

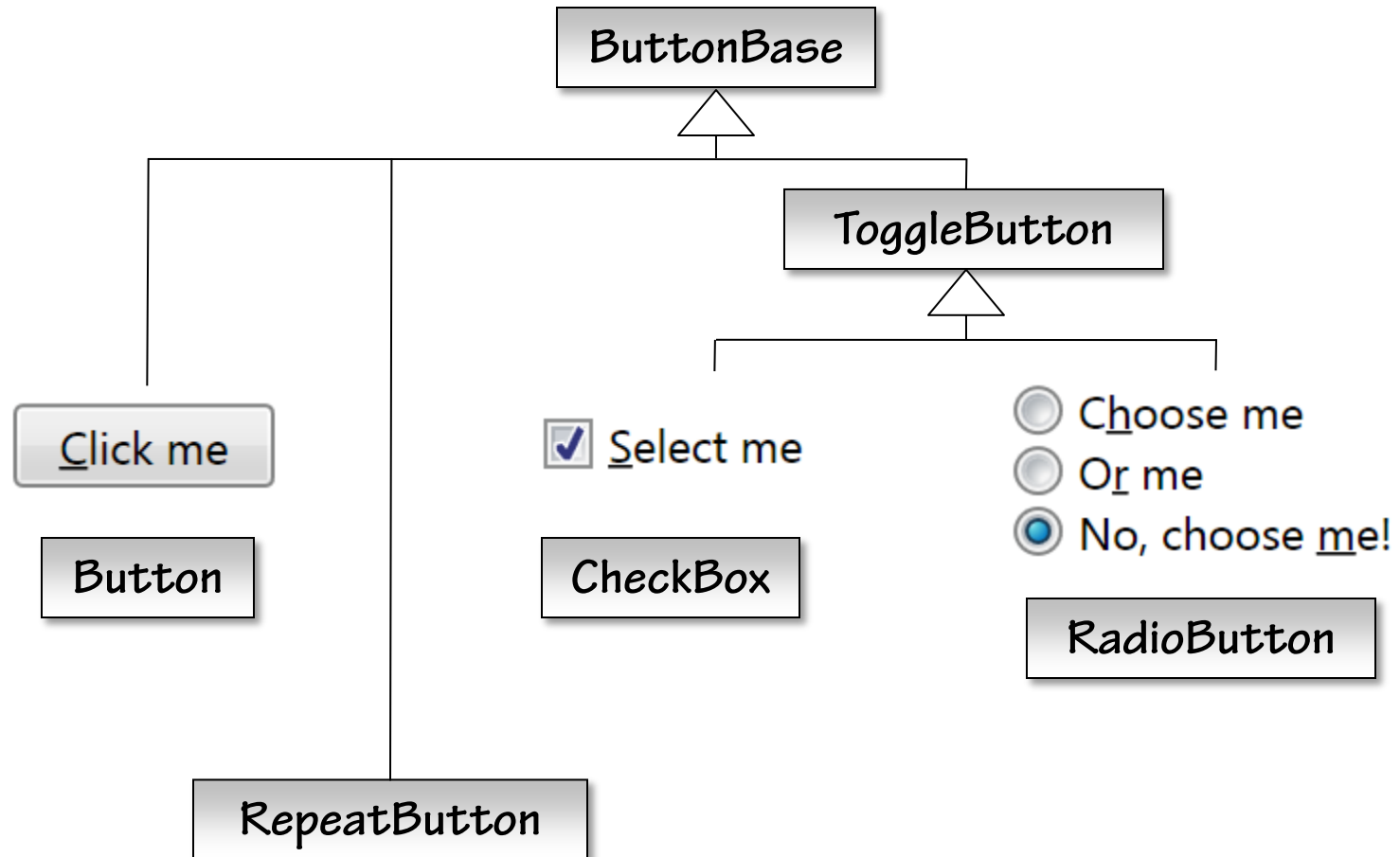
Controls



Outline

- Built-in controls
- Events
- Commands

Buttons



Content Model

- **Flexible caption**

- Text
- Arbitrary content
- Data

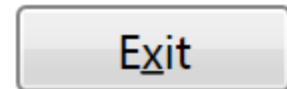
```
<Button>  
  <Ellipse Fill="Red" Width="50"  
    Height="15" Stroke="Black" />  
</Button>
```

- **Ubiquitous pattern**

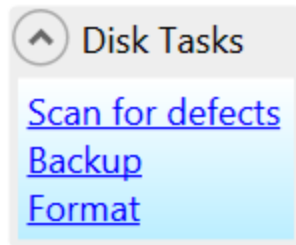
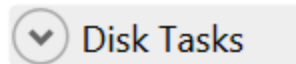


- **Access key**

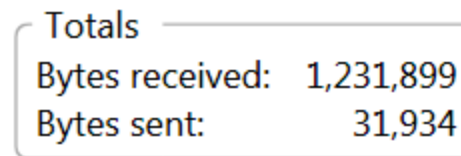
```
<Button>E_xit</Button>
```



Grouping Controls

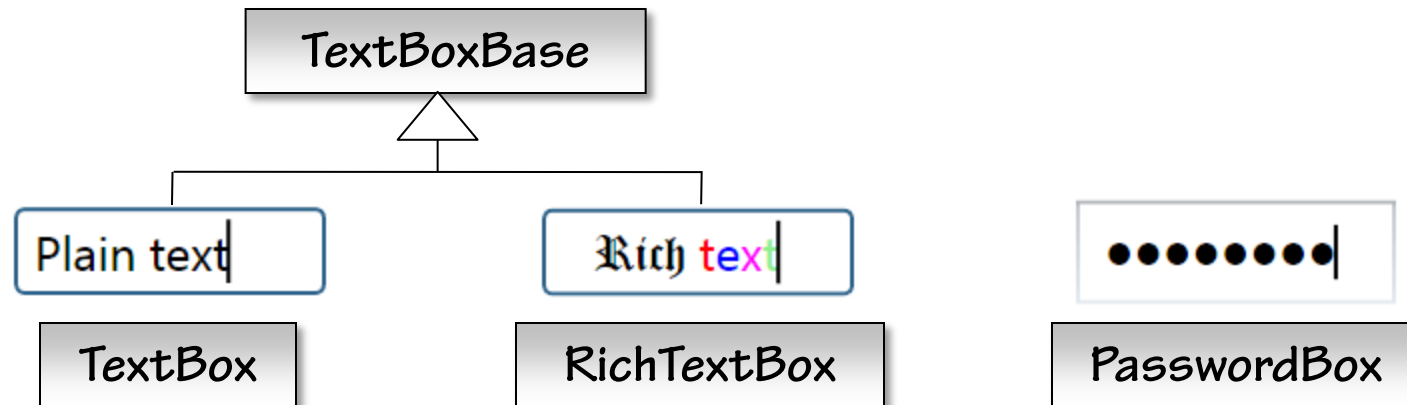


Expander



GroupBox

Text Input



Plain text

```
<TextBox SpellCheck.IsEnabled="True" />
```

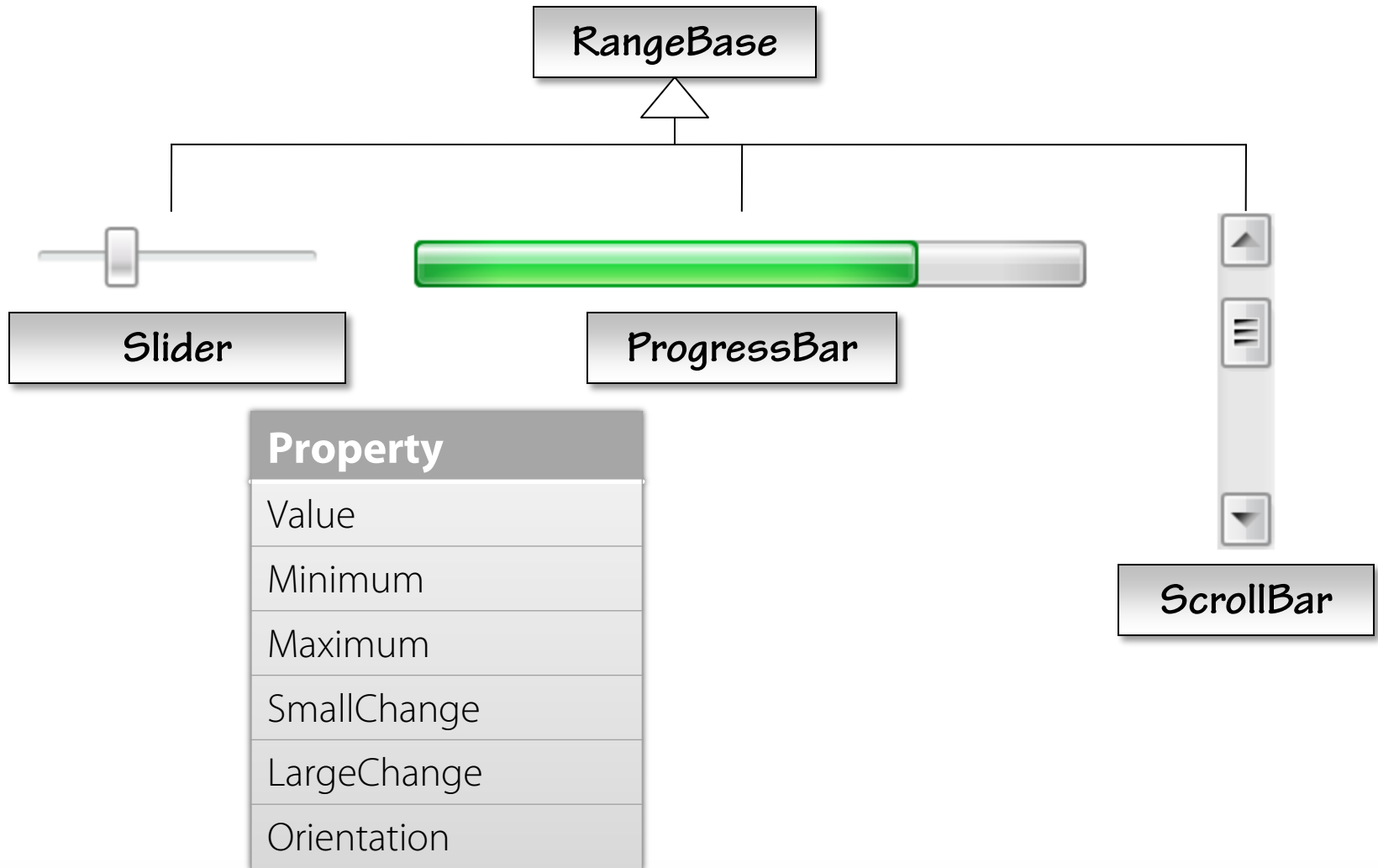
Name:

```

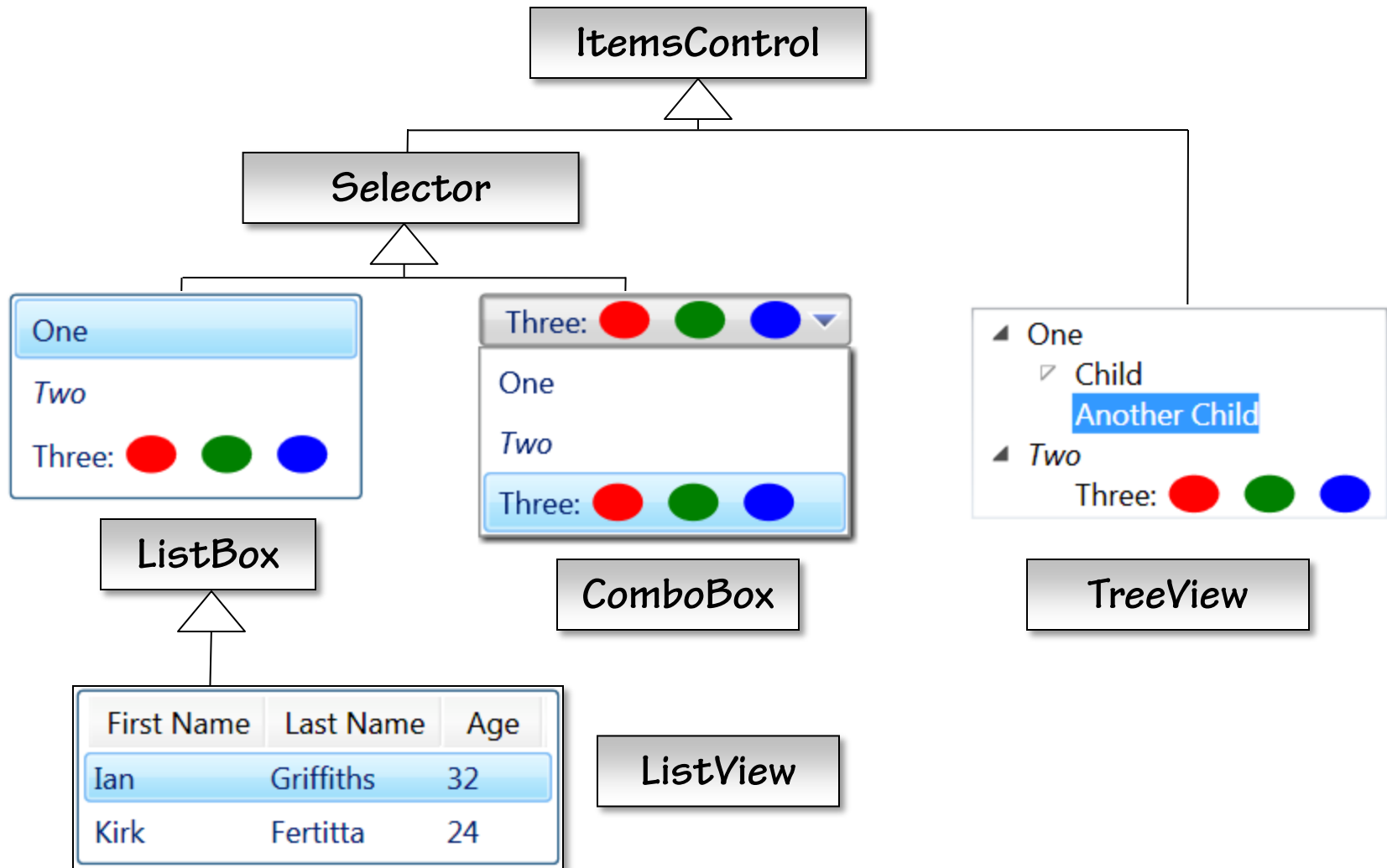
<StackPanel Orientation="Horizontal">
  <Label Target="{Binding ElementName=myTxt}">
    _Name:
  </Label>
  <TextBox x:Name="myTxt" />
</StackPanel>

```

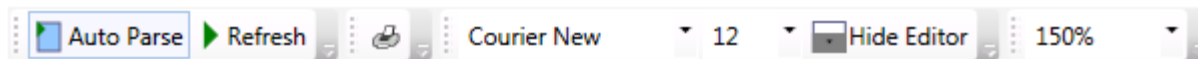
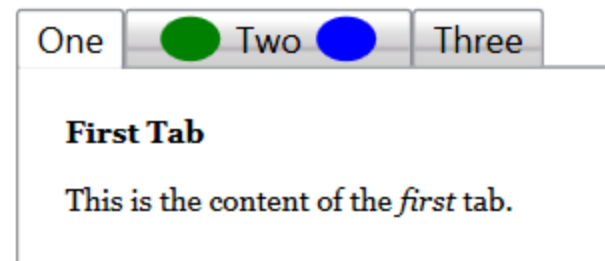
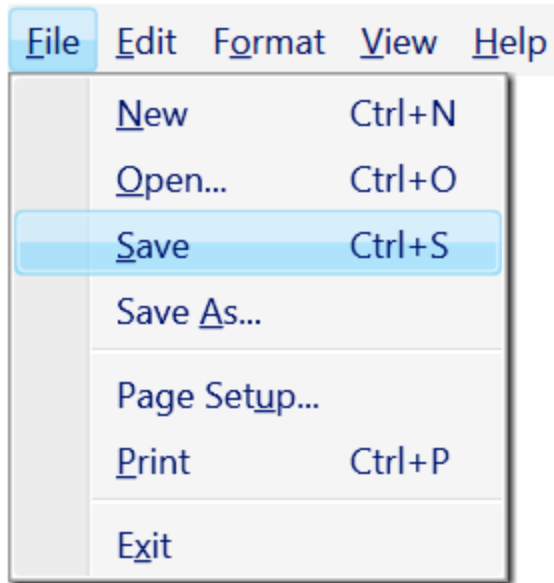
Range Controls



Items Controls



More Items Controls



Items Controls and Content Models

Content Model	Used By
Content Control	Button, Label
Headered Content Control	GroupBox, TabItem
Items Control	ListBox, ComboBox
Headered Items Control	MenuItem, TreeViewItem

Item Containers

- Items always wrapped

Control	Container
ListBox	ListBoxItem
ListView	ListViewItem
TreeView	TreeViewItem
Etc.	Etc.

- Generated automatically
 - Can supply explicitly for greater control

```
<TreeView>
  <TreeViewItem Header="Node">
    <TextBlock Text="Child" />
    <TextBlock Text="Child" />
  </TreeViewItem>
  <TextBlock Text="Node2" />
</TreeView>
```

Controls vs Elements

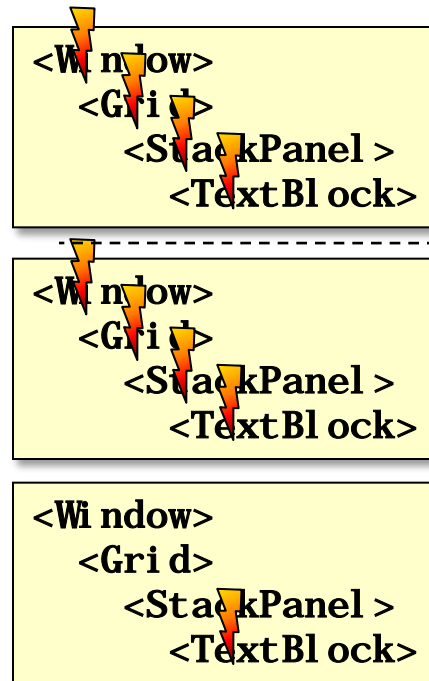
- **Not all elements are controls**
 - E.g. TextBlock, Image, Border, Ellipse
- **Control implies behavior**
 - Appearance replaceable

Events and Commands

- **Events – low-level**
 - Mouse up, down, enter, exit etc.
 - Pen and ink input, keyboard input
- **Commands – higher-level**
 - Raised by controls, e.g. menus, buttons
 - Input gestures, e.g. keyboard shortcuts

Event Routing

- **Tunneling**
 - Previews
- **Bubbling**
 - Main event
- **Direct**
 - E.g. MouseEnter



Bubble/Tunnel Pairs

PreviewMouseDown

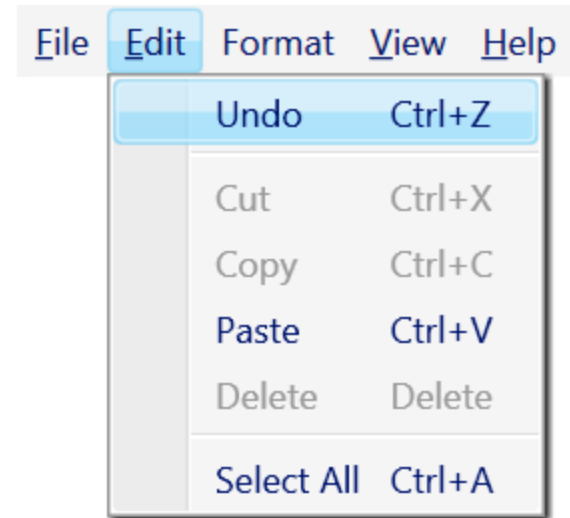
MouseDown

Built-in Commands

Command Class	Example Commands
ApplicationCommands	Print, Copy, Save
ComponentCommands	MoveDown, SelectToEnd, ScrollPageUp
EditingCommands	ToggleBold, Delete
MediaCommands	Pause, Play, IncreaseVolume
NavigationCommands	BrowseBack, Refresh

Menus and Commands

```
...  
<MenuItem Header="_Edit">  
  <MenuItem Command="Undo" />  
  <Separator />  
  <MenuItem Command="Cut" />  
  <MenuItem Command="Copy" />  
  <MenuItem Command="Paste" />  
  <MenuItem Command="Delete" />  
  <Separator />  
  <MenuItem Command="SelectAll" />  
</MenuItem>  
...
```



Menus

```
<Menu>
  <MenuItem Header="_File">
    <MenuItem Header="_New"
      InputGestureText="Ctrl+N" />

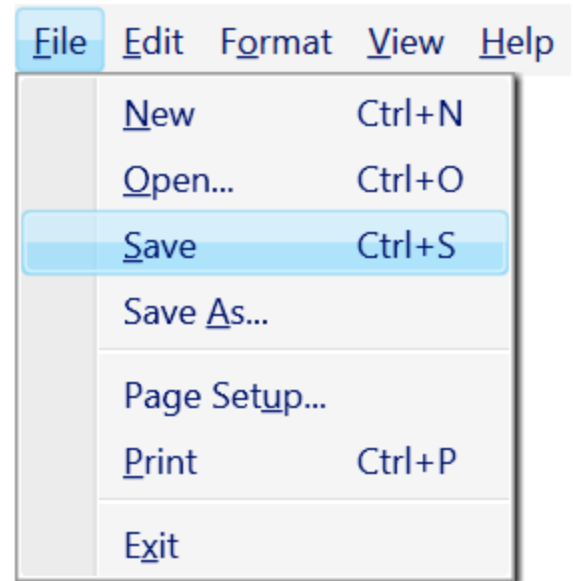
    <MenuItem Header="_Open..."
      InputGestureText="Ctrl+O" />

    <MenuItem Header="_Save"
      InputGestureText="Ctrl+S" />

    <MenuItem Header="Save _As..." />

    <Separator />

    <MenuItem Header="Page Set_up..." />
    <MenuItem Header="_Print"
      InputGestureText="Ctrl+P" />
    <Separator />
    <MenuItem Header="E_xit" />
  </MenuItem>
  ...
```



Summary

- Built-in controls
- Events
- Commands