平成23年度基盤システム演習A第6回レポート

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目 次

◆課題

1 Function

```
//Function.java

public class Function {

    public double f( double x ) {
        return 1 - Math.pow( Math.E,  -2 * Math.pow( x, 2.0 ) ) ;
    }

    public double g( double x ) {
        return ( 1/3 * Math.pow( x, 3.0 ) ) - ( -4 * Math.pow( x, 2.0 ) ) + ( 15.0 * x ) + 3;
    }

    public double h( double x ) {
        return ( 2/Math.PI * Math.asin(x) ) + 2/Math.PI * x * Math.sqrt( 1 - Math.pow( x, 2 ) );
    }

    public int r( int k ) {
        int comp = (int)(Math.floor(Math.random() * k) + 1);
        for( int i = 1; i < k; i++ ) {
            int rand = (int)(Math.floor(Math.random() * k) + 1);

            if( comp < rand ) {
                comp = rand;
            }
        }
        return comp;
    }

    public static void main( String [] args ) {
        Function f1 = new Function();
        System.out.println( "f(-0.3) = " + f1.f( -0.3 ) );
        System.out.println( "f( 0.7) = " + f1.f(  0.7 ) );
        for(int i = 1; i < 13; i++) {
            System.out.println( "g(" + i + ")    = " + f1.g( i ) );
        }
        System.out.println( "h(-PI/8) = " + f1.h( -Math.PI/8 ) );
        System.out.println( "h( PI/4) = " + f1.h(  Math.PI/4 ) );
        System.out.println( "r(99)    = " + f1.r( 99 ) );
    }
}
```

2 Date,Calendar

```
//MyDate.java
import java.util.*;
import java.io.*;

public class MyDate {
    public static void main( String [] args ) {
        int year  = 0;
        int month = 0;
        int day   = 0;

        Calendar cal = Calendar.getInstance();

        try {
            InputStreamReader fr = new InputStreamReader(System.in);
            BufferedReader    br = new BufferedReader(fr);

            System.out.println("Input year");
            year  = Integer.valueOf(br.readLine()).intValue();

            System.out.println("Input month");
            month = Integer.valueOf(br.readLine()).intValue();

            System.out.println("Input day");
            day   = Integer.valueOf(br.readLine()).intValue();
        }
        catch(Exception e) {
            System.out.println(e);
        }

        cal.set( year, month-1, day );
        int dayOfYear = cal.get(Calendar.DAY_OF_YEAR);
        int thisYear  = cal.get(Calendar.YEAR);
        int thisMonth = cal.get(Calendar.MONTH)+1;
        int thisDay   = cal.get(Calendar.DATE);

        System.out.println("Today is Year:"+ thisYear + " Month:"+ thisMonth +" Day:"+ thisDay);
        System.out.println("Today is "+ dayOfYear +"Day of Year"+ thisYear);

        switch( cal.get(Calendar.DAY_OF_WEEK) ) {
        case 1: System.out.println("Sunday");    break;
        case 2: System.out.println("Monday");    break;
        case 3: System.out.println("Tuesday");   break;
        case 4: System.out.println("Wednesday"); break;
        case 5: System.out.println("Thursday");  break;
```

```
        case 6: System.out.println("Friday");    break;
        case 7: System.out.println("Satday");    break;
        }
    }
}
```

3 Cylinder,Output

```
//Cylinder.java

public class Cylinder {
    private float radius;
    private float height;

    public Cylinder() {
        this.radius = 0;
        this.height = 0;
    }

    public Cylinder( float r, float h ) {
        this.radius = r;
        this.height = h;
    }

    public float area() {
        return ( (radius * radius * (float)Math.PI * 2)
                 + (radius * 2 * (float)Math.PI * height) );
    }

    public float volume() {
        return (radius * radius * (float)Math.PI * height );
    }
}
```

```
//Output.java
import java.io.*;

public class Output {
    static Cylinder mycylinder;
    static Cylinder [][] cylArray;

    public static void printresult(float r, float h, float area, float volume) {
        System.out.println("Cylinder: r= "+ r +" h= "+ h +" area= "+ area +" volume= "+ volume);
    }

    public static void printfile(Cylinder [][] cylArray) {
```

```
        try {
            FileWriter f      = new FileWriter("result");
            BufferedWriter bw = new BufferedWriter(f);
            PrintWriter pw    = new PrintWriter(bw);

            pw.println("   h=  1  2  3  4  5  6");
            pw.println("r= 1"+ cylArray[0][0].area()+ " " + cylArray[0][1].area()+ " " + cylArray[0][2]
            pw.println("r= 2"+ cylArray[1][0].area()+ " " + cylArray[1][1].area()+ " " + cylArray[1][2]
            pw.println("r= 3"+ cylArray[2][0].area()+ " " + cylArray[2][1].area()+ "  " + cylArray[2][2
            pw.println("r= 4"+ cylArray[3][0].area()+ " " + cylArray[3][1].area()+ " " + cylArray[3][2]
            pw.println("r= 5"+ cylArray[4][0].area()+ " " + cylArray[4][1].area()+ "  " + cylArray[4][2
            pw.println("r= 6"+ cylArray[5][0].area()+ "  " + cylArray[5][1].area()+ "  " + cylArray[5][
            pw.flush();
            pw.close();
        }
        catch(Exception e) {
            System.out.println(e);
        }
    }

    public static void main(String [] args) {
        float r = 10;
        float h = 20;
        Cylinder mycylinder    = new Cylinder( r, h );
        Cylinder [][] cylArray = new Cylinder[6][6];
        printresult( r, h, mycylinder.area(), mycylinder.volume() );

        for(int i = 0; i < 6; i++) {
            for(int k = 0; k < 6; k++) {
                cylArray[i][k] = new Cylinder(i+1, k+1);
            }
        }
        printfile( cylArray );
    }
}
```