

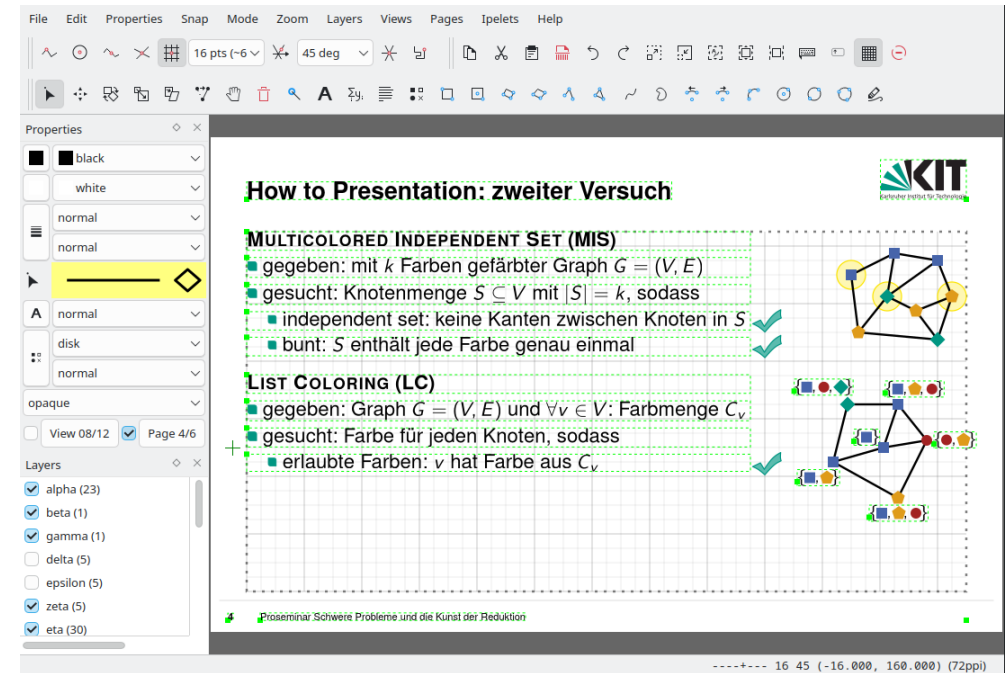
Proseminar: Schwere Probleme und die Kunst der Reduktion

IPE Einführung



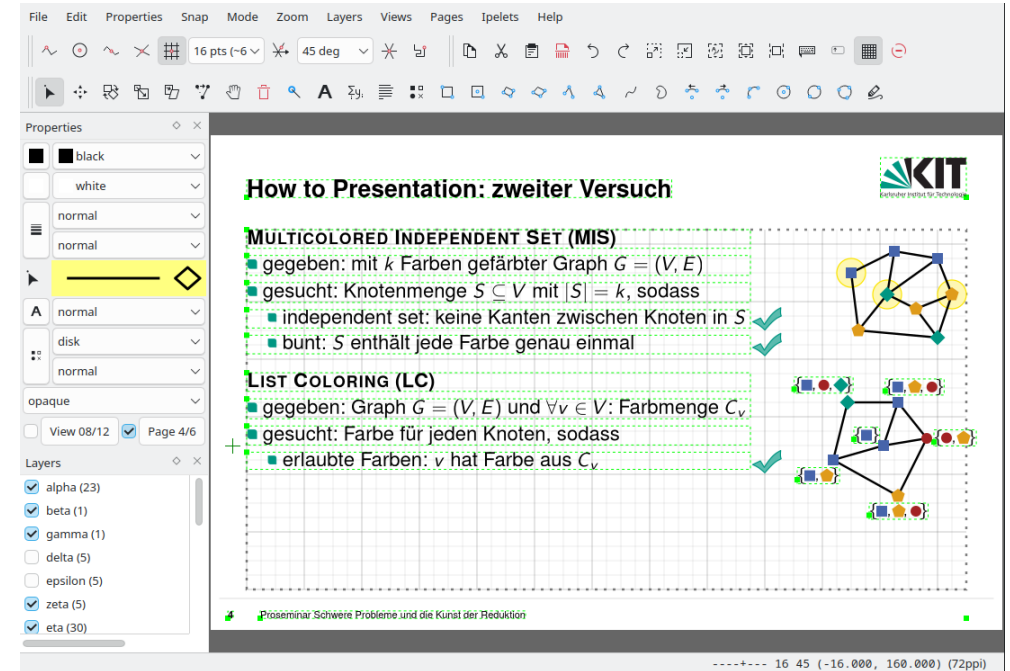
What is Ipe

- drawing tool for vector graphics
- supports $\text{\LaTeX}$
- very customizable



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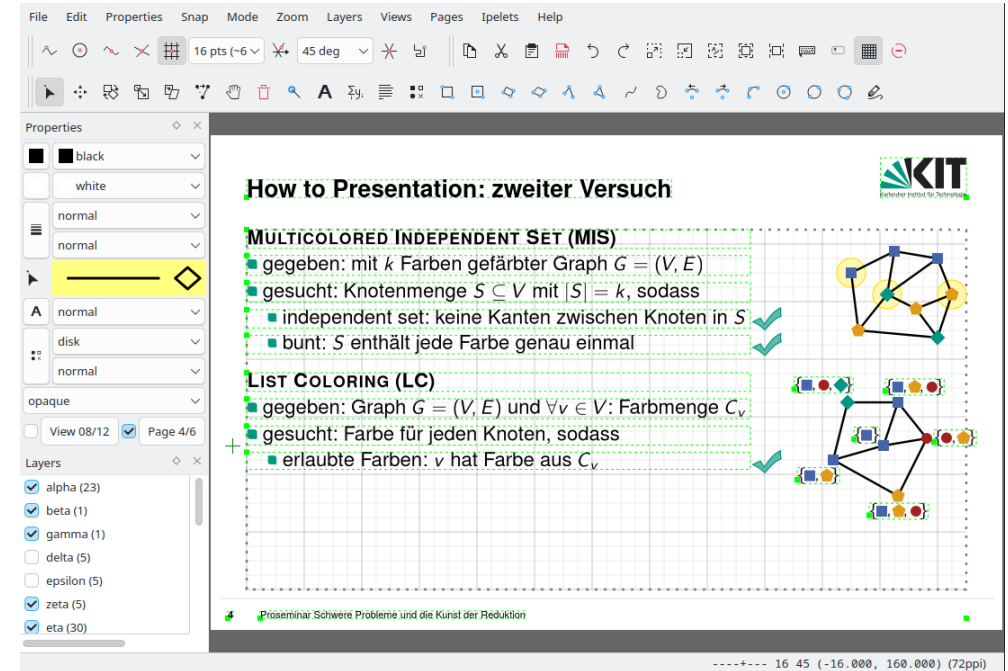
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<https://ipe.otfried.org/>

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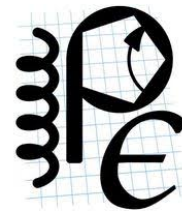


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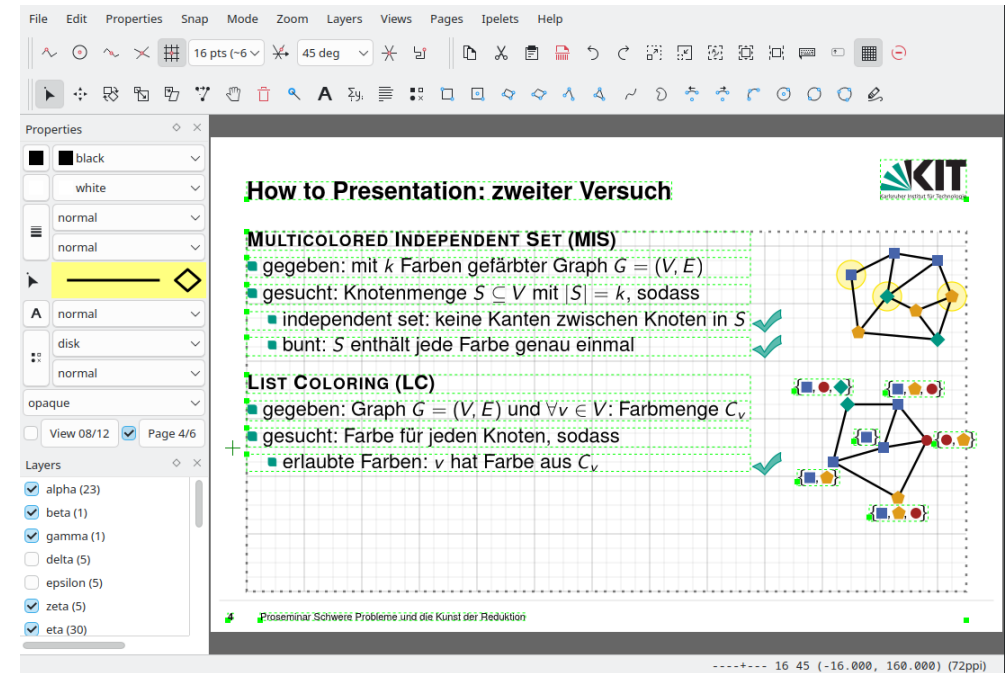
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- creating presentations



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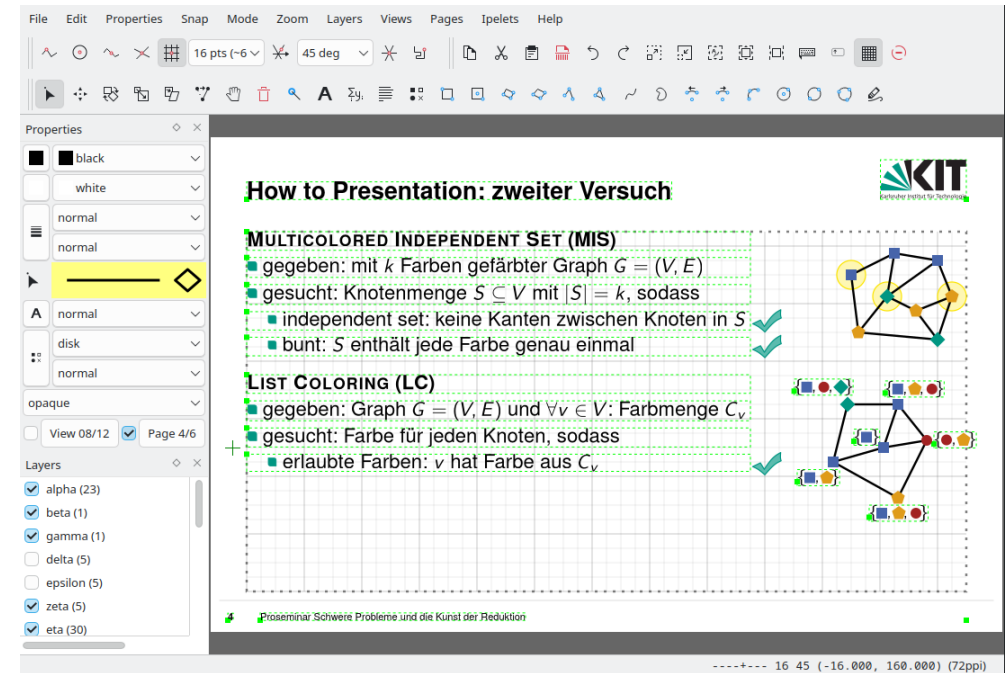


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- $\text{\LaTeX}$ + WYSIWYG illustrations
- super fast (if you learn the keyboard shortcuts)
- very flexible due to its customizability

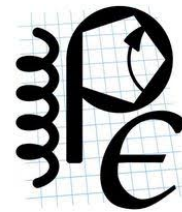


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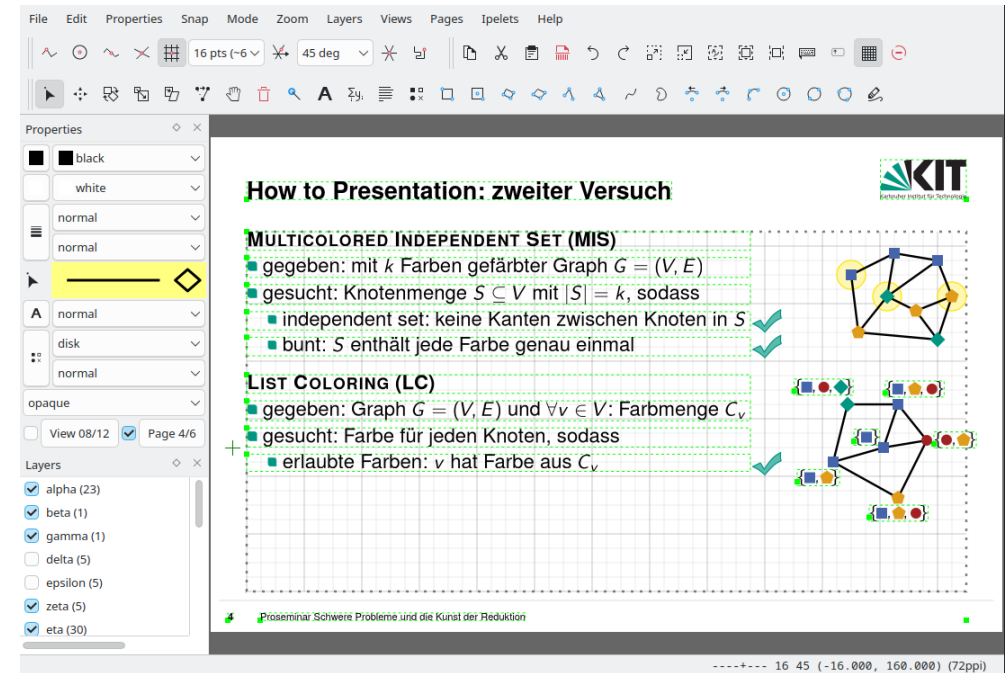


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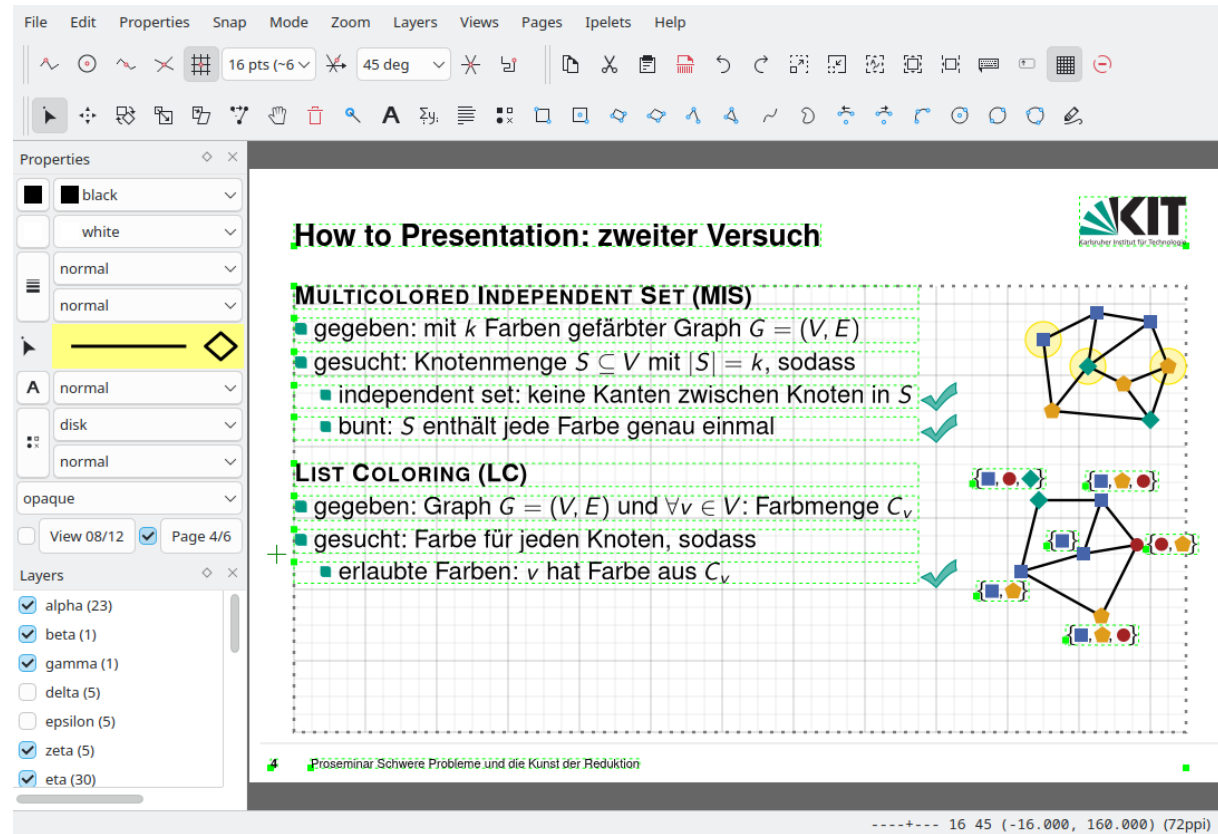


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Now: short introduction
see also: manual

Basic Usage



The screenshot shows a presentation software interface with a menu bar (File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, Help), a toolbar, and a main slide area. The slide is titled "How to Presentation: zweiter Versuch" and features the KIT logo. It contains two sections: "MULTICOLORED INDEPENDENT SET (MIS)" and "LIST COLORING (LC)".

MULTICOLORED INDEPENDENT SET (MIS)

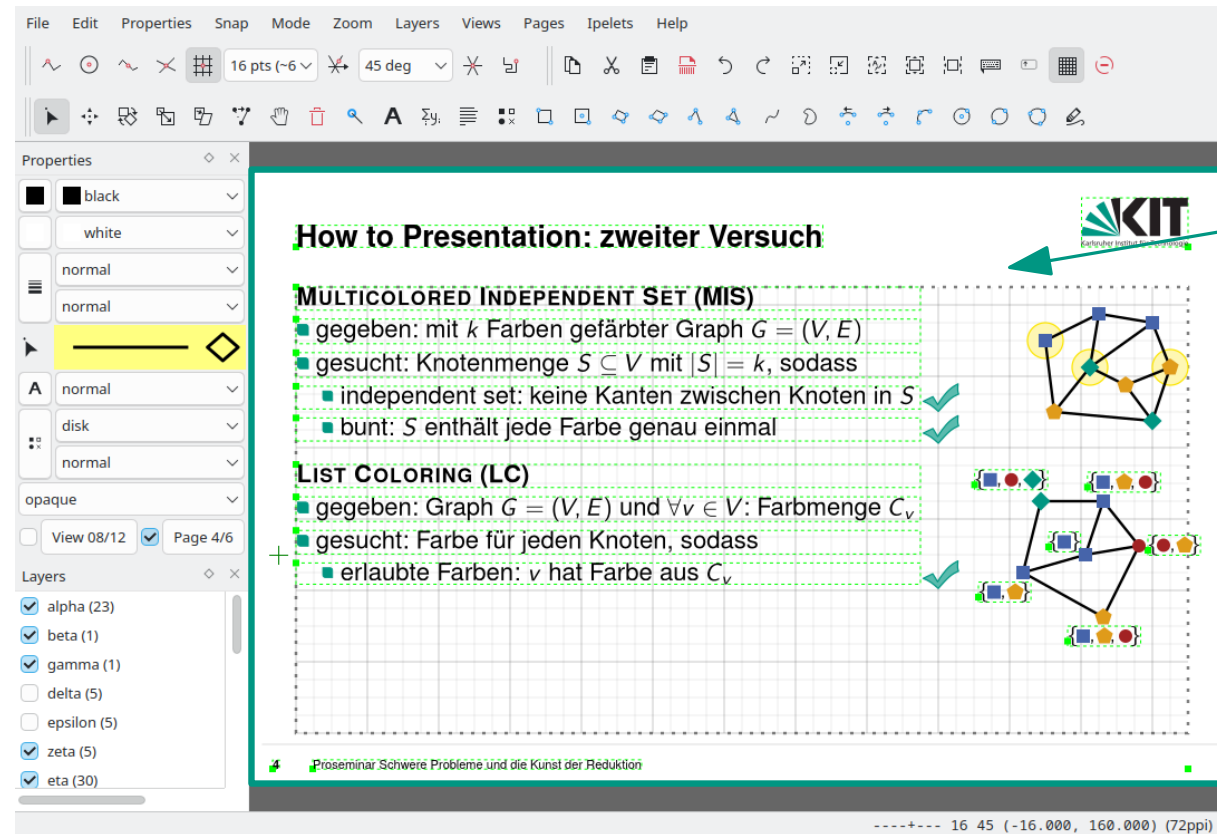
- gegeben: mit k Farben gefärbter Graph $G = (V, E)$
- gesucht: Knotenmenge $S \subseteq V$ mit $|S| = k$, sodass
 - independent set: keine Kanten zwischen Knoten in S
 - bunt: S enthält jede Farbe genau einmal

LIST COLORING (LC)

- gegeben: Graph $G = (V, E)$ und $\forall v \in V$: Farbmenge C_v
- gesucht: Farbe für jeden Knoten, sodass
 - erlaubte Farben: v hat Farbe aus C_v

The slide also includes two graph diagrams. The first diagram shows a graph with 6 nodes and 7 edges, where nodes are colored with 6 different colors (yellow, orange, green, blue, red, purple) and edges connect nodes of different colors. The second diagram shows a graph with 6 nodes and 7 edges, where nodes are colored with 6 different colors (yellow, orange, green, blue, red, purple) and edges connect nodes of different colors. The slide is part of a presentation titled "Proseminar Schwere Probleme und die Kunst der Reduktion".

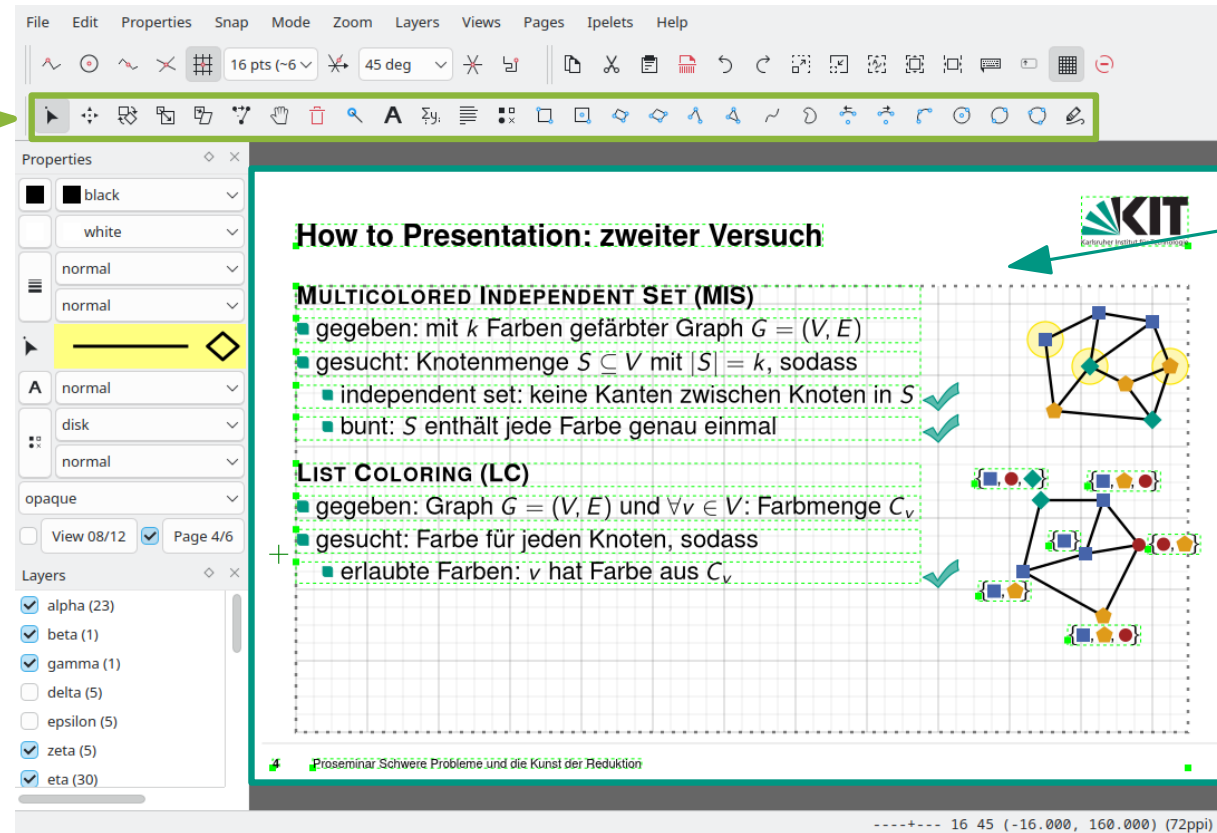
Basic Usage



content

Basic Usage

pointer modes /
tools



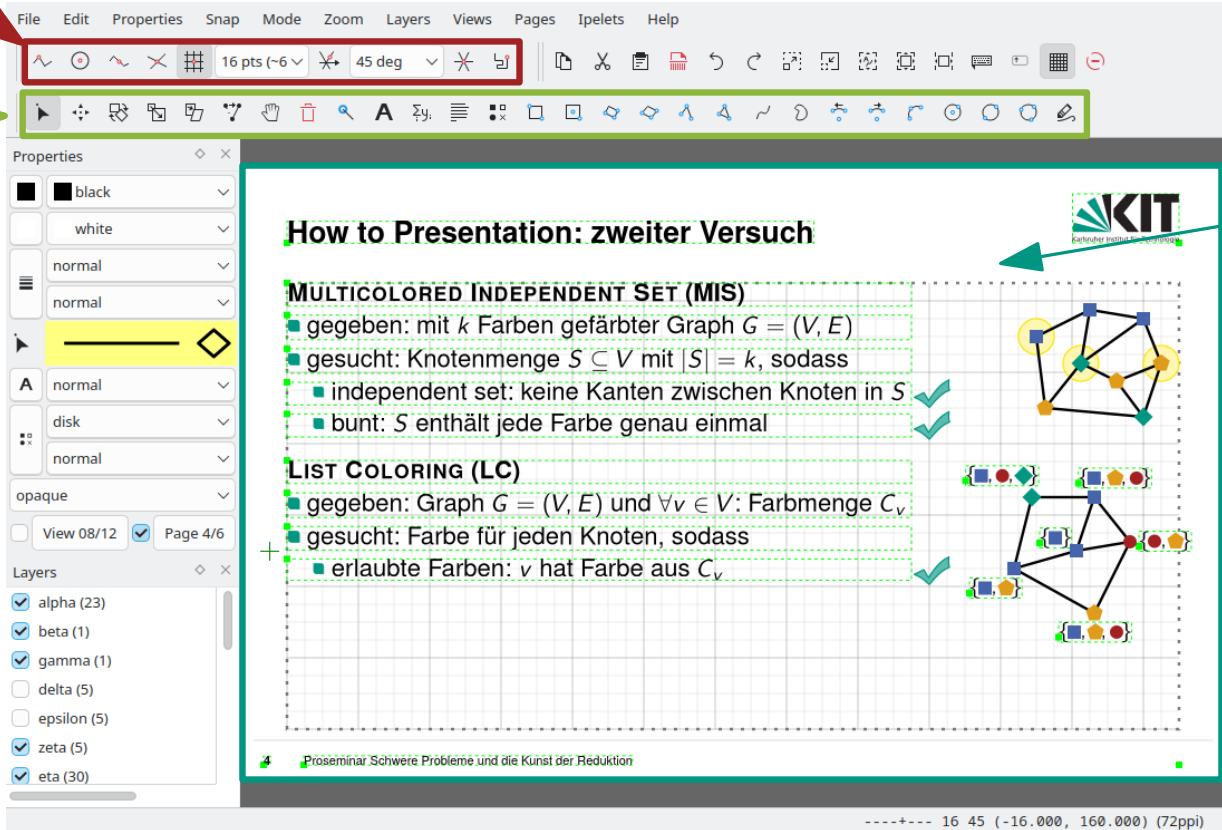
content

Basic Usage

snapping

pointer modes / tools

content



The screenshot shows the Beamer presentation editor interface. The top menu bar includes File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, and Help. Below the menu is a toolbar with various icons for drawing and editing. A red box highlights the 'Snap' and 'Mode' sections of the toolbar, with a red arrow pointing to it from the word 'snapping'. A green box highlights the 'pointer modes / tools' section of the toolbar, with a green arrow pointing to it from the text 'pointer modes / tools'. The main content area displays a slide titled 'How to Presentation: zweiter Versuch'. The slide content includes two graph coloring problems: 'MULTICOLORED INDEPENDENT SET (MIS)' and 'LIST COLORING (LC)'. The slide also features a graph diagram with nodes and edges, and a small KIT logo in the top right corner. A teal arrow points from the word 'content' to the slide content area. The left sidebar shows the 'Properties' panel with options for fill color (black, white), stroke color (normal), stroke width (normal), and stroke style (disk, normal). The 'Layers' panel shows a list of layers: alpha (23), beta (1), gamma (1), delta (5), epsilon (5), zeta (5), and eta (30). The bottom status bar shows the coordinates '----+--- 16 45 (-16.000, 160.000) (72ppi)'.

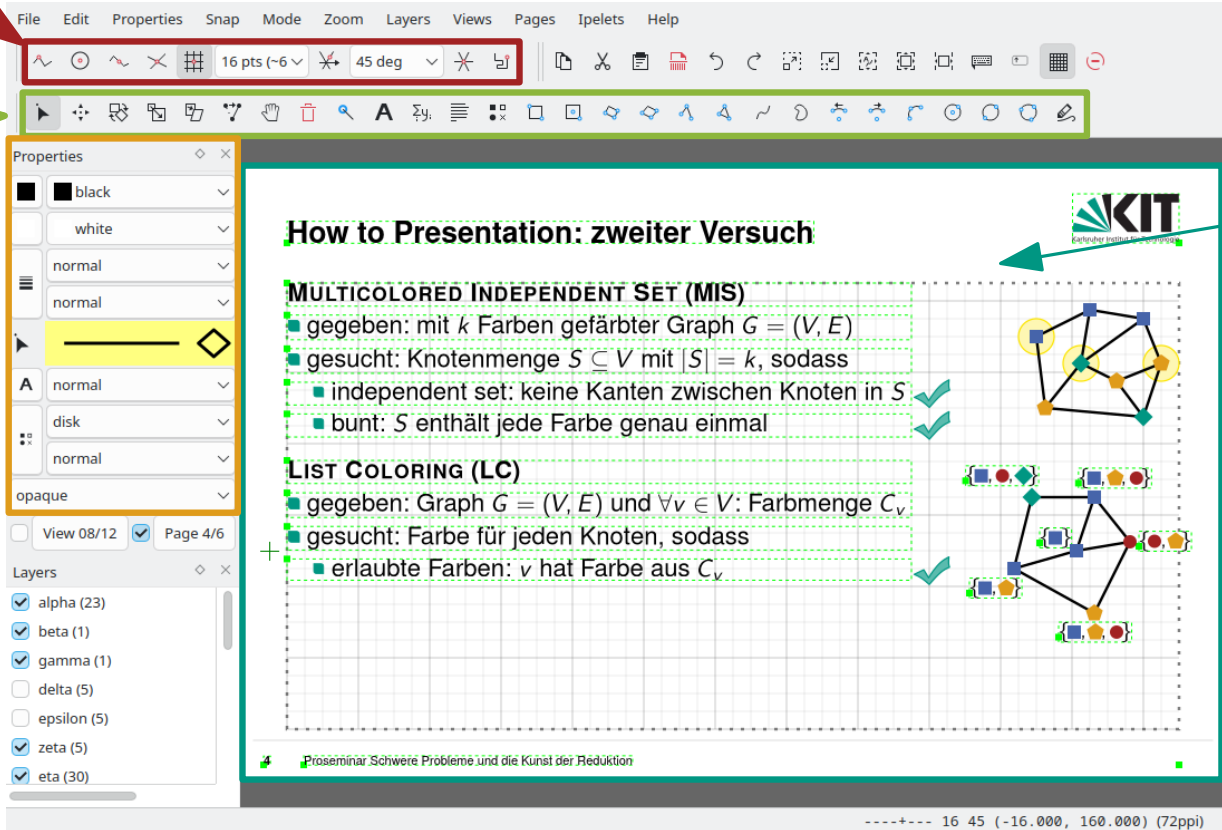
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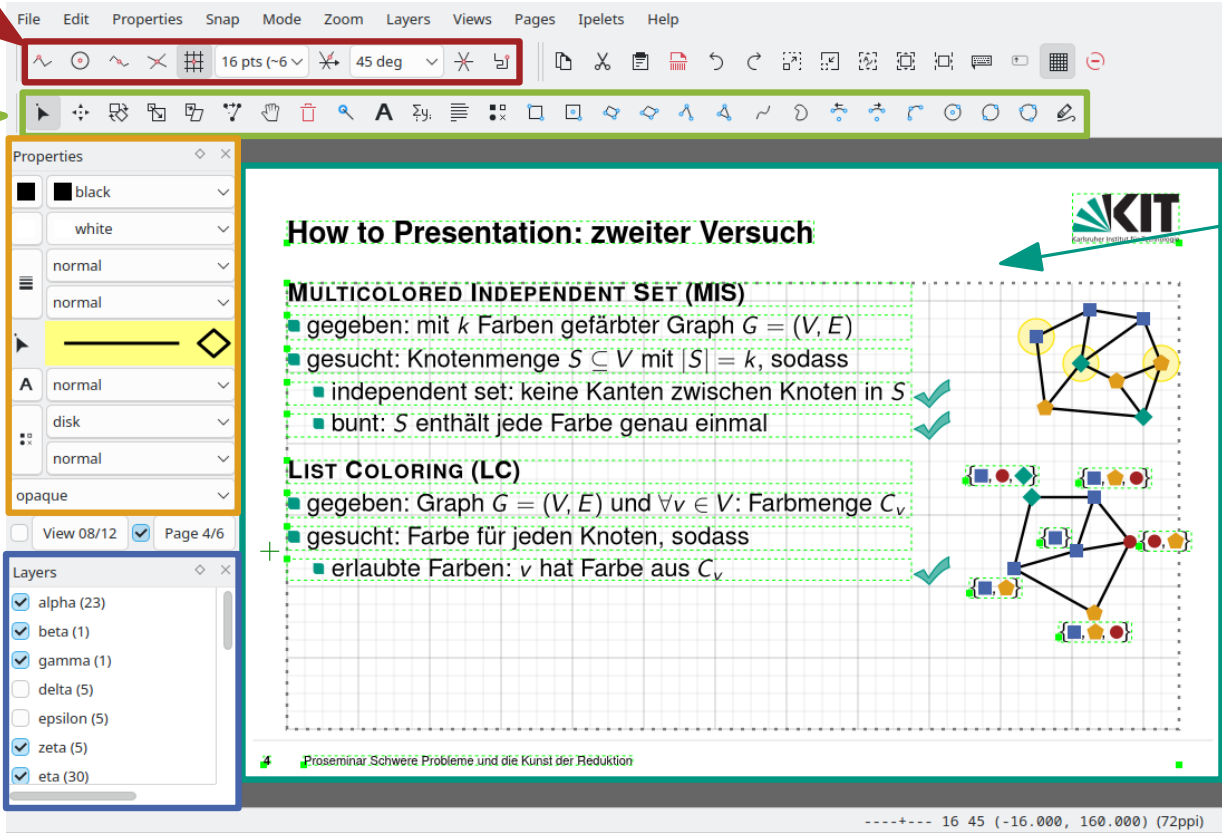
properties
also: right click on object

content



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Basic Usage

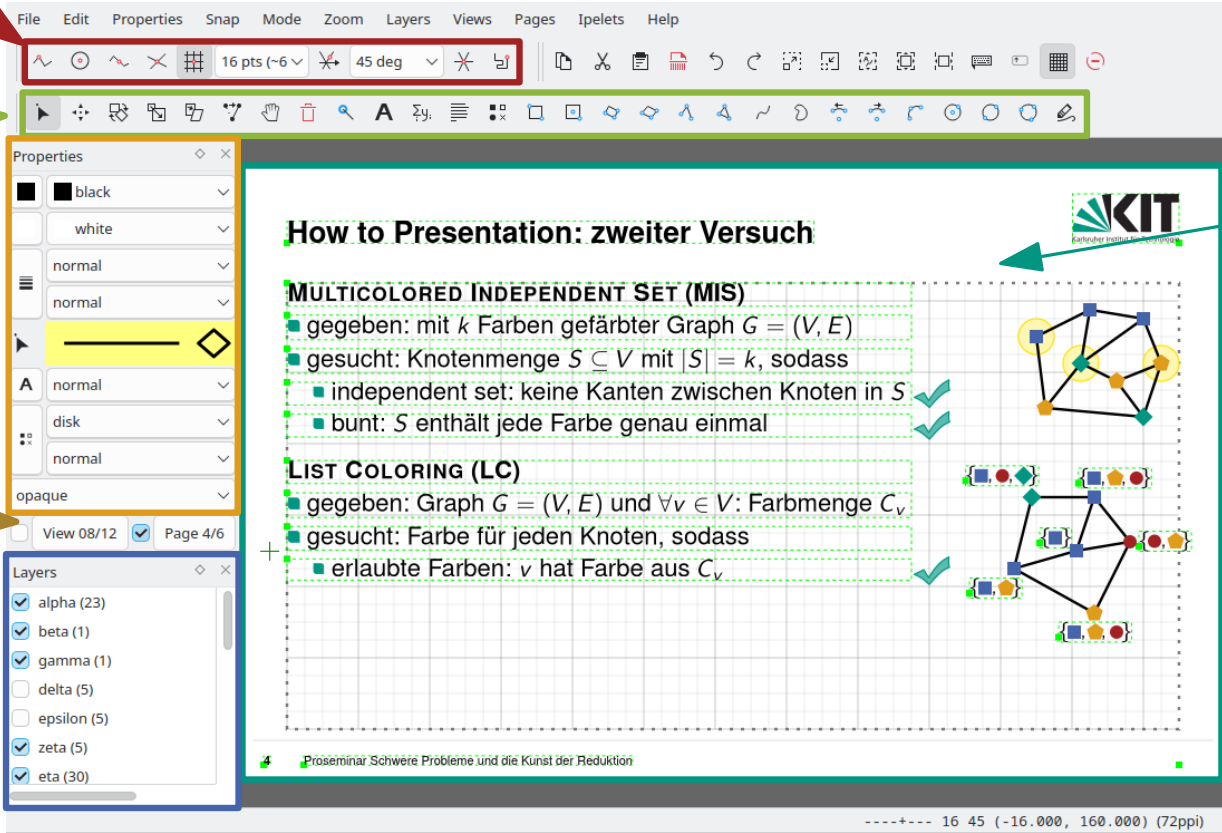


The screenshot shows the Beamer presentation editor interface. The main window displays a presentation slide titled "How to Presentation: zweiter Versuch". The slide content includes:

- MULTICOLORED INDEPENDENT SET (MIS)**
 - gegeben: mit k Farben gefärbter Graph $G = (V, E)$
 - gesucht: Knotenmenge $S \subseteq V$ mit $|S| = k$, sodass
 - independent set: keine Kanten zwischen Knoten in S
 - bunt: S enthält jede Farbe genau einmal
- LIST COLORING (LC)**
 - gegeben: Graph $G = (V, E)$ und $\forall v \in V$: Farbmenge C_v
 - gesucht: Farbe für jeden Knoten, sodass
 - erlaubte Farben: v hat Farbe aus C_v

The slide also features two graph diagrams: a top graph with nodes colored yellow, blue, and orange, and a bottom graph with nodes colored blue, red, and orange. The interface includes a menu bar (File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, Help), a toolbar with various drawing tools, a Properties panel on the left with settings for fill color, stroke, and opacity, and a Layers panel at the bottom left showing a list of layers (alpha, beta, gamma, delta, epsilon, zeta, eta) with checkboxes. Annotations with arrows point to specific parts of the interface: "snapping" points to the Snap menu item; "pointer modes / tools" points to the toolbar; "properties" (with the subtext "also: right click on object") points to the Properties panel; and "content" points to the main slide area.

Basic Usage



The screenshot shows the presentation software interface with several annotations:

- snapping**: Points to the 'Snap' menu item in the top toolbar.
- pointer modes / tools**: Points to the 'Tools' menu item in the top toolbar.
- properties**: Points to the 'Properties' panel on the left, which includes options for color, font, and style. A sub-note says 'also: right click on object'.
- views**: Points to the 'Views' panel at the bottom left, showing a list of views (alpha, beta, gamma, delta, epsilon, zeta, eta) with checkboxes.
- layers**: Points to the 'Layers' panel at the bottom left, showing a list of layers (alpha, beta, gamma, delta, epsilon, zeta, eta) with checkboxes.
- content**: Points to the main presentation area, which contains text and diagrams.

The main presentation area displays the following content:

How to Presentation: zweiter Versuch

MULTICOLORED INDEPENDENT SET (MIS)

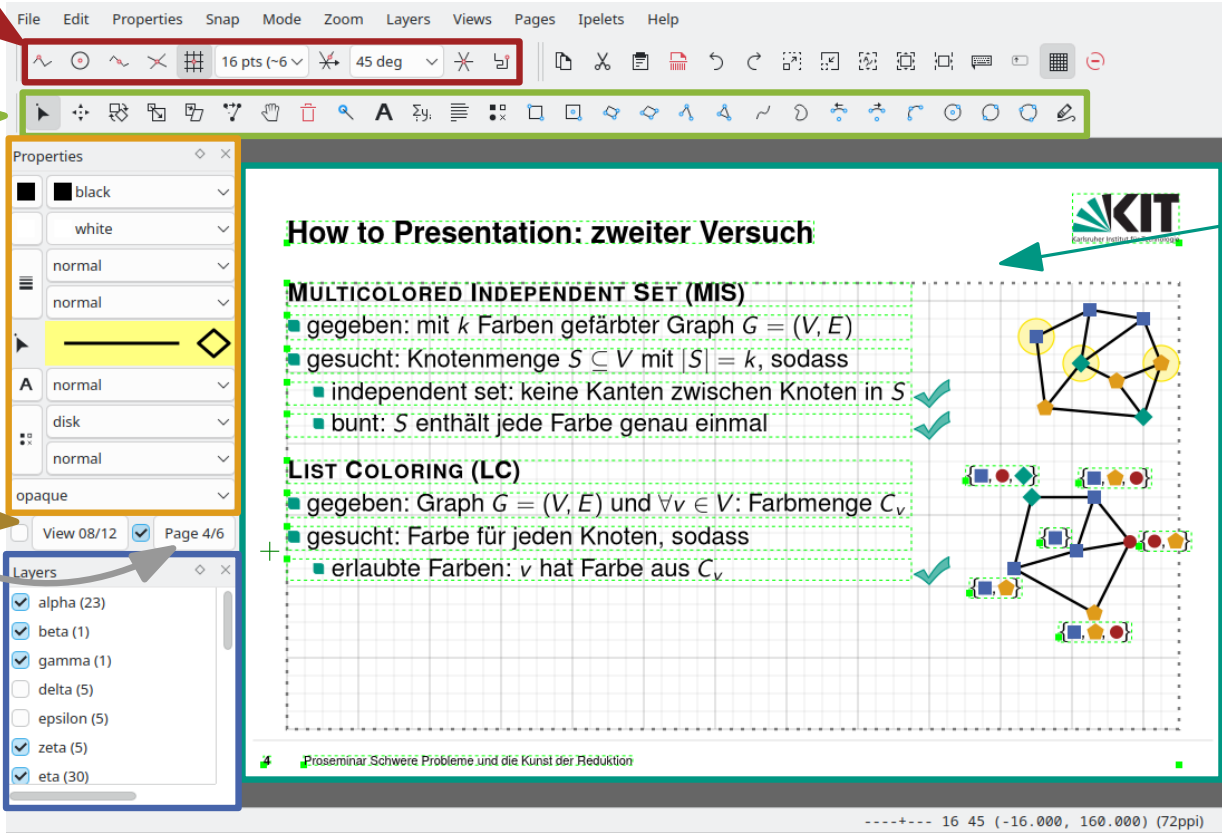
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The diagrams show two graphs. The first graph has nodes colored with different colors (yellow, orange, green, blue, red) and edges. The second graph has nodes colored with different colors (blue, orange, green, red) and edges. The text 'Proseminar Schwere Probleme und die Kunst der Reduktion' is visible at the bottom of the presentation area.

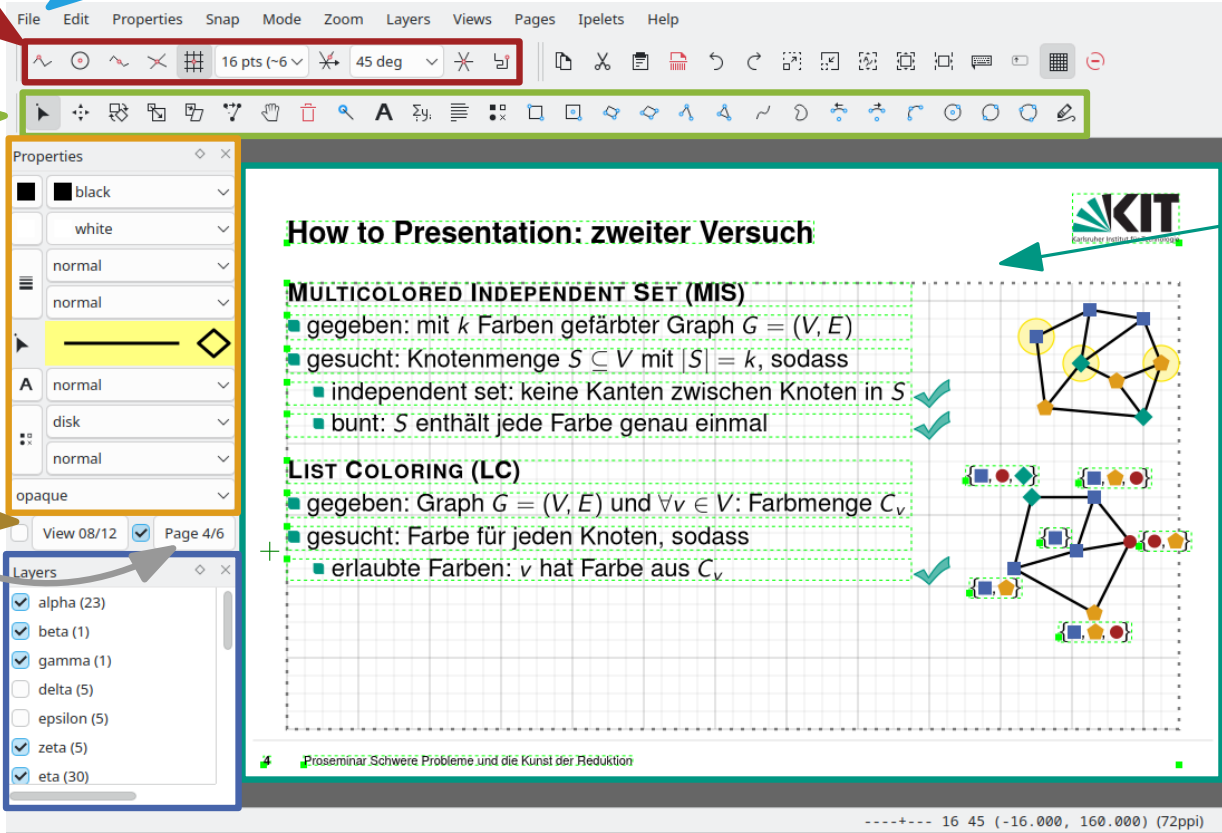
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- properties**: Points to the 'Properties' panel on the left, which includes options for color, font, and style. A sub-note says 'also: right click on object'.
- views**: Points to the 'Views' menu item in the top toolbar.
- pages**: Points to the 'Pages' menu item in the top toolbar.
- layers**: Points to the 'Layers' panel on the left, which lists various layers like alpha, beta, gamma, etc.
- content**: Points to the main presentation area, which displays a slide titled 'How to Presentation: zweiter Versuch' with text and diagrams.

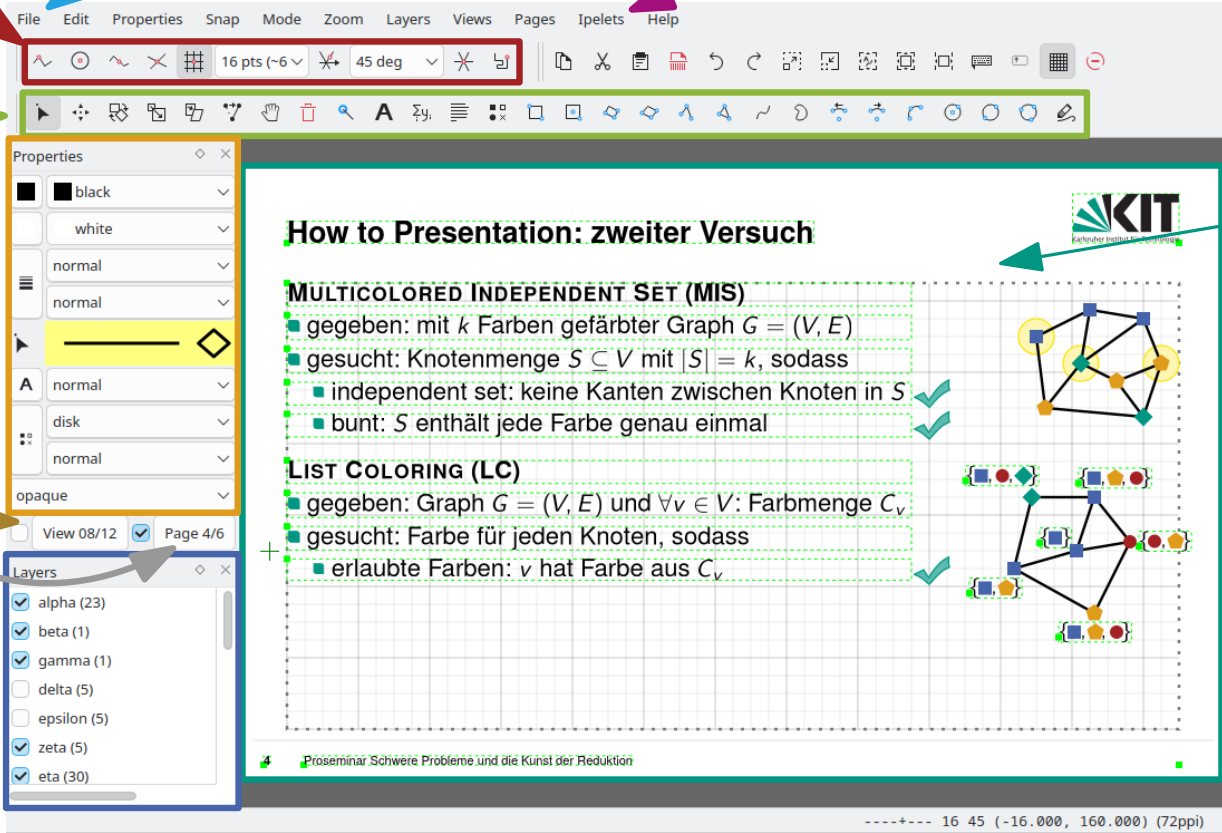
Basic Usage



The screenshot shows the presentation software interface with several annotations:

- snapping**: Points to the 'Snap' menu item in the top toolbar.
- save as pdf**: Points to the 'File' menu item in the top toolbar.
- pointer modes / tools**: Points to the 'Edit' menu item in the top toolbar.
- properties**: Points to the 'Properties' panel on the left, which includes options for color (black, white), font (normal), size (16 pts), and other settings. A sub-note says 'also: right click on object'.
- views**: Points to the 'Views' menu item in the top toolbar.
- pages**: Points to the 'Pages' menu item in the top toolbar.
- layers**: Points to the 'Layers' panel on the left, which lists layers like alpha (23), beta (1), gamma (1), delta (5), epsilon (5), zeta (5), and eta (30).
- content**: Points to the main presentation area, which displays a slide titled 'How to Presentation: zweiter Versuch' with text about 'MULTICOLORED INDEPENDENT SET (MIS)' and 'LIST COLORING (LC)', along with a graph diagram.

Basic Usage



The screenshot shows the Ipe presentation software interface. The menu bar at the top includes File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, and Help. The toolbar below the menu contains various drawing and editing tools. The main canvas displays a presentation slide titled "How to Presentation: zweiter Versuch" with a KIT logo in the top right corner. The slide content includes two sections: "MULTICOLORED INDEPENDENT SET (MIS)" and "LIST COLORING (LC)". The MIS section describes a problem involving a graph $G = (V, E)$ with k colors and a sought independent set $S \subseteq V$ of size k . The LC section describes a problem involving a graph $G = (V, E)$ and a sought coloring for each node $v \in V$ from a set C_v . The interface also features a Properties panel on the left with options for fill color, stroke color, line style, font, and opacity. A Layers panel at the bottom left lists various layers like alpha, beta, gamma, delta, epsilon, zeta, and eta. Arrows from the text labels point to these specific interface elements.

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ipelets

pointer modes / tools

properties
also: right click on object

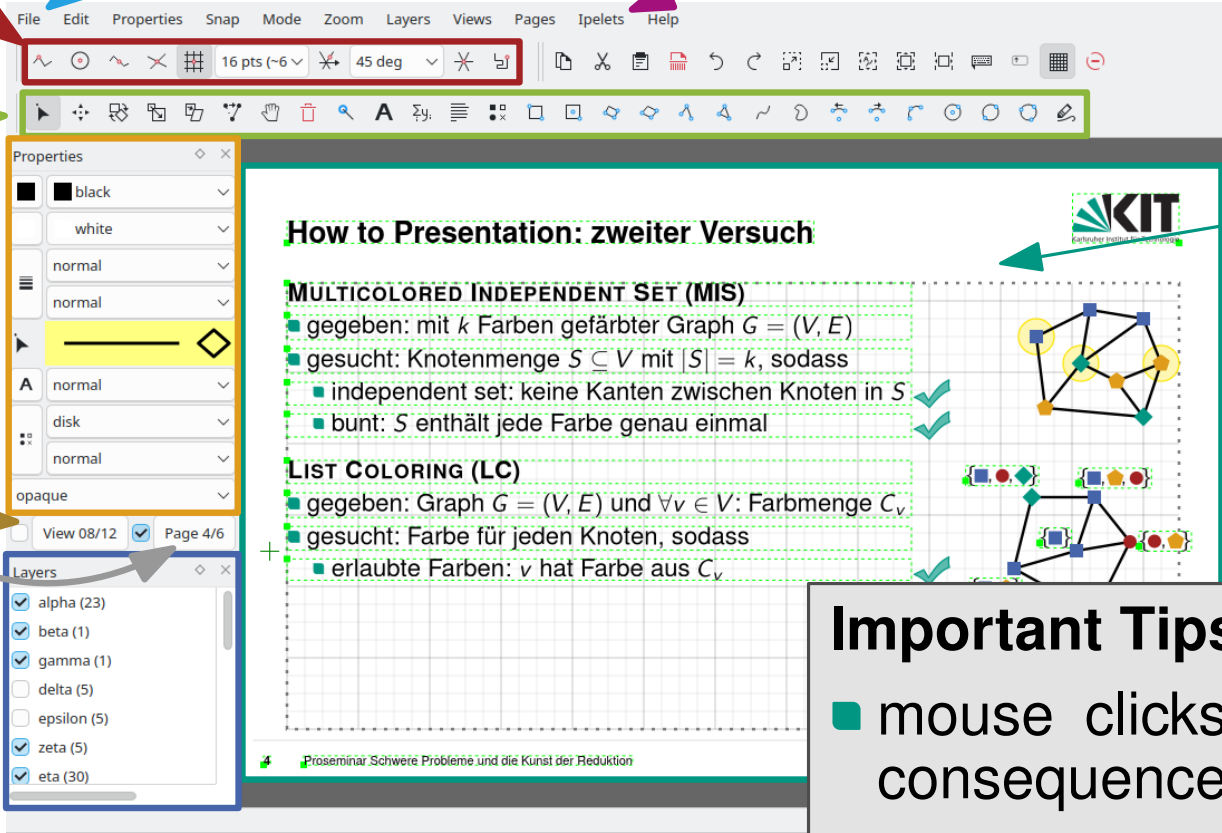
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Important Tips

- mouse clicks usually have consequences
- learn and use shortcuts

Basic Usage

Basic Tools

- paths: p, P, b
- curves: i, l
- circles: o, a
- marks: m
- **labels: ℓ , g**
- **select: s**
- translate: t
- rotate: r
- scale: e

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- mouse wheel (pan + zoom)
- x, =, \

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Z-Order

- ctrl + f
- ctrl + b
- ctrl + shift + b
- ctrl + shift + f

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- ctrl + shift + p

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Snapping

Document properties

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Mouse shortcuts

- ctrl [+ shift] + lclick: select
- ctrl [+ shift] + rclick: scale
- **alt + lclick: translate**
- alt + rclick: rotate

Page Title

- ctrl + p

Making Presentations: Layers, Views, Pages

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- every object lives on one layer
- layers can be hidden/shown independently

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Pages

- independent pages with their own set of layers and views
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- copy, paste, cut page: ctrl + shift + c/v/x
- navigating pages: Shift + PgUp / PgDown

Customization: Style Sheets & Ipelets

Style sheets

- xml-file describing document features
- available colors, line thickness, arrow shapes, page size, etc.
- ctrl + shift + s

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- folder: .ipe/ipelets (see Help → Show config.)
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Put into ~/.ipe/ipelets/custom.lua

```
function IpeletByName(name)
    for _, ipelet in pairs(_G.ipelets) do
        if ipelet.name == name then
            return(ipelet)
        end
    end
end

IpeletByName("align").skip = 8.0
-- shortcuts to align top to bottom and set
  skip
shortcuts.ipelet_14_align = "Alt+Shift+T"
shortcuts.ipelet_19_align = "Alt+Shift+S"
```

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- goodies
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See also: <https://github.com/thobl/ipelets>

- hide
- offset
- decorator

Advanced Usage

Groups

- group and ungroup: ctrl + G, ctrl + U
- be careful: objects are placed on active layer

Advanced Usage

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Combining paths

- compose $((A \cup B) \setminus (A \cap B))$, join
- clipping $(A \cap B)$: select group + object, “Add clipping path” (right click)

Advanced Usage

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- be careful: objects are placed on active layer

Combining paths

- compose $((A \cup B) \setminus (A \cap B))$, join
- clipping $(A \cap B)$: select group + object, “Add clipping path” (right click)

Transparency

Advanced Usage

Groups

- group and ungroup: ctrl + G, ctrl + U
- be careful: objects are placed on active layer

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Transparency

Edit as xml

Advanced Usage

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Transparency

Edit as xml

Presentation template

Advanced Usage

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Transparency

Edit as xml

Presentation template

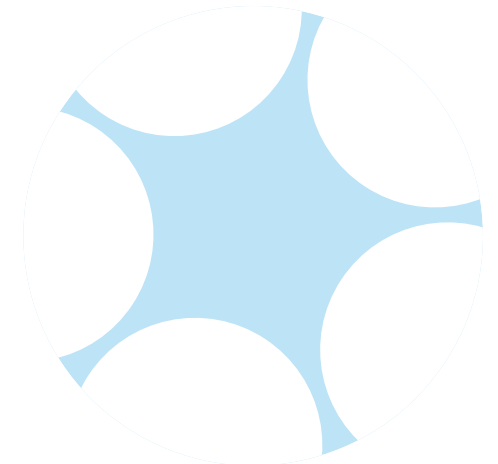
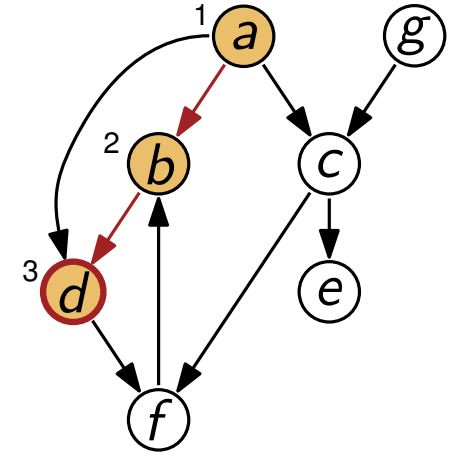
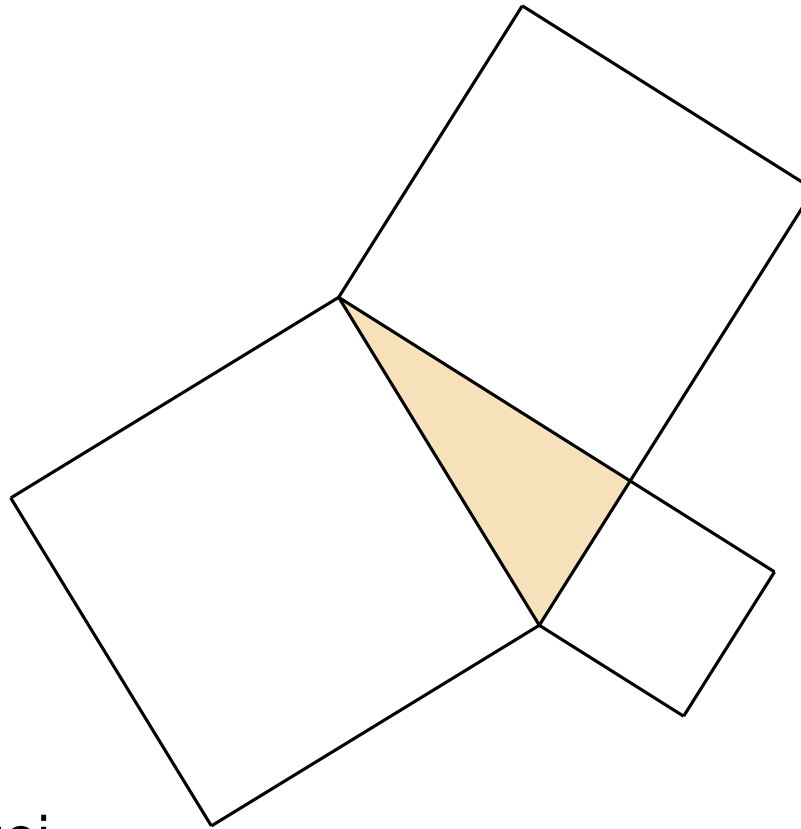
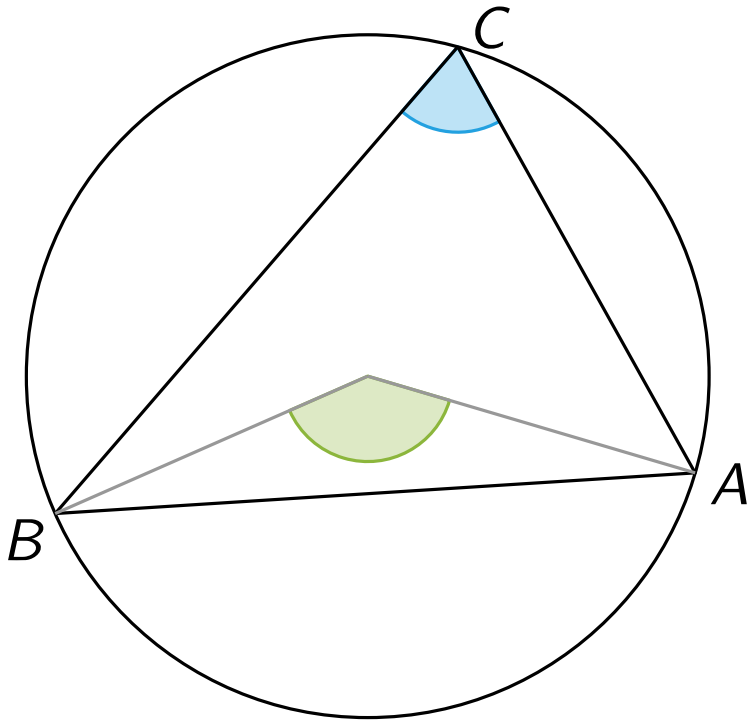
Angular snapping / Coordinate Origin

- used for scaling and rotations
- F1: set origin of coordinate system
- ctrl + F1: unset coordinate system

Vorschläge zum Üben

Tutorial zum Durcharbeiten:

https://i11www.iti.kit.edu/information/ipe_tutorial



Also helpful:

Youtube-Playlist by Václav Blažej