joPAS

Grupo PAS – Universidad de Deusto
http://jopas.sourceforge.net

1. joPAS programming guide

1.1. What is joPAS?

The joPAS API has been created by Group PAS of the University of Deusto. It allows the programmer to use the Octave language calculation power from Java, the user can create programs in Java with the advantage of implementing all the mathematical part in Octave. In addition, the syntax of Octave is compatible with Matlab, and all the sentences created for Matlab also can be used in joPAS.

1.2. Requirements

In order to be able to develop applications using the joPAS API, the java JDK 1.5 version and Octave interprets must be installed.

1.3. Passing variables from JAVA to OCTAVE

```
import org.jopas.*;

public class Example1 {

        public Example1() {

        Jopas jopas = new Jopas(); //joPAS inicialitation

        double a = 6;
        jopas.Load(a,"a");

        double b = 2;
        Matrix mb= new Matrix (b,"b");
        jopas.Load(mb);

        Matrix A = jopas.Save("a");
        System.out.println(A.getRealAt(0,0));

        Matrix B = jopas.Save("b");
        System.out.println(B.getRealAt(0,0));

        System.exit(0);
    }

public static void main(String av[]) {

        Example1 example1 = new Example1();
    }
}
```

1.4. Passing vectors from JAVA to OCTAVE

```
import org.jopas.*;

public class Example2 {


   /**
    * The constructor of the class have to start joPAS to run Octave because
    * Octave program takes a long time to start
    */
   public Example2() {
      Jopas jopas = new Jopas(); //joPAS inicialitation

      double[] aA= {1,2,3,4};
      Matrix mA= new Matrix (aA,"vA");
      jopas.Load(mA);

      Matrix mA2 = jopas.Save("vA");

      String smA2 = mA2.toString();
      System.out.println(smA2);
      System.out.println("v(0)="+mA2.getRealAt(0,0));
      System.out.println("v(1)="+mA2.getRealAt(0,1));
      System.out.println("v(2)="+mA2.getRealAt(0,2));
      System.out.println("v(3)="+mA2.getRealAt(0,3));

      System.exit(0);
   }

  public static void main(String av[]) {

      Example2 example2 = new Example2();

   }
}
```

1.5. Running sentences in OCTAVE

```
import org.jopas.*;

public class Example3 {


   /**
    * The constructor of the class have to start joPAS to run Octave because
    * Octave program takes a long time to start
    */
   public Example3() {
      Jopas jopas = new Jopas(); //joPAS inicialitation

      double[] aA= {1,2,3,4};
      Matrix mA= new Matrix (aA,"vA");
      jopas.Load(mA);

      double[] aB= {5,3,8,1};
      Matrix mB= new Matrix (aB,"vB");
      jopas.Load(mB);

      jopas.Execute("vY=vA+vB");

      Matrix mY = jopas.Save("vY");

      String smY = mY.toString();
      System.out.println(smY);

      System.exit(0);
   }

  public static void main(String av[]) {

      Example3 example3 = new Example3();

   }
}
```

1.6. Running functions in OCTAVE

```
import org.jopas.*;

public class Example4 {


    /**
     * The constructor of the class have to start joPAS to run Octave because
     * Octave program takes a long time to start
     */
    public Example4() {
        Jopas jopas = new Jopas(); //joPAS inicialitation


        jopas.Load(5,"a");
        jopas.Load(7,"b");

        jopas.Execute("function y=suma(a,b)");
        jopas.Execute("y=a+b");
        jopas.Execute("endfunction");

        jopas.Execute("y=suma(a,b)");

        Matrix mY = jopas.Save("y");

        System.out.println(mY.getRealAt(0,0));

        System.exit(0);
    }

  public static void main(String av[]) {

        Example4 example4 = new Example4();

    }
}
```

1.7. Charts with joPAS

```
import org.jopas.*;

public class Example5 {


   /**
    * The constructor of the class have to start joPAS to run Octave because
    * Octave program takes a long time to start
    */
   public Example5() {
      Jopas jopas = new Jopas(); //joPAS inicialitation


      jopas.Execute("y=rand(1,50)");
      jopas.plot("y");
   }

  public static void main(String av[]) {

      Example5 example5 = new Example5();

   }
}
```

1.8. First GUI using joPAS

```
import java.awt.*;
import org.jopas.*;

public class Example6 extends Frame {

JopasLabel plot;
Jopas jopas;
TextField aleatorio;

  public Example6() {
    jopas = new Jopas ();
    aleatorio= new TextField();
    aleatorio.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
      aleatorioActionPerformed(evt);
      }
        });
    addWindowListener( new java.awt.event.WindowAdapter()       {
      public void windowClosing(java.awt.event.WindowEvent evt) {
      System.exit(0);
      }
    });
    plot = new JopasLabel(jopas);
    add( "South",aleatorio );
    add( "Center",plot );
    jopas.Execute("y=rand(1,20)");
    plot.paintLabel("y","Example 6","Samples","Value");
    pack();
        setSize(300,300);
        setVisible(true);
    }

  private void aleatorioActionPerformed(java.awt.event.ActionEvent evt) {
    Matrix L = new Matrix(Double.parseDouble(aleatorio.getText()), "L");
    jopas.Load(L);
    jopas.Execute("y=rand(1,L)");
    plot.paintLabel("y","Example 6","Samples","Value");
    }

  public static void main( String args[] ) {
    Example6 example6 = new Example6();
    }
  }
```