

# GNU Spread Sheet Widget

John Darrington PhD, BSc (hons)

GNU

August 26, 2017



# What is it?

- It's a GNU program.
- It's a library.
- It's a Gtk+ widget.
- It's a viewer for tabular data.
- It's an editor interface.

It is *not*:

- A spreadsheet.



# What does it look like?

Case	sex	height	weight	temperature	Var	Var	Var	Var
1	Male	1799	90.9	37.53				
2	Male	1799	90.4	37.33				
3	Male	1800	88.9	37.03				
4	Male	1799	90.4	37.68				
5	Male	1645	92.1	36.68				
6	Male	1801	88.9	37.12				
7	Male	1800	89.5	36.10				
8	Male	1799	90.3	32.59				
9	Male	1800	91.0	37.60				
10	Male	1799	89.0	33.61				
11	Male	1801	90.5	34.42				
12	Male	1800	87.7	35.03				



# Features

- Unlimited number of rows/columns.
- Operations are  $O(1)$ .
- Memory allocated is  $O(1)$ .
  - Inserting.
  - Deleting.
  - Resizing.
- “Clipboard” and primary selection friendly.
- “Split” window.
- LTR friendly.
- A few bells and whistles . . .



# Why is it?

My search for a spreadsheet widget

In GNU PSPP, we provide a spread sheet like user interface.  
PSPP is a program for statistical analysis. It is not a spreadsheet.  
Previous attempts to provide the sheet view include:

- Gnumeric, Libreoffice.
- GtkSheet.
- GtkTreeView.



# Split Window

Sometimes it's useful to be able to see "both ends" of the data at the same time:

Case	a1_abdefect	a2_abdefect	a3_abdefect	a4_abdefect	a5_abdefect	a1_abdefect	a2_abdefect	a3_abdefect	a4_abdefect
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	2	2	2	2	2	2	2	2	2
4	0	0	0	0	0	0	0	0	0
5	2	1	1	2	2	2	1	1	2
6	1	1	1	1	1	1	1	1	1
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	2	2	2	2	2	2	2	2	2
10	1	1	1	1	1	1	1	1	1
11	2	2	2	2	2	2	2	2	2
12	0	0	0	2	2	2	0	0	2
13	2	1	1	1	1	2	1	1	1
14	1	1	1	1	1	1	1	1	1
15	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0
17	2	2	2	2	2	2	2	2	2
2003	2	1	1	2	2	2	1	1	2
2004	2	1	1	1	1	2	1	1	1
2007	0	0	0	0	0	0	0	0	0
2008	2	2	1	2	2	2	2	1	2
2009	2	2	2	2	2	2	2	2	2
2006	0	0	0	0	0	0	0	0	0
2000	2	2	2	2	2	2	2	2	2
2001	1	1	1	1	1	1	1	1	1

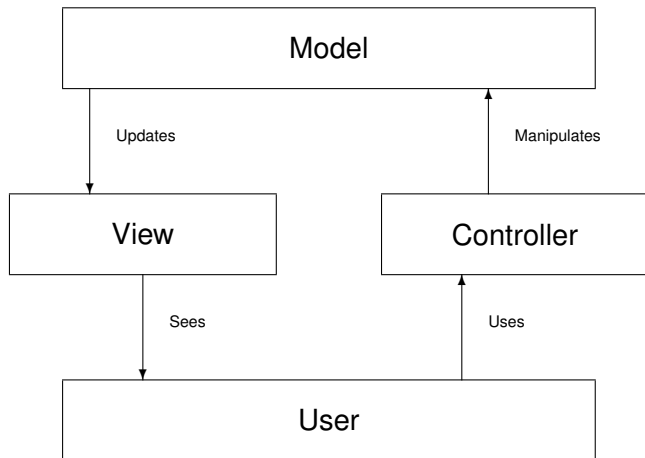


# How does it work?

- Model-View-Controller paradigm.
- Lazy allocation of rows/columns.
- Composite widget architecture.



# Model-View-Controller





There are three models!

- A model for the data.
  - The contents of the cells.
- A model for the column metadata.
  - The width of the column.
  - The label to be displayed in the column header.
  - ... other indicators.
- A model for the row metadata.
  - The height of the row.
  - ...



## The “row-inserted” signal

```
void  
user_function (GtkTreeModel *tree_model,  
GtkTreePath *path,  
GtkTreeIter *iter,  
gpointer user_data)
```

This signal is emitted when a new row has been inserted in the model.



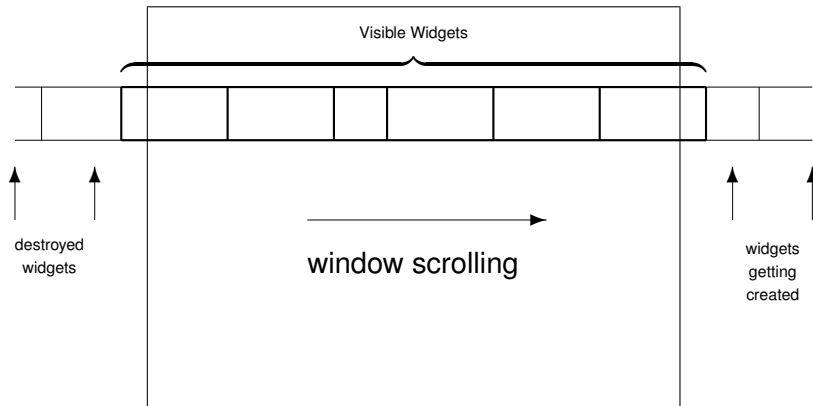
## The “items-changed” signal

```
void  
user_function (GListModel *list,  
              quint position,  
              quint removed,  
              quint added,  
              gpointer user_data)
```

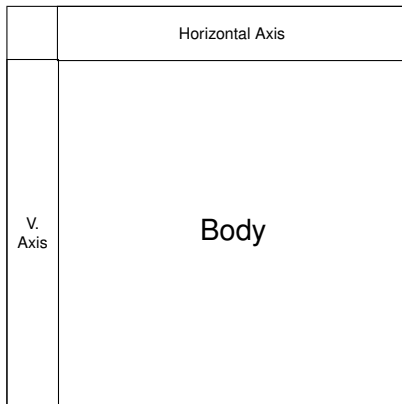
This signal is emitted whenever items were added or removed to list. At `position`, removed items were removed and added items were added in their place.



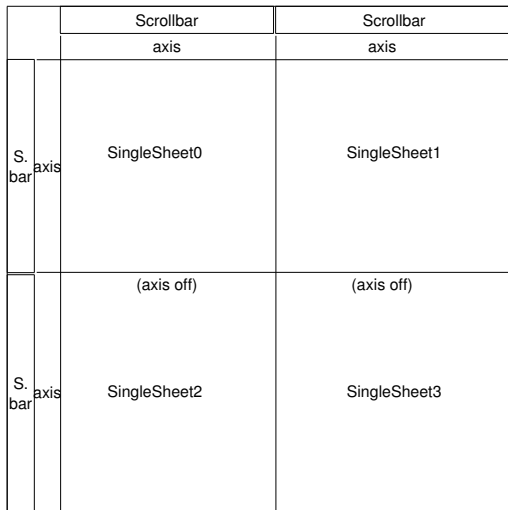
# Lazy Allocation



## SingleSheet (GtkGrid)



# ... Composite widget architecture



- Drag-n-drop
- Custom Cell Renderers
- Row Column Labeling



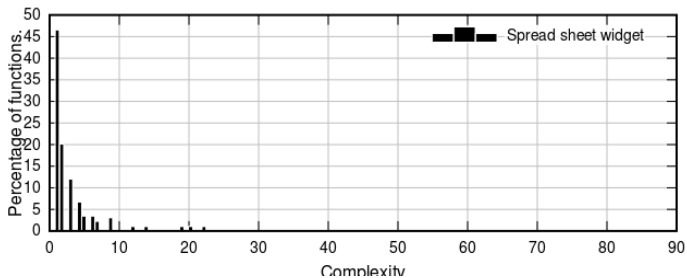
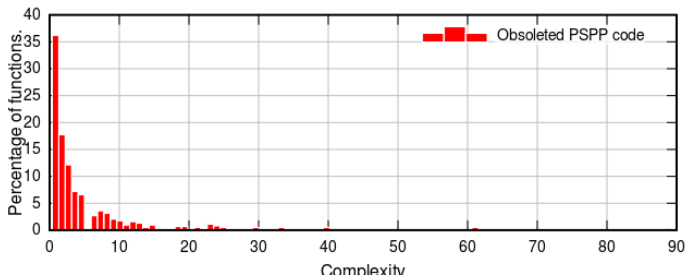
- 8120 lines of code.
- PSPP without spreadsheet-widget: 223,508
- PSPP with spreadsheet-widget: 199,987





# ... statistics

## McCabe Complexity



# To Do

- Documentation
- Tests.
- Utility functions.



For futher information...

<http://www.gnu.org/software/ssw>

