Submission Title
Miscellaneous

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Problem Statement
This submission collects some odds and ends that do not deserve a full submission in their own right. They discuss tools that are pedagogically useful and so may interest the Task Force.

Solution Overview

1. ArrayPanel
   ArrayPanel is an abstract class implementing the interface TypedView whose purpose is to provide for the input of a dynamic array of Stringable objects. This panel provides facilities to increase or decrease the number of input views in the panel. One example of its usage is to create a GUI for the entry of the coefficients of a polynomial. Since the user may want to change the degree of the polynomial, it is essential that the number of views be under user control.

   To implement ArrayPanel, it is necessary to build a derived class that implements the abstract methods. It is also recommended that the designer override the protected method createViewFor. It is this method that constructs the views for the items in the array. By default, this method returns a vanilla TextFieldView. It is likely that the designer will want to return a more sophisticated view.

   Since an ArrayPanel may have few views when it is initialized, it is important to allow space for dynamic growth by the user. It is recommended that the ArrayPanel be inserted into a wrapper of type JPTScrollPane or of type ScrollableDisplay.

2. PauseThread
   The class JPTUtilities has a useful method:
   
   public static void pauseThread(long milliseconds)

   The advantage of this method over the Java method Thread.sleep is that any InterruptedException is caught and ignored. This avoids the need for a try-catch clause.

3. MathUtilities
   MathUtilities collects several useful static mathematical functions including trigonometric functions in degrees, random numbers in bounded ranges, and the greatest common divisor functions. The class may be viewed as an extension of the tools found in java.lang.Math.

4. Hex
   Hex provides methods for the conversion of numeric types to hexadecimal strings and vice versa.

5. Conversions
   Conversions contains type conversion utility functions suitable for processing byte sequences and byte arrays and for conversion of integral values (short, int, or long) to floating values (float or double) that are between -1 and +1. The utilities may be useful for processing byte streams going into or coming out of disk files or external devices.

6. FileUtilities
   FileUtilities provides utility methods that encapsulate file input and output operations and that handle directory manipulation including copying, renaming, and deleting.

Experience with the Solution
Each of the tools discussed here have proven useful at one time or another in pedagogy or in the creation of demo programs.

In the various JPT submissions, we have emphasized those classes and methods that would interest faculty and students directly. We have not discussed the remaining classes that are infrastructure.

API Documentation & Related Materials
The main JPT site to access documentation, code, and the jpt.jar:
http://www.ccs.neu.edu/jpt/