

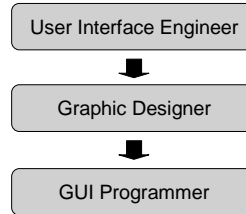
Software 1

Recitation No. 10:
SWT GUI Package

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The GUI Development Process

■ GUI: Graphical User Interface



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GUI Application

- When implementing a GUI application one should specify:
 - the GUI elements
 - the 2D arrangement of the GUI elements
 - the behavior of the GUI elements
- Java GUI libraries:
 - AWT (**A**bstract **W**indowing **T**oolkit)
 - Swing
 - SWT (**S**tandard **W**idget **T**oolkit)

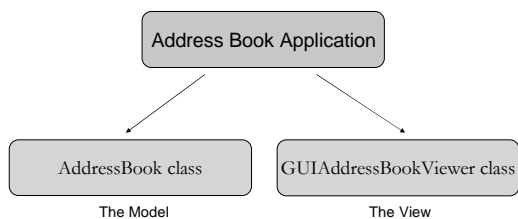
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Model-View Separation

- Separate between the application logic (**model**) part and the GUI (**view**) part.
- Ensures that view changes have no effect on the basic model
- Enables us to maintain one model for several different views

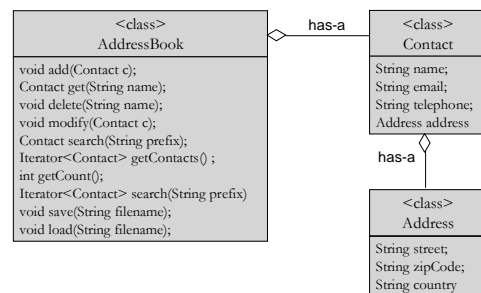
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Example: Address Book



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The Model



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The View

Address Book

File: Contacts 1945

Name	Email	Phone Number
Alman, David	da198@gmail.com	03-9414324
Alman, Rebecca	rebeca@gmail.com	03-9414324
Alman, Brian	br23@gmail.com	03-9414324
Alman, Eric	er1@gmail.com	03-9414324

New Address Book Ctrl+N
 Open Ctrl+O
 Save Ctrl+S

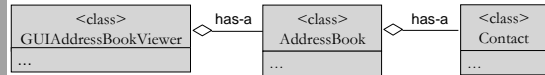
New Contact Ctrl+M
 Edit
 Delete

Name: Smith, John
 Email: smith@gmail.com
 Phone: 03-9414324
 Street Address: 211 Lakeshore St.
 City: Tel-Aviv
 Zip Code: 56743
 Country: Israel

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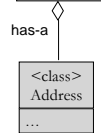
The View

■ The class diagram:



■ The implementation:

- based on the SWT GUI library



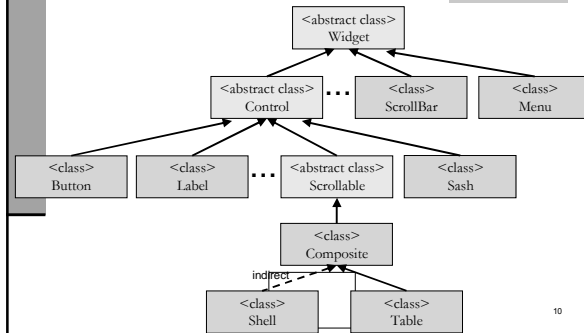
SWT

■ Online Documentation:

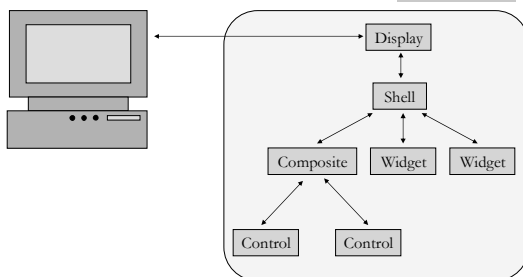
- SWT HomePage:
<http://www.eclipse.org/swt/>
- JavaDoc
- Snippets
- Getting Started with Eclipse and the SWT:
<http://www.cs.umanitoba.ca/~eclipse/>

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Widgets



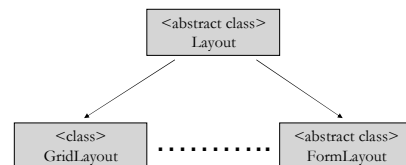
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Layouts

■ A Layout controls the position and size of Control widgets in a Composite.



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GridLayout

- Lays out the Control widgets in a grid.



Each column is as wide as Wide Button 2

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GridLayout

- Lays out the Control widgets in a grid.
- GridLayout Configuration fields:

Field	Default	Description
horizontalSpacing	5	Horizontal/vertical space between the grid cells
verticalSpacing	5	Horizontal/vertical space between the grid cells
marginHeight	5	The size of the horizontal/vertical margins of the layout
marginWidth	5	The size of the horizontal/vertical margins of the layout
numColumns	1	Number of columns
makeColumnsEqualWidth	false	If true, all columns will have the same size

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GridLayout (cont.)

GridData:

- Use GridData objects to configure the Control widgets in a GridLayout.
- Use the `setLayoutData()` to set a GridData object into a Control, e.g.
`label.setLayoutData(new GridData(...));`
- Do not reuse GridData objects

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GridLayout (cont.)

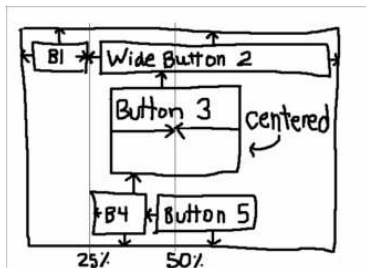
- GridData Configuration Fields:

Field	Default	Description
grabExcessHorizontalSpace	false	If true, the width/length of the widget will be as large as possible to fit the remaining space.
grabExcessVerticalSpace	false	If true, the width/length of the widget will be as large as possible to fit the remaining space.
heightHint	SWT.DEFAULT	A minimum width/height for the widget.
widthHint	(no minimum)	A minimum width/height for the widget.
horizontalSpan	1	the number of column/row cells that the widget will take up.
verticalSpan	1	the number of column/row cells that the widget will take up.
horizontalIndent	0	the number of indentation pixels along the left side of the cell.
horizontalAlignment	GridData.BEGINNING	how controls will be positioned horizontally/vertically within a cell.
verticalAlignment	GridData.CENTER	how controls will be positioned horizontally/vertically within a cell.

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FormLayout

- A very flexible layout



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FormLayouts

- A very flexible layout
- FormLayout Configuration Properties:

Field	Default	Description
marginHeight	0	the margin width/height
marginWidth	0	the margin width/height
spacing	0	the number of pixels between the edge of one control and the edge of its neighbouring control.

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FormLayouts (cont.)

- Use `FormData` objects to configure the Control widgets in a `FormLayout`.
- Use the `setLayoutData()` to set a `FormData` object into a Control widget.
- A `FormData` object has a `FormAttachment` object for each edge of the Control.

Field	Description
width/height	the desired width/height in pixels.
top/bottom/left/right	Specifies the position of the control attachment.

FormLayouts (cont.)

- A `FormAttachment` defines where to attach the side of a Control by using the equation: $y = ax + b$.

A fraction defined by:
-numerator
-denominator

an offset, in pixels

the width/height of a Control to which the control side is attached (**control**).

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FormLayouts (cont.)

■ Main `FormAttachment` Constructors:

- `public FormAttachment(Control control)`
- `public FormAttachment(Control control, int offset)`
- `public FormAttachment(int numerator)`
- `public FormAttachment(int numerator, int offset)`

Field	Default
control	Parent Composite
numerator	100
denominator	100
offset	0

$$y = \frac{\text{numerator}}{\text{denominator}} \cdot x + \text{offset}$$

x – control's width/height

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