Converting program from GTK3 to GTK4

Original program: python-help-gui.gtk3.py

Final program: python-help-gui.gtk4.py

Migration Documentation: https://docs.gtk.org/gtk4/migrating-3to4.html

Code in: github.com/irsbugs/python-help

Converting program from GTK3 to GTK4

Original GTK3 program

```
1  #!/usr/bin/env python3
2  #!
3  # python-help-gui-gtk3.py
4  #
5  # The python help categories; to
6  # are made selectable with a mou
7  # displayed in a scrollable winc
8  #
9  # Tested on:
10 # ubuntu 20.04 / python 3.8.10
11 # ubuntu 22.04 / python 3.10.4
12 # manjaro 21.2.2 / python 3.10.5
13 #
```

To become the GTK4 program

```
1  #!/usr/bin/env python3
2  #!
3  # python-help-gui-gtk3_upgrade.py
4  #
5  # The python help categories; top
6  # are made selectable with a mous
7  # displayed in a scrollable windo
8  #
9  # Tested on:
10 # manjaro 21.2.2 / python 3.10.5
```

Gtk 3.0 to 4.0

Change gi.require_version to Gtk version 4.0...

```
18  import gi
19  try:
20      gi.require_version("Gtk", "3.0")
21  except ValueError as e:
22      print(e)
23      sys.exit("Unable to run {} program. Exiting...".format(sys.argv[0]))
24  from gi.repository import Gtk, Gdk
```

```
18  import gi
19  try:
20      gi.require_version("Gtk", "4.0")
21  except ValueError as e:
22      print(e)
23      sys.exit("Unable to run {} program. Exiting...".format(sys.argv[0]))
24  from gi.repository import Gtk, Gdk
```

Start running the program and see what errors are detected...

Gtk 3.0 to 4.0

Gtk.Window.add() replaced .set_child()

```
Traceback (most recent call last):
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 268, in <module>
    win = Window()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 57, in __init__
    self.add(self.grid)
AttributeError: 'Window' object has no attribute 'add'
```

```
56          self.grid = Gtk.Grid()
57          self.add(self.grid)
```

```
56          self.grid = Gtk.Grid()
57          #self.add(self.grid)
58          self.set_child(self.grid)
```

Gtk 3.0 to 4.0

.set_border_width() removed.

```
Traceback (most recent call last):
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 269, in <module>
    win = Window()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 60, in __init__
    self.create_textview()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 88, in create_textview
    scrolled_window.set_border_width(10)
AttributeError: 'ScrolledWindow' object has no attribute 'set_border_width'
```

```
88          scrolled_window.set_border_width(10)
88          #scrolled_window.set_border_width(10)
```

Quick fix – comment out the code

Gtk 3.0 to 4.0

.add_provider_for_screen()...

```
    self.create_textview()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 89, in create_textview
    self.set_style()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 79, in set_style
    Gtk.StyleContext.add_provider_for_screen(Gdk.Screen.get_default(),
AttributeError: type object 'StyleContext' has no attribute 'add_provider_for_sc
reen'. Did you mean: 'add_provider_for_display'?
```

```
79          Gtk.StyleContext.add_provider_for_screen(Gdk.Screen.get_default(),
80                  style_provider,
81                  Gtk.STYLE_PROVIDER_PRIORITY_APPLICATION)
```

...becomes .add_provider_for_display()

```
79          Gtk.StyleContext.add_provider_for_display(Gdk.Screen.get_default(),
80                  style_provider,
81                  Gtk.STYLE_PROVIDER_PRIORITY_APPLICATION)
```

Gtk 3.0 to 4.0

Gdk.Screen becomes Gdk.Display

```
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 89, in create_textview
    self.set_style()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 79, in set_style
    Gtk.StyleContext.add_provider_for_display(Gdk.Screen.get_default(),
  File "/usr/lib/python3.10/site-packages/gi/overrides/__init__.py", line 32, in
 __getattr__
    return getattr(self._introspection_module, name)
  File "/usr/lib/python3.10/site-packages/gi/module.py", line 123, in __getattr_
_
    raise AttributeError("%r object has no attribute %r" % (
AttributeError: 'gi.repository.Gdk' object has no attribute 'Screen'
```

```
79          Gtk.StyleContext.add_provider_for_display(Gdk.Display.get_default(),
80                  style_provider,
81                  Gtk.STYLE_PROVIDER_PRIORITY_APPLICATION)
```

More of the same... Gtk 3.0 to 4.0

```
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 96, in create_textview
    scrolled_window.add(self.textview)
AttributeError: 'ScrolledWindow' object has no attribute 'add'
```

```
 96             #scrolled_window.add(self.textview)
 97             scrolled_window.set_child(self.textview)
```

```
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 104, in setup_treeview
    scrolled_window.set_border_width(10)
AttributeError: 'ScrolledWindow' object has no attribute 'set_border_width'
```

```
104             #scrolled_window.set_border_width(10)
```

```
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 138, in setup_treeview
    scrolled_window.add(self.treeview)
AttributeError: 'ScrolledWindow' object has no attribute 'add'
```

```
138             #scrolled_window.add(self.treeview)
139             scrolled_window.set_child(self.treeview)
```

Gtk 3.0 to 4.0

Gtk.main_quit() removed...

```
Traceback (most recent call last):
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 271, in <module>
    win.connect("destroy", Gtk.main_quit)
  File "/usr/lib/python3.10/site-packages/gi/overrides/__init__.py", line 32, in
 __getattr__
    return getattr(self._introspection_module, name)
  File "/usr/lib/python3.10/site-packages/gi/module.py", line 123, in __getattr_
_
    raise AttributeError("%r object has no attribute %r" % (
AttributeError: 'gi.repository.Gtk' object has no attribute 'main_quit'
```

Gtk 3.0 to 4.0

Gtk3 way to launch the Window...

```
269     # Start up the window
270     win = Window()
271     win.connect("destroy", Gtk.main_quit)
272     win.show_all()
273     Gtk.main()
```

```
46  class Window(Gtk.Window):
47      def __init__(self):
48          Gtk.Window.__init__(self)
49
50          # Add the title to the window
51          version = sys.version.split(" ")[0]
52          self.set_title("Help for Python version {}".format(version))
53          # Set default window size
54          self.set_default_size(1400, 600)
```

Gtk 3.0 to 4.0

Gtk4 code to launch “Application()”...

```
269     # Start up the window
270     #win = Window()
271     #win.connect("destroy", Gtk.main_quit)
272     #win.show_all()
273     #Gtk.main()
274
275     # Run the application
276     app = Application()
277     app.run(sys.argv)
```

Gtk 3.0 to 4.0

Gtk.Application() function that “activates” and “presents” the Window

```
161 class Application(Gtk.Application):
162     ''' Main Application class '''
163     def __init__(self):
164         super().__init__(application_id='gtk4.python.help',
165                          flags=Gio.ApplicationFlags.FLAGS_NONE)
166 
167     def do_activate(self):
168         win = self.props.active_window
169         if not win:
170             win = Window(application=self)
171         win.present()
```

Gtk 3.0 to 4.0

Gtk.Window

```
46  #class Window(Gtk.Window):
47  #    def __init__(self):
48  #        Gtk.Window.__init__(self)
49  class Window(Gtk.Window):
50      def __init__(self, **kwargs):
51          super(Window, self).__init__(**kwargs)
52
53          # Add the title to the window
54          version = sys.version.split(" ")[0]
```

Gtk 3.0 to 4.0

Gio not imported...

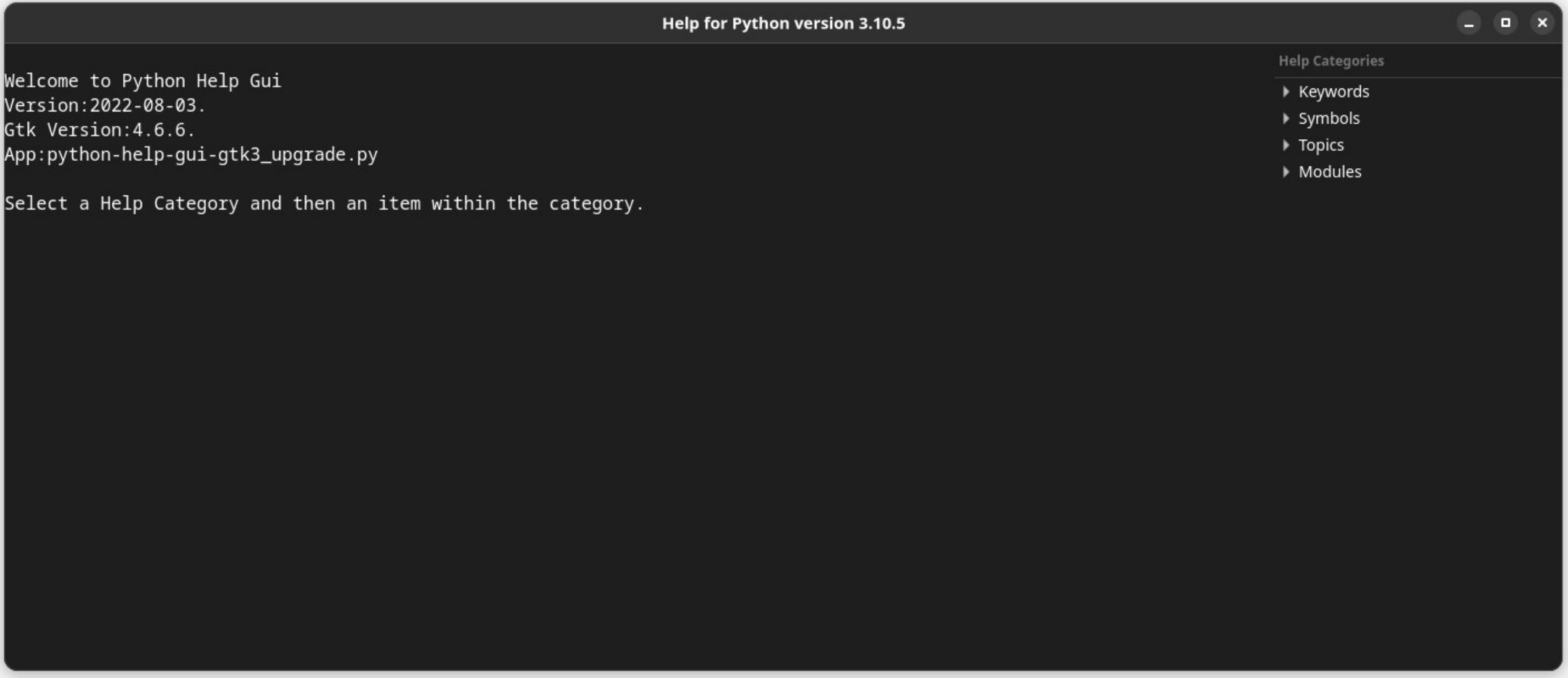
```
Traceback (most recent call last):
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 291, in <module>
    app = Application()
  File "/home/ian/python-help-gui-gtk3_upgrade.py", line 168, in __init__
    flags=Gio.ApplicationFlags.FLAGS_NONE)
NameError: name 'Gio' is not defined
```

Add Gio to the list of gi.repository imports...

```
18  import gi
19  try:
20      gi.require_version("Gtk", "4.0")
21  except ValueError as e:
22      print(e)
23      sys.exit("Unable to run {} program. Exiting...".format(sys.argv[0]))
24  from gi.repository import Gtk, Gdk, Gio
```

Gtk 3.0 to 4.0

Program launches using Gtk4 for the first time...



Note that there is no border / margin.

Gtk 3.0 to 4.0

One method of adding margins, which works but needs 4 lines of code...

```
93          #scrolled_window.set_border_width(10)
94          scrolled_window.set_margin_bottom(10)
95          scrolled_window.set_margin_end(10)
96          scrolled_window.set_margin_start(10)
97          scrolled_window.set_margin_top(10)
```

Alternative method of calling the set_style function and using CSS...

```
93          #scrolled_window.set_border_width(10)
94          #scrolled_window.set_margin_bottom(10)
95          #scrolled_window.set_margin_end(10)
96          #scrolled_window.set_margin_start(10)
97          #scrolled_window.set_margin_top(10)
98          self.set_style()
```

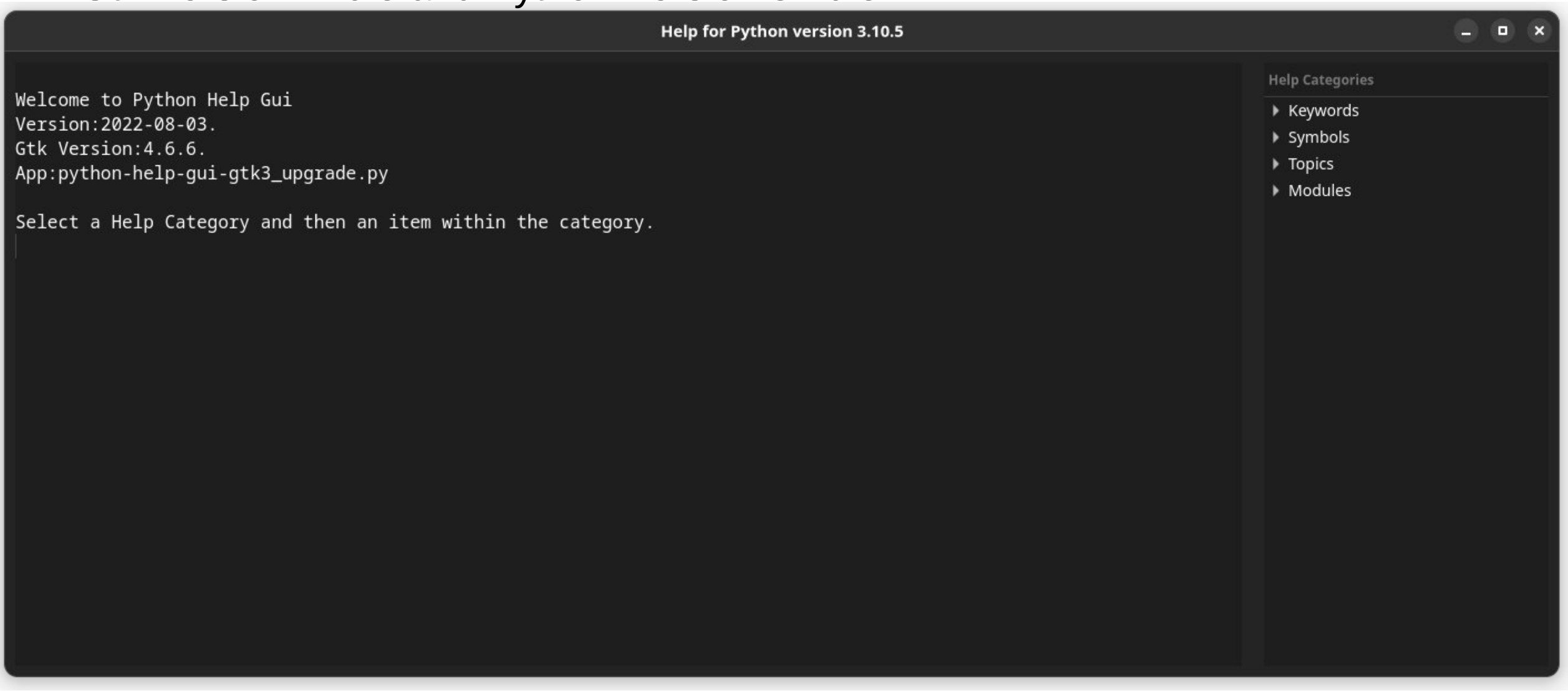
Gtk 3.0 to 4.0

Add “margin: 10px” to both the Textview and the Treeview widgets...

```
69      def set_style(self):
70          """ Loads custom CSS for textview and treeview"""
71          style_provider = Gtk.CssProvider()
72          style_provider.load_from_data(b"""
73          #textview {
74              font: 16px "Monospace";
75              margin: 10px;
76              /*color: #000000;  Black conflicts with dark theme*/
77              }
78          #treeview {
79              font: 14px Sans;
80              margin: 10px;
81              /* border-width: 10px; Around the column header */
82              }
83          """)
```

Gtk 3.0 to 4.0

Gtk Version: 4.6.5 and Python Version 3.10.5



...with 10px margins.

Gtk 3.0 to 4.0

Example: Displaying the Topic on OPERATORS...

Gtk 3.0 to 4.0

Display code / Demo program