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import java.io.*;
public class Astable
{
    static String uvc="";
    static String uic="";
    static String uf="";
    static String ud="";
    static double Vcc=0;
    static double Ic=0;
    static double f=0;
    static double dc=0;
    static double hfe=0;
    static double R1=0;
    static double R2=0;
    static double Rc1=0;
    static double Rc2=0;
    static String mat="";

    static double Vce=0;
    static double Vbe=0;
    static double Ib=0;
    static double T=0;
    static double Ton=0;
    static double Toff=0;

    static double C1=0;
    static double C2=0;



    public void input() throws IOException
    {
        BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        boolean p=true;
        while(p)
        {
            p=false;
            System.out.print("Enter the material of transistor used    :  ");
            mat=br.readLine();
            if(mat.charAt(0)=='g' || mat.charAt(0)=='G')
            {
                Vce=0.1;Vbe=0.3;
            }
            else
            {
                Vce=0.2;Vbe=0.7;
            }


            System.out.print("Enter the external peak to peak voltage             :  ");
            Vcc=Double.valueOf(br.readLine());
            System.out.print("Enter the units of external peak to peak voltage     :  ");
            uvc=br.readLine();
            uvc=uvc.trim();
            if(uvc.equals("GV"))
            {Vcc*=Math.pow(10,9);}
            else if(uvc.equals("MV"))
            {Vcc*=Math.pow(10,6);}
            else if(uvc.equals("kV"))
            {Vcc*=Math.pow(10,3);}
            else if(uvc.equals("V"))
            {Vcc*=Math.pow(10,0);}
            else if(uvc.equals("mV"))
            {Vcc*=Math.pow(10,-3);}
            else if(uvc.equals("uV"))
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{Vcc*=Math.pow(10,-6);}
else if(uvc.equals("nV"))
{Vcc*=Math.pow(10,-9);}
else
{System.out.println("Wrong Units!!\n\nPress Enter to enter data once again.");
 uvc=br.readLine();p=true;continue;}


System.out.print("Enter the collector when transistor is in saturated
region                                        :  ");
Ic=Double.valueOf(br.readLine());
System.out.print("Enter the units of collector current when transistor is in
saturated region                          :  ");
uic=br.readLine();
uic=uic.trim();
if(uic.equals("GA"))
{Ic*=Math.pow(10,9);}
else if(uic.equals("MA"))
{Ic*=Math.pow(10,6);}
else if(uic.equals("kA"))
{Ic*=Math.pow(10,3);}
else if(uic.equals("A"))
{Ic*=Math.pow(10,0);}
else if(uic.equals("mA"))
{Ic*=Math.pow(10,-3);}
else if(uic.equals("uA"))
{Ic*=Math.pow(10,-6);}
else if(uic.equals("nA"))
{Ic*=Math.pow(10,-9);}
else
{System.out.println("Wrong Units!!\n\nPress Enter to enter data once again.");
 uic=br.readLine();p=true;continue;}


System.out.print("Enter the value of frequency     :  ");
f=Double.valueOf(br.readLine());
System.out.print("Enter the units of frequency     :  ");
uf=br.readLine();
uf=uf.trim();
if(uf.equals("GHz"))
{f*=Math.pow(10,9);}
else if(uf.equals("MHz"))
{f*=Math.pow(10,6);}
else if(uf.equals("kHz"))
{f*=Math.pow(10,3);}
else if(uf.equals("Hz"))
{f*=Math.pow(10,0);}
else if(uf.equals("mHz"))
{f*=Math.pow(10,-3);}
else if(uf.equals("uHz"))
{f*=Math.pow(10,-6);}
else if(uf.equals("nHz"))
{f*=Math.pow(10,-9);}
else
{System.out.println("Wrong Units!!\n\nPress Enter to enter data once again.");
  uf=br.readLine();p=true;continue;}

System.out.print("Enter the value of duty cycle     :  ");
dc=Double.valueOf(br.readLine());
System.out.print("Enter the units of duty cycle     :  ");
ud=br.readLine();
ud=ud.trim();
if(ud.charAt(0)=='%' || ud.charAt(0)=='P' || ud.charAt(0)=='p')
{dc/=100;}

System.out.print("Enter the value of hfe      :   ");
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            hfe=Double.valueOf(br.readLine());
        }
    }
    public void calculate()
    {
        Rc1=(Vcc-Vce)/Ic;
        Rc2=Rc1;
        Ib=(1.5*Ic)/hfe;
        R1=(Vcc-Vbe)/Ib;
        R2=R1;
        T=1/f;
        Ton=T*dc;
        Toff=T-Ton;
        C1=Ton/(0.693*R1);
        C2=Toff/(0.693*R2);
    }
    public void print()
    {
        System.out.println("\n");
        System.out.println("\n");
        System.out.println("Rc1    =  "+((Rc1)/1000)+"k ohm");
        System.out.println("Rc2    =  "+((Rc2)/1000)+"k ohm");
        System.out.println("R1     =  "+((R1)/1000)+"k ohm");
        System.out.println("R2     =  "+((R2)/1000)+"k ohm");
        System.out.println("C1     =  "+((C1*1000000))+" uF");
        System.out.println("C2     =  "+((C2*1000000))+" uF");
        System.out.println("\n");
        System.out.println("\n");
    }
    public static void main(String args[]) throws IOException
    {
        Astable mul=new Astable();
        mul.input();
        mul.calculate();
        mul.print();
    }
}
```