Dynamic Data Viewer

Easily Study Arbitrary Subsets of Data

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1. Introduction

Have you ever made a plot of data in Excel or a similar program and wished the result wasn't so static? Static plots are great to convey information about a certain subset of the data, but to *thoroughly* study the data, a more versatile tool would be nice to have, and this is what I set out to create.

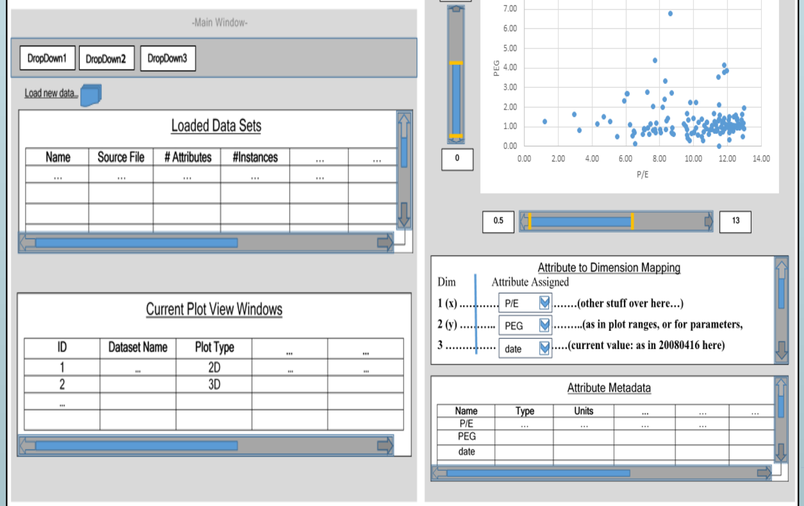
2. Objectives

- Dynamic manipulation of Cartesian coordinate system plots
  - initially 2D, eventually 3D
- Ability to load multiple data sets and create multiple plots
- Support of standard numeric and categorical data types
- Flexible movement from big picture to intricate detail easily with multiple degrees of freedom
  - special on-screen controls
  - key binding capability

Two primary user level components:

Main Window mock-up

2D Plot Viewer Window mock-up



3. Methods

- MVC design pattern
- Choice:
  - -1) 95% Java, 5% Mathematica (plot images)
    vs.
  - -2) 100% Mathematica
- Decided to try MVC using solely the Mathematica language

Model
- Plot data and related parameters
- "subset specification"

View
- Use rich array of Mathematica graphical functions
- i.e. Row/Column, Panel, Pane, Grid, Button, Slider, etc.

Controller
- Primarily use special function Dynamic[]
  - controller free?
  - not quite!
- some special modules

Modules

- Attribute
- Dataset
- AttributeSubsetParameters
- DatasetSubsetSpecification
- 2DPlotModel

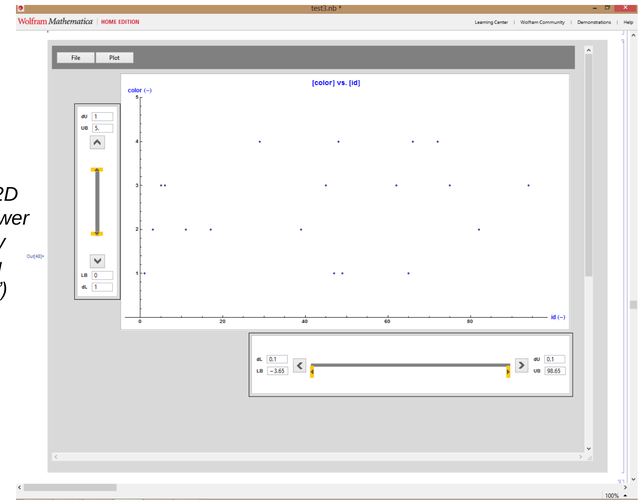
- MainWindow
- 2DPlotViewer

- Use Dynamic[]!
- SubsetManipulator
- More later…

4. Results

- Hurdle: Mathematica Novice
  - Eventually severely hindered continued development
- Nevertheless, acceptable progress despite setbacks:

Part of 2D Plot Viewer currently (the "big kahuna")



5. Conclusion

Primary Causes of Problems:

- Not enough time spent learning Mathematica prior to design/implementation
- Tried to mimic OO experience too much
- Incomplete understanding of proper usage of Dynamic[]
- Insufficient knowledge of best practices

Plans to Reassess and Move Forward:

- No worries, learned a lot; the project is a work in progress
- Worthwhile to dig deeper into Mathematica
  - Learn functional programming *thoroughly*
  - Learn pattern/rule-based programming *thoroughly*
  - Pick which is best for this tool, then revise/adapt
- Back-up plan is Java