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import java.util.*;
public class Progl {
    public static int t[]=new int[100], cs[]=new int[100],g[]={1,0,1,1};
    public static int a,e,k,c,N=g.length;
    public static void xor()
    {
        for(c=1;c<N;c++)
            cs[c]=((cs[c]==g[c])?0:1);
    }
    public static void crc()
    {
        for(e=0;e<N;e++)
            cs[e]=t[e];
        do{
            if(cs[0]==1)
                xor();
            for(c=0;c<N-1;c++)
                cs[c]=cs[c+1];
            cs[c]=t[e++];
        }
        while(e<=a+N-1);
    }
    public static void main(String args[])
    {
        int flag=0;
        Scanner scan=new Scanner(System.in);
        System.out.println("Enter the lenght of Data word");
        int dw_len=scan.nextInt();
        System.out.println("Enter the dataword");
        for(e=0;e<dw_len;e++)
            t[e]=scan.nextInt();
        System.out.println("genreretor polynomial is");
        for(e=0;e<g.length;e++)
            System.out.print(g[e]+"");
        System.out.println();
        a=dw_len;
        for(e=a;e<a+N-1;e++)
            t[e]=0;
        System.out.println("Extended dataword is");
        for(e=0;e<a+N-1;e++)
            System.out.print(t[e]+"");
        System.out.println();

        crc(); //sender side

        System.out.println("Checksum is");
        for(e=0;e<N-1;e++)
            System.out.print(cs[e]+"");
        System.out.println();
        for(e=a;e<a+N-1;e++)
            t[e]=cs[e-a];
        System.out.println("codeword is");
        for(e=0;e<a+N-1;e++)

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        System.out.print(t[e]+"");
        System.out.println();
        System.out.println("Enter received code word (may or may
not have error)");
        for(k=0;k<a+N-1;k++)
            t[k]=scan.nextInt();
        System.out.println("received data is ");
        for(k=0; k<a+N-1;k++)
            System.out.print(t[k]+" ");
        System.out.println();
        System.out.println("calling CRC on receiver
side");

        crc(); //receiver side

        for(e=0; (e<N-1) && (cs[e] !=1); e++);

        if(e<N-1)

            System.out.println("Error");
        else
            System.out.println("NO error");

        }

}

```