieved string is : 11001111101010

Enter generating function : 1101

Data with no error

Output 2:

Computing cyclic redundancy

Enter data of the Frame : 11001111101

Enter the generating function : 1101

Sender frame data = 11001111101010

Enter recieved string is : 11001111101011

Enter generating function : 1101

Data with error

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