

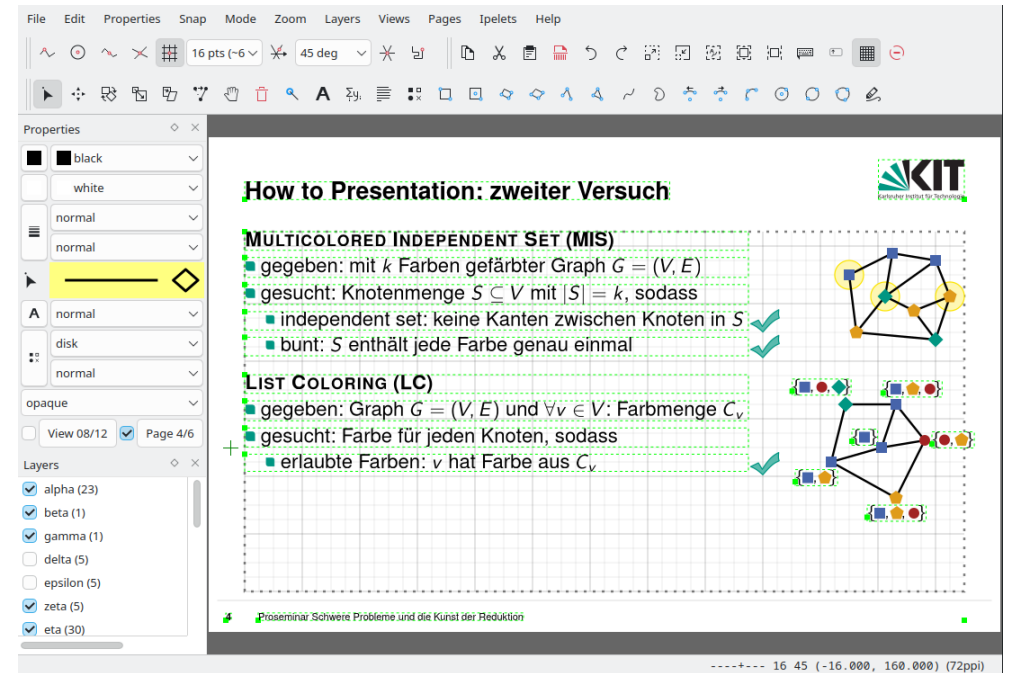
Proseminar: Schwere Probleme und die Kunst der Reduktion

IPE Einführung



What is Ipe

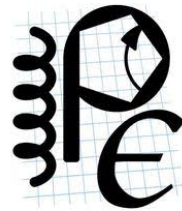
- drawing tool for vector graphics
- supports $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$
- very customizable



IPE

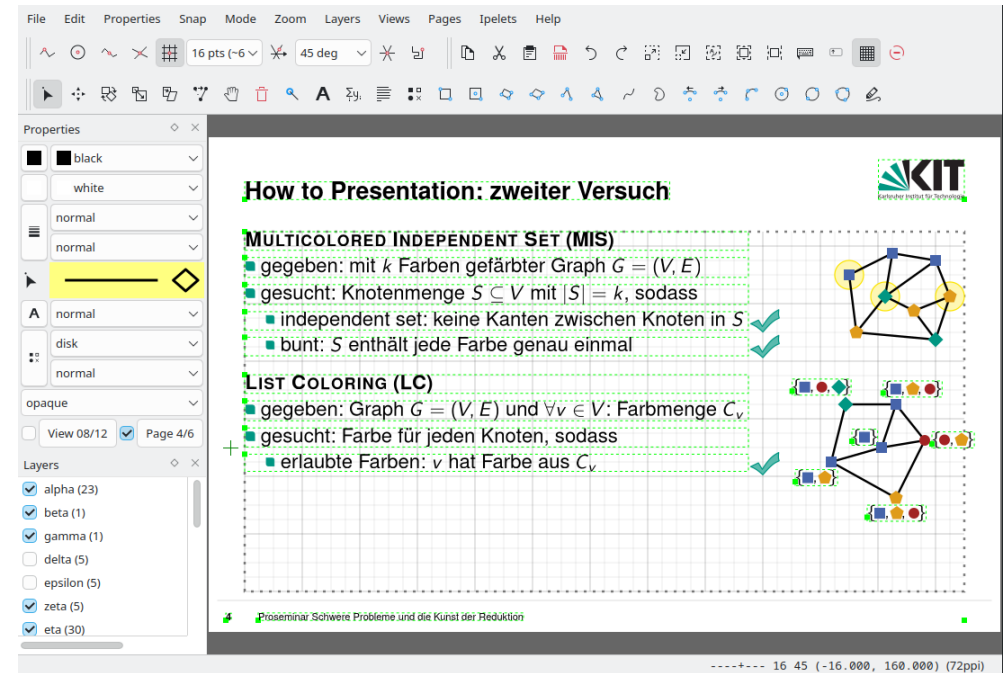
What is Ipe

- drawing tool for vector graphics
- supports \LaTeX
- very customizable



What can I use it for?

- creating illustrations for seminar essays, theses, or papers
- creating presentations



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



IPE

What is Ipe

- drawing tool for vector graphics
- supports \LaTeX
- very customizable

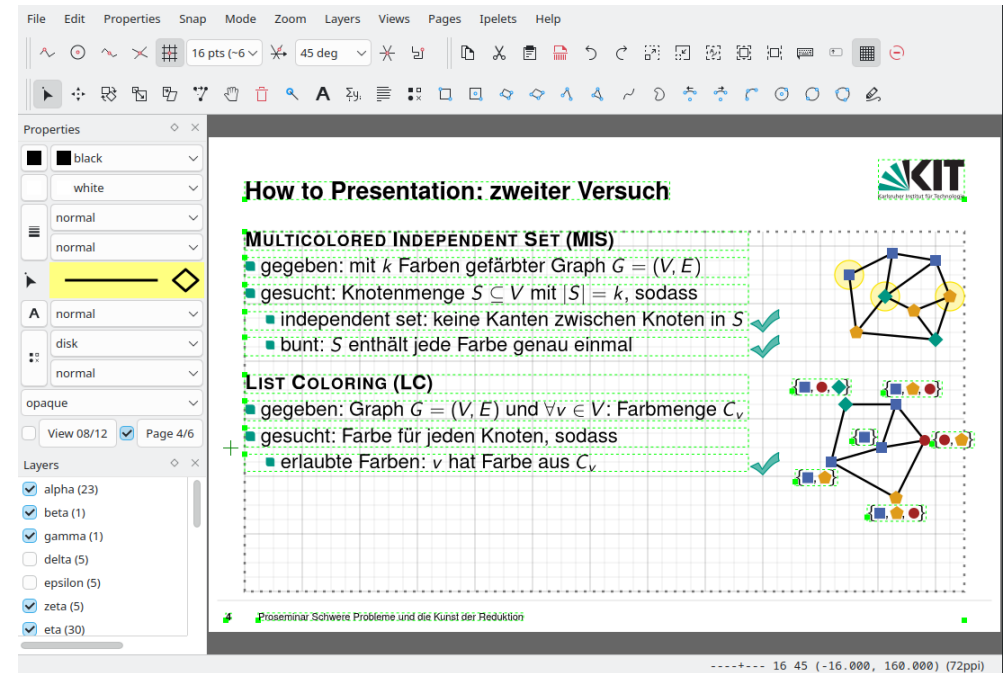


What can I use it for?

- creating illustrations for seminar essays, theses, or papers
- creating presentations

Why should I use it?

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



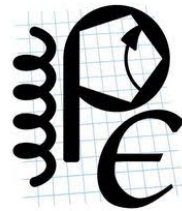
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IPE

What is Ipe

- drawing tool for vector graphics
- supports \LaTeX
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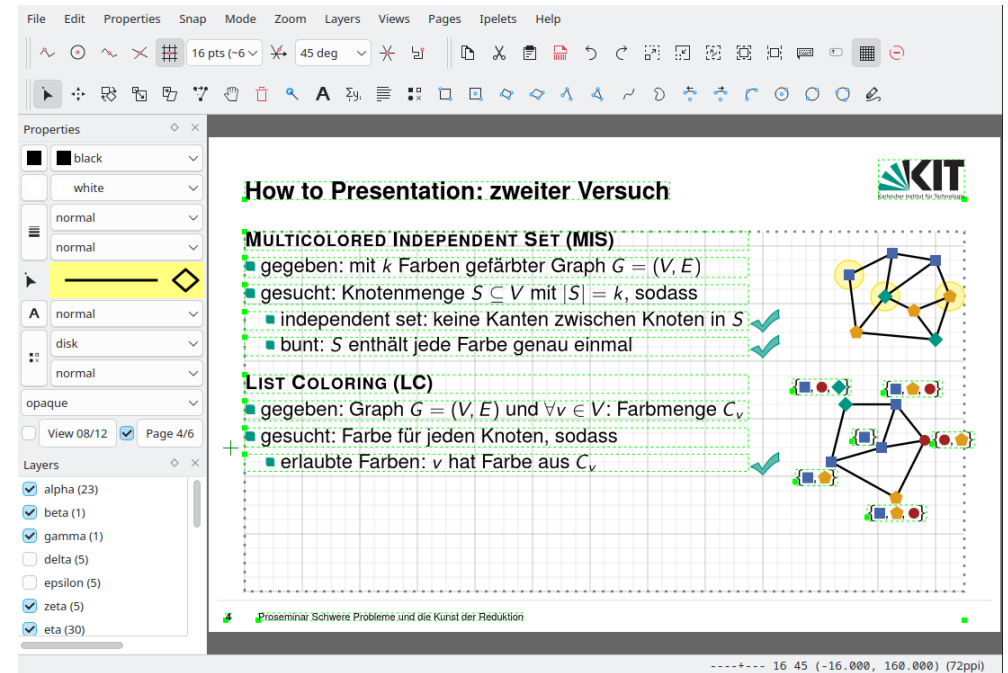


What can I use it for?

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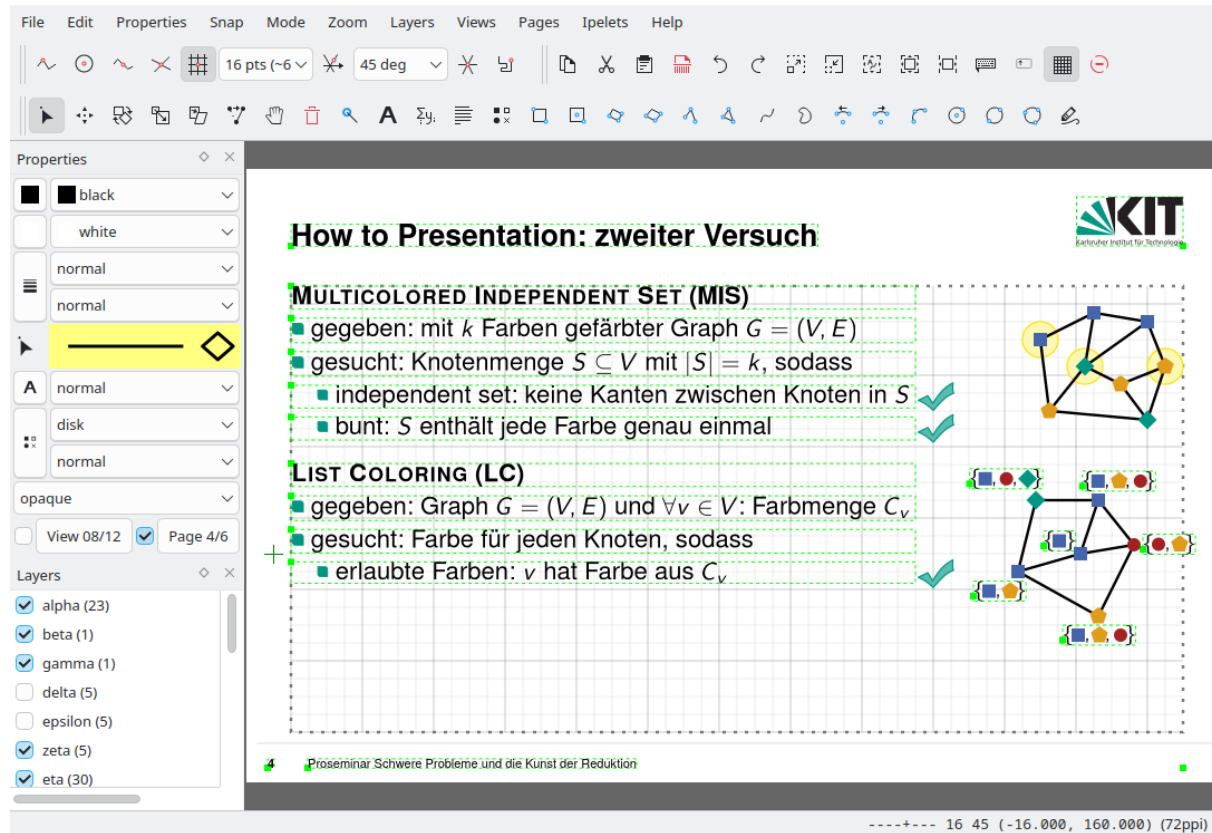


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Now: short introduction
see also: manual

Basic Usage



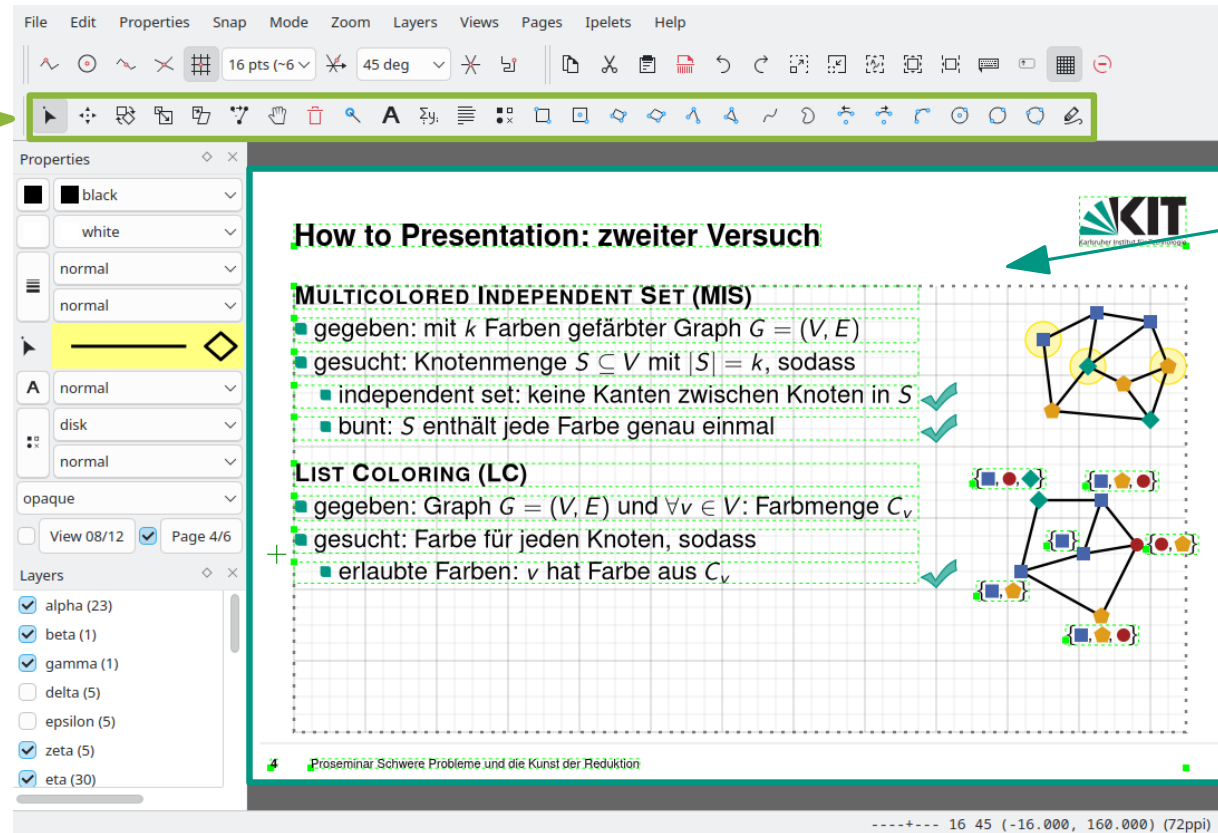
The screenshot shows a Beamer presentation slide with the following content:

- How to Presentation: zweiter Versuch**
- MULTICOLORED INDEPENDENT SET (MIS)**
 - gegeben: mit k Farben gefärbter Graph $G = (V, E)$
 - gesucht: Knotenmenge $S \subset V$ 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 includes two diagrams: a graph with nodes colored yellow, blue, and orange, and a graph with nodes colored blue, red, and orange, with associated color sets C_v shown next to them. The Beamer interface shows the Properties panel on the left and the Layers panel at the bottom left.

Basic Usage

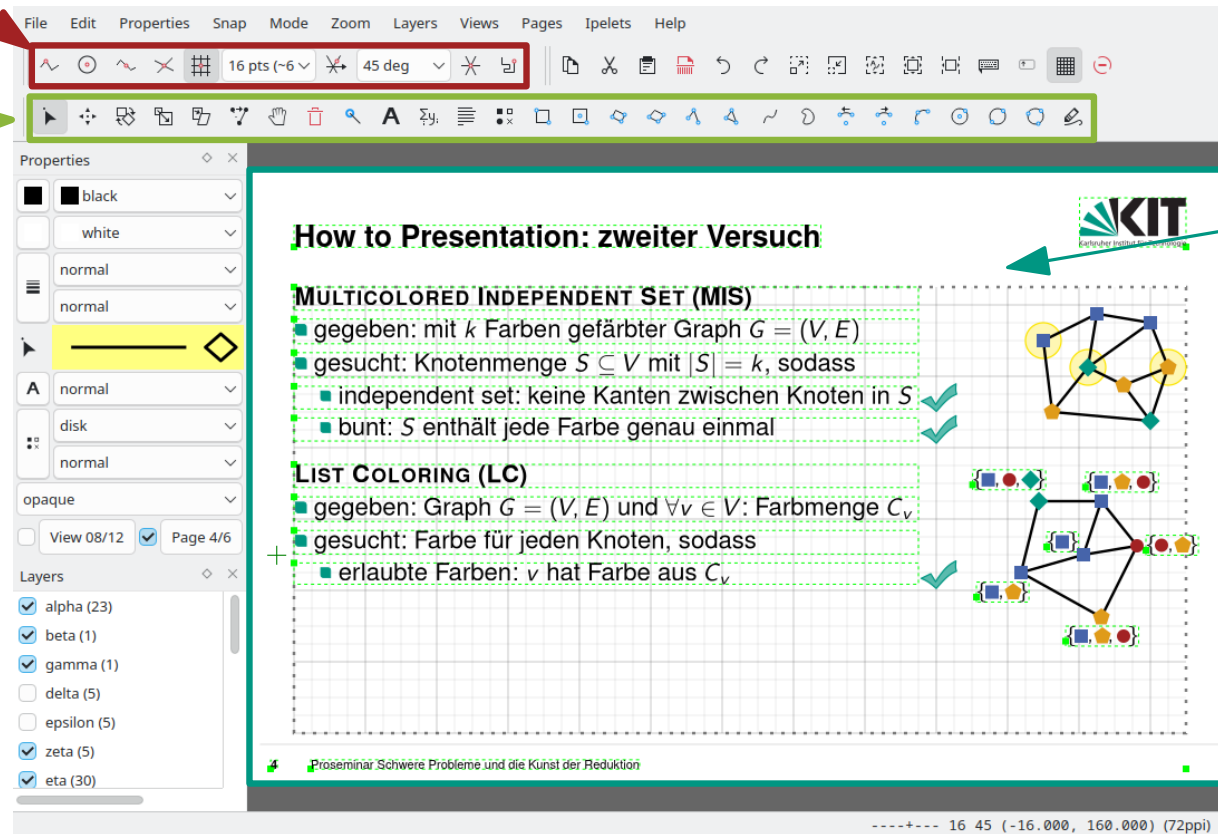
pointer modes /
tools



content

Basic Usage

snapping
pointer modes / tools



The screenshot shows the Beamer presentation software 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 navigation and editing. A red box highlights the 'Snap' and 'Mode' sections of the toolbar, which include a grid icon, a line icon, and a dropdown menu showing '16 pts (~6)' and '45 deg'. A green box highlights the 'pointer modes / tools' section of the toolbar, which includes a selection tool, a lasso tool, a hand tool, a zoom tool, a pan tool, a copy tool, a paste tool, a delete tool, a search tool, a text tool, a line tool, a rectangle tool, a circle tool, an ellipse tool, a curve tool, a brush tool, an eraser tool, and a fill tool. The main content area displays a slide titled 'How to Presentation: zweiter Versuch'. The slide content includes the KIT logo, the title 'How to Presentation: zweiter Versuch', and two sections: 'MULTICOLORED INDEPENDENT SET (MIS)' and 'LIST COLORING (LC)'. The 'MIS' section defines a graph $G = (V, E)$ with k colors and asks for a set $S \subset V$ of size k that is independent and contains exactly one node of each color. The 'LC' section defines a graph $G = (V, E)$ and a set of allowed colors C_v for each node v , and asks for a coloring where each node's color is in its allowed set. Two graphs are shown on the right side of the slide, one with nodes colored by MIS and one with nodes colored by LC. The bottom status bar shows 'Proseminar Schwere Probleme und die Kunst der Reduktion' and '----+--- 16 45 (-16.000, 160.000) (72ppi)'. Red and green arrows point from the text 'snapping' and 'pointer modes / tools' to the corresponding toolbar sections. A green arrow points from the text 'content' to the slide content area.

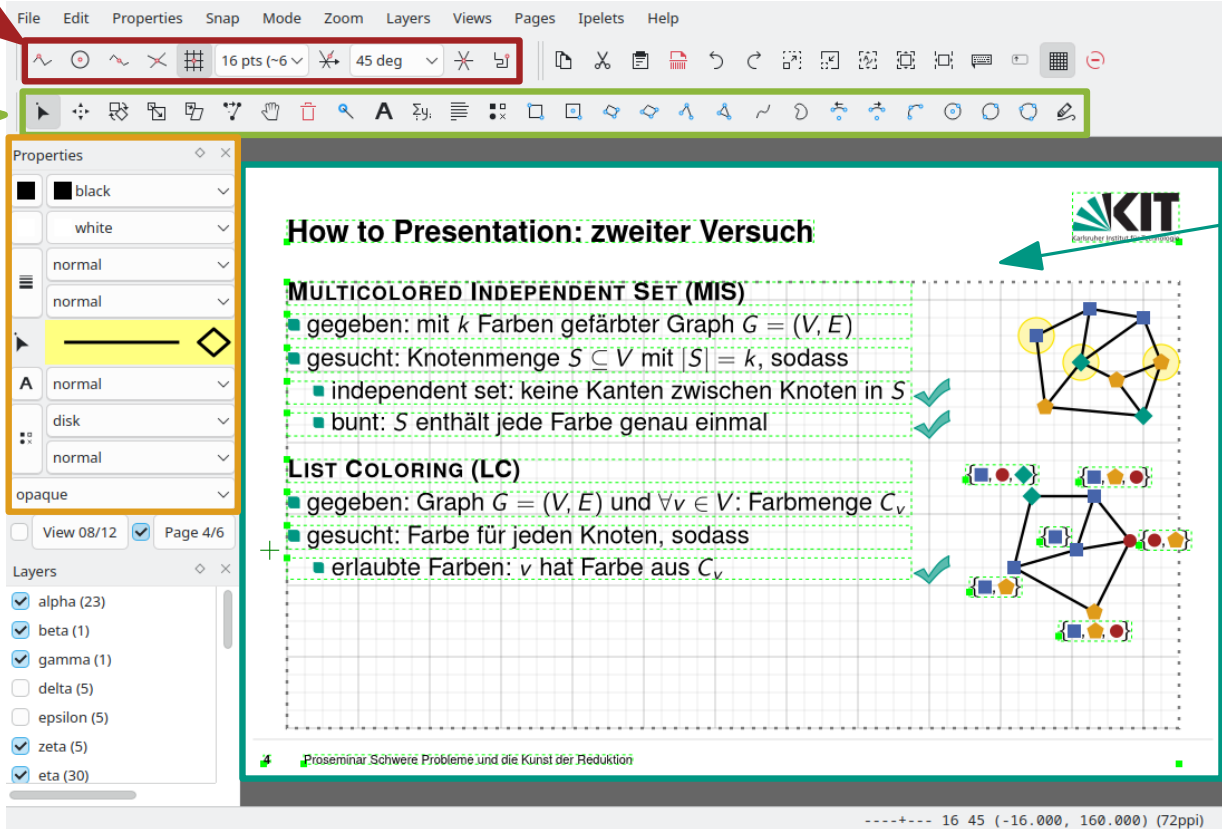
Basic Usage

snapping

pointer modes / tools

properties
also: right click on object

content



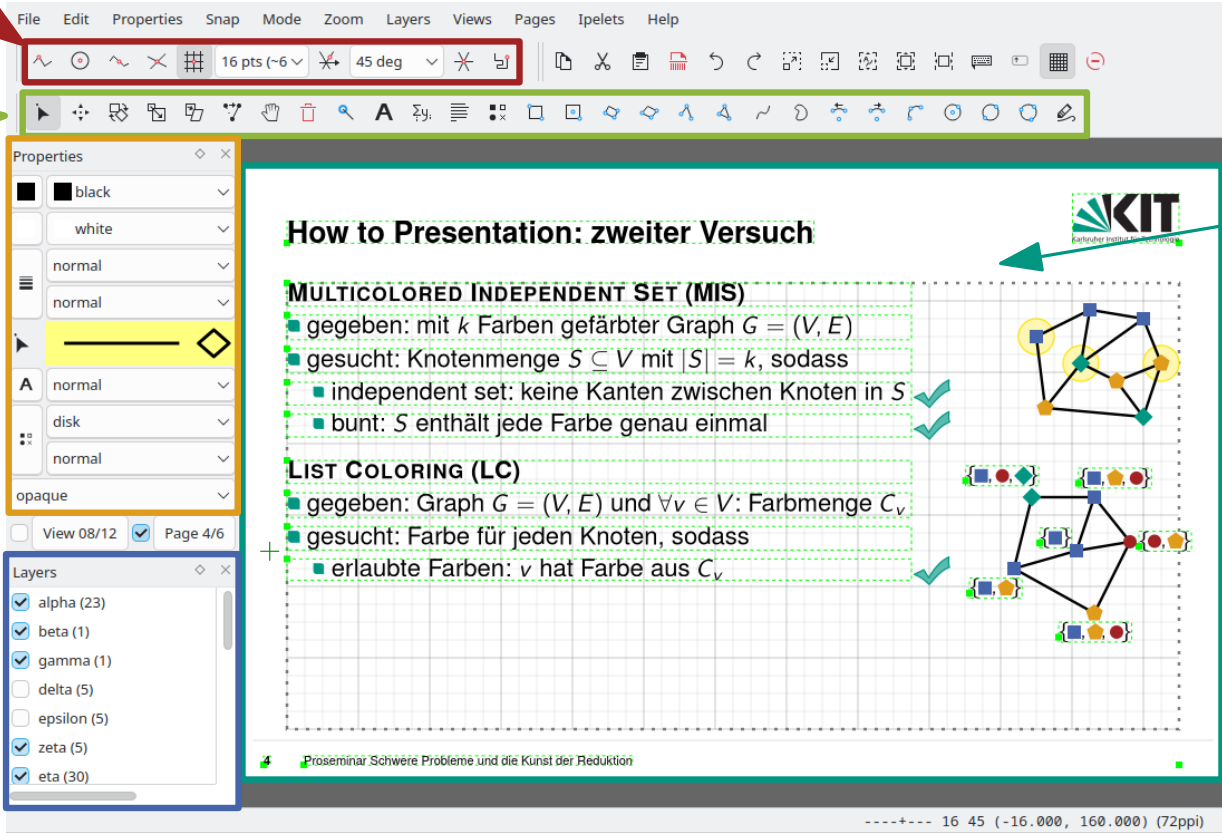
The screenshot shows a Beamer presentation editor window. The main content area displays a slide titled "How to Presentation: zweiter Versuch" with a KIT logo in the top right. The slide content includes:

- MULTICOLORED INDEPENDENT SET (MIS)**
 - gegeben: mit k Farben gefärbter Graph $G = (V, E)$
 - gesucht: Knotenmenge $S \subset V$ mit $|S| = k$, sodass
 - independent set: keine Kanten zwischen Knoten in S
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 - gesucht: Farbe für jeden Knoten, sodass
 - erlaubte Farben: v hat Farbe aus C_v

Two graph diagrams are shown on the right side of the slide. The top diagram is a graph with 6 nodes and 7 edges, with nodes colored blue, green, yellow, orange, red, and purple. The bottom diagram is a graph with 6 nodes and 7 edges, with nodes colored blue, green, yellow, orange, red, and purple, and each node has a list of allowed colors next to it.

The editor interface includes a menu bar (File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, Help), a toolbar with various drawing and editing tools, a Properties panel on the left with color and style options, and a Layers panel at the bottom left. The status bar at the bottom right shows coordinates and resolution: "----+--- 16 45 (-16.000, 160.000) (72ppi)".

Basic Usage

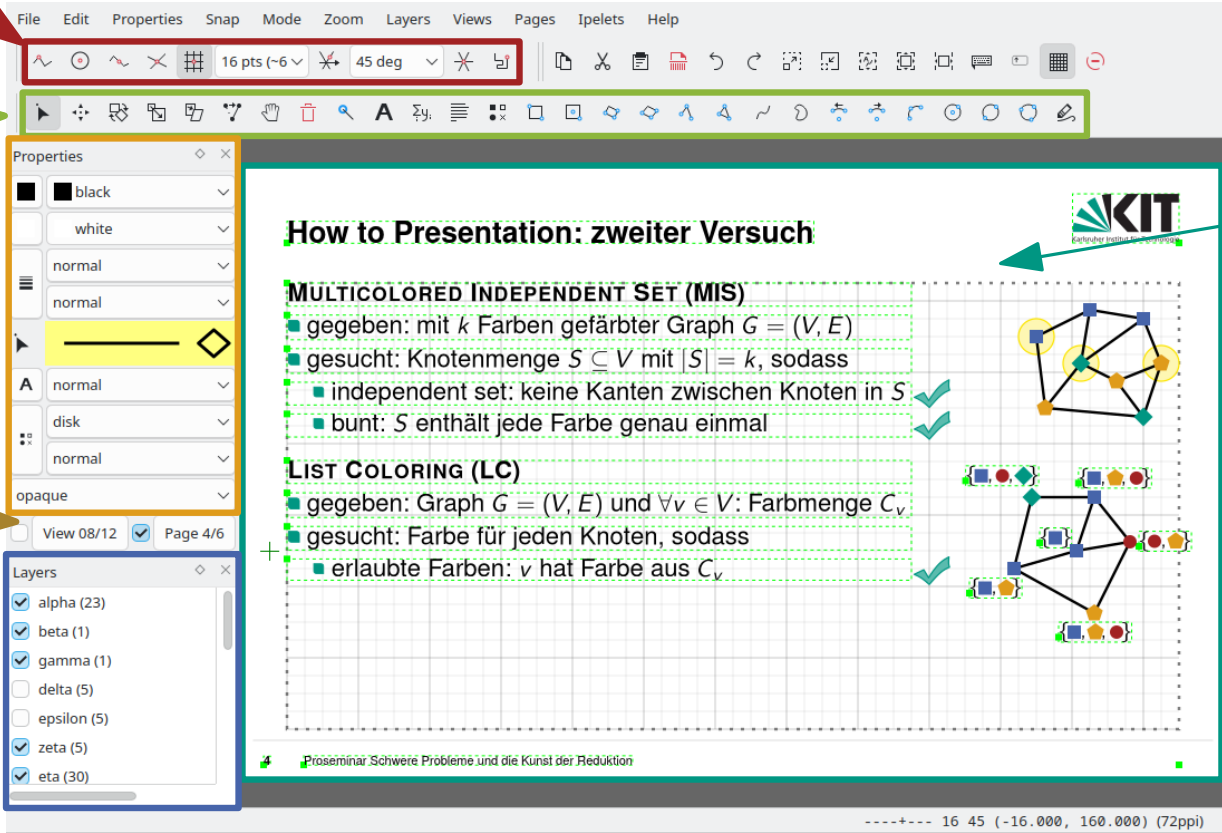


The screenshot shows the Beamer presentation editor interface. The main content area displays a slide titled "How to Presentation: zweiter Versuch" with two sections: "MULTICOLORED INDEPENDENT SET (MIS)" and "LIST COLORING (LC)". The slide includes text and two graph diagrams. The interface includes a menu bar (File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, Help), a toolbar with various drawing tools, and two side panels: "Properties" and "Layers".

Annotations with arrows point to specific parts of the interface:

- snapping**: Points to the "Snap" menu item and the "16 pts (~6)" and "45 deg" options in the toolbar.
- pointer modes / tools**: Points to the toolbar containing various drawing and editing tools.
- properties**: Points to the "Properties" panel, which shows settings for fill color (black, white), stroke color (yellow), line width, font size, and opacity. Below it, the "Layers" panel lists layers alpha (23), beta (1), gamma (1), delta (5), epsilon (5), zeta (5), and eta (30).
- content**: Points to the main slide content area.

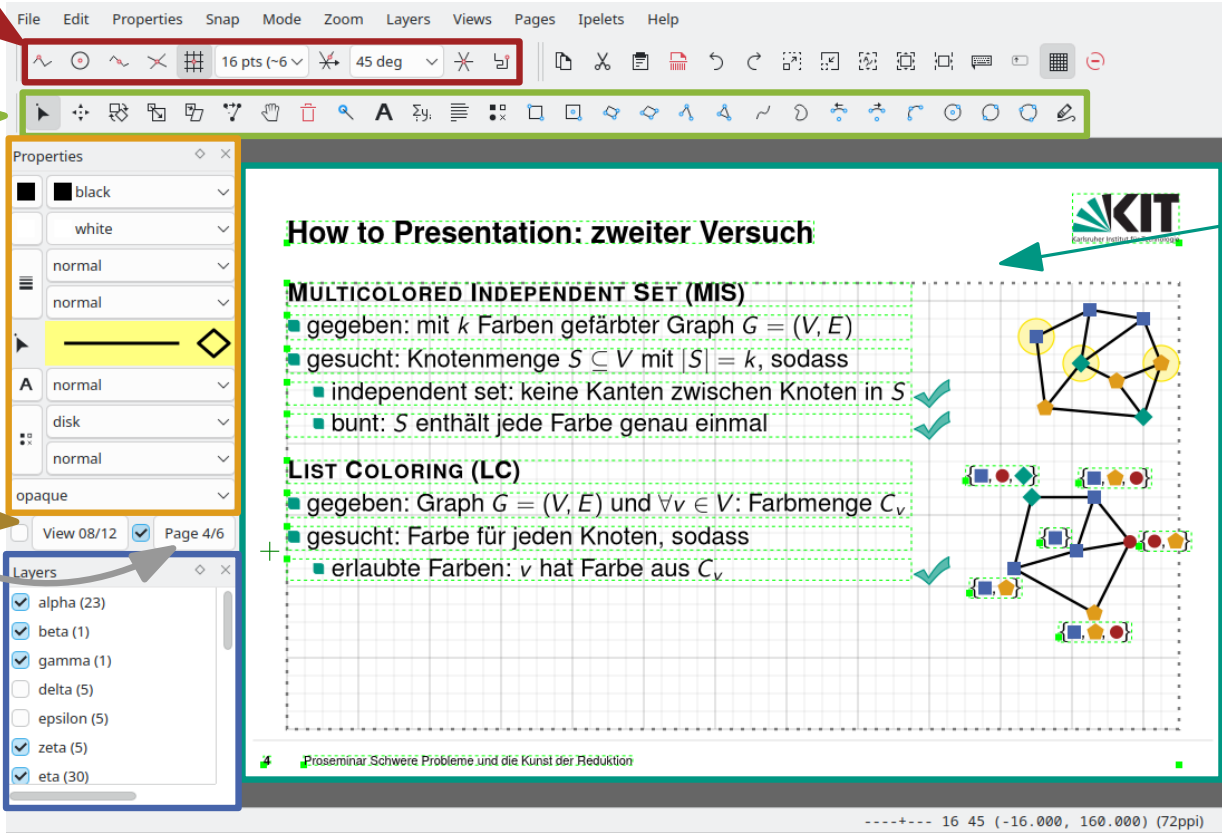
Basic Usage



The screenshot shows the Beamer presentation editor interface. The main content area displays a slide titled "How to Presentation: zweiter Versuch" with two sections: "MULTICOLORED INDEPENDENT SET (MIS)" and "LIST COLORING (LC)". The slide includes text and two graph diagrams. 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, and a Layers panel at the bottom left. Annotations with arrows point to specific parts of the interface:

- snapping**: Points to the "Snap" menu item and the "16 pts (~6)" and "45 deg" options in the toolbar.
- pointer modes / tools**: Points to the drawing tools in the toolbar.
- properties**: Points to the Properties panel, with a sub-note "also: right click on object".
- views**: Points to the "Views" menu item in the top bar.
- layers**: Points to the Layers panel.
- content**: Points to the main slide content area.

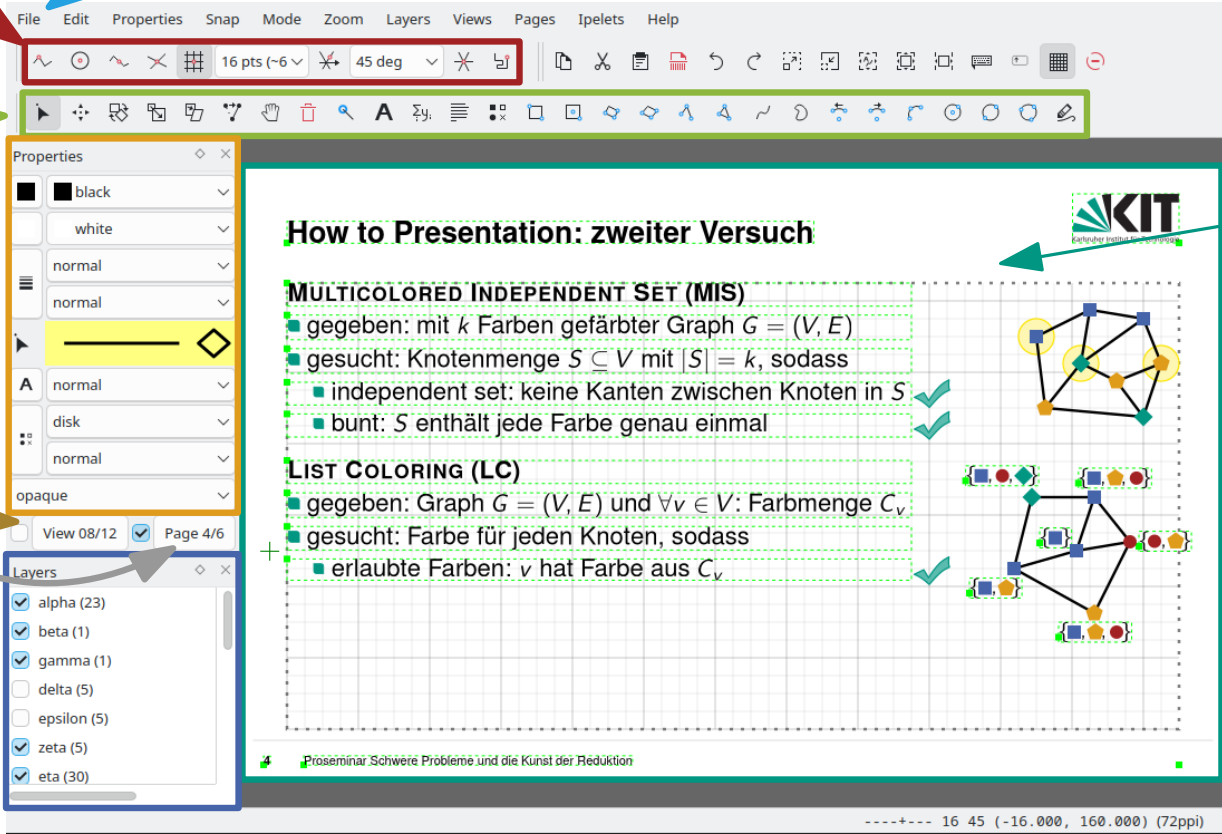
Basic Usage



The screenshot shows the Beamer presentation editor interface. The main content area displays a slide titled "How to Presentation: zweiter Versuch" with two sections: "MULTICOLORED INDEPENDENT SET (MIS)" and "LIST COLORING (LC)". The slide includes text in German and mathematical notation, along with two graph diagrams. The interface includes a menu bar (File, Edit, Properties, Snap, Mode, Zoom, Layers, Views, Pages, Ipelets, Help), a toolbar with various drawing and editing tools, a Properties panel on the left, and a Layers panel at the bottom left. Annotations with arrows point to specific parts of the interface:

- snapping**: Points to the "Snap" menu item and the "16 pts (~6)" and "45 deg" options in the toolbar.
- pointer modes / tools**: Points to the toolbar containing various drawing and editing tools.
- properties**: Points to the Properties panel, which shows settings for fill color (black, white), stroke color (yellow), line width, font size, and other attributes. A note below says "also: right click on object".
- views**: Points to the "Views" menu item in the top menu bar.
- pages**: Points to the "Page 4/6" indicator in the bottom left of the slide area.
- layers**: Points to the Layers panel, which lists layers like alpha (23), beta (1), gamma (1), delta (5), epsilon (5), zeta (5), and eta (30).
- content**: Points to the main slide content area.

Basic Usage



snapping

save as pdf

pointer modes / tools

properties
also: right click on object

views pages

layers

content

How to Presentation: zweiter Versuch

MULTICOLORED INDEPENDENT SET (MIS)

- gegeben: mit k Farben gefärbter Graph $G = (V, E)$
- gesucht: Knotenmenge $S \subset V$ 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

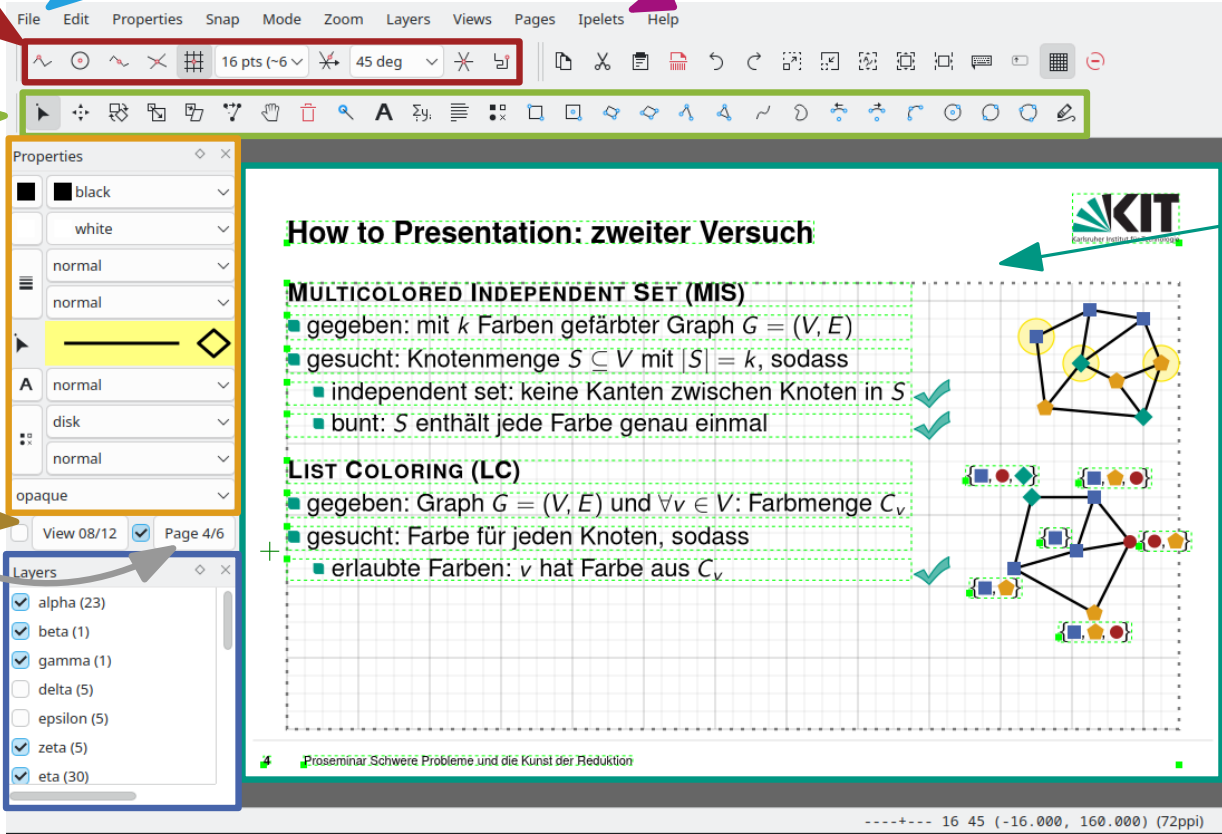
View 08/12 Page 4/6

alpha (23)
beta (1)
gamma (1)
delta (5)
epsilon (5)
zeta (5)
eta (30)

Proseminar Schwere Probleme und die Kunst der Reduktion

----- 16 45 (-16.000, 160.000) (72ppi)

Basic Usage



The screenshot shows the Ipe software interface with several annotations:

- snapping**: Points to the 'Snap' menu item in the top menu bar.
- save as pdf**: Points to the 'Save as PDF' icon in the toolbar.
- ipelets**: Points to the 'Ipelets' menu item in the top menu bar.
- pointer modes / tools**: Points to the toolbar containing various drawing and editing tools.
- properties**: Points to the 'Properties' panel on the left, which includes options for fill color (black, white), stroke color (yellow), font size (normal), font style (normal), font weight (normal), font face (disk), font size (normal), and opacity (opaque). Below this is the 'Layers' panel with a list of layers: alpha (23), beta (1), gamma (1), delta (5), epsilon (5), zeta (5), and eta (30).
- views**: Points to the 'View' and 'Page' options in the bottom left of the interface.
- content**: Points to the main drawing area containing text and diagrams.

The main content area displays the following text and diagrams:

How to Presentation: zweiter Versuch

MULTICOLORED INDEPENDENT SET (MIS)

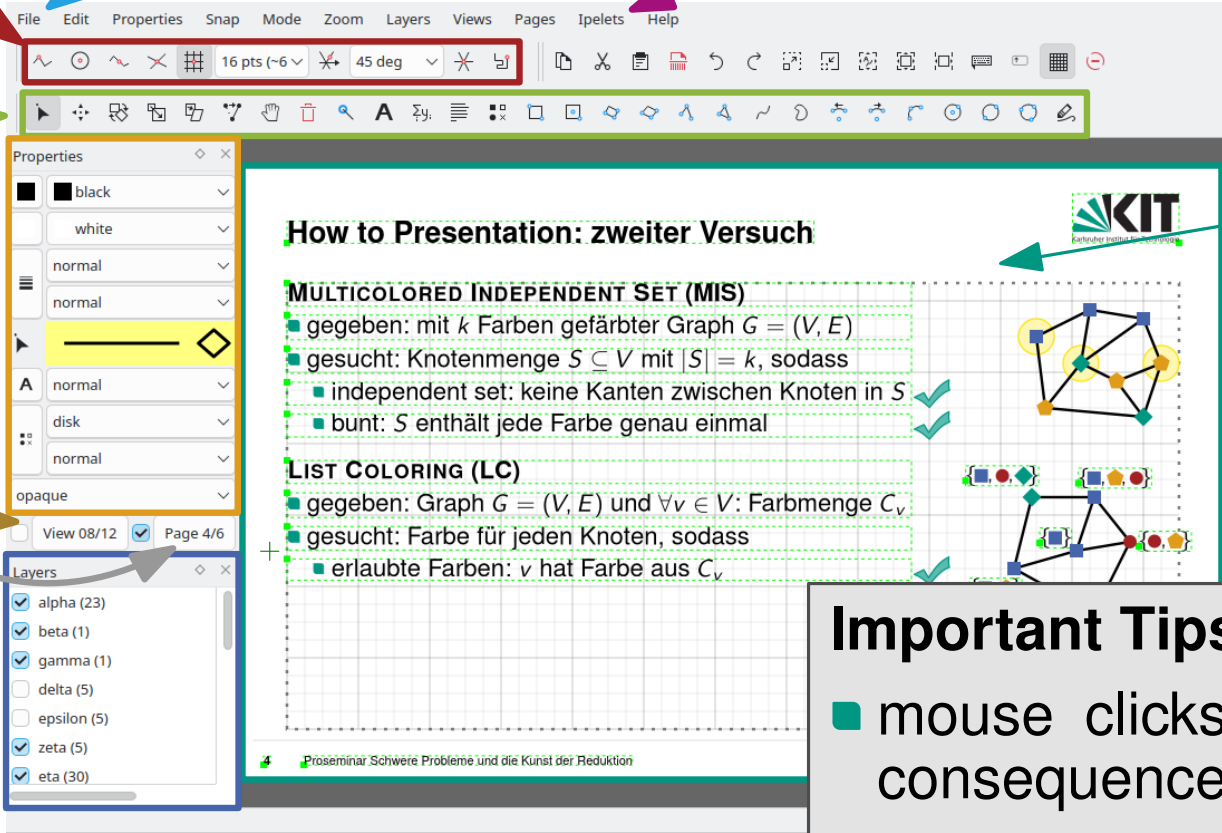
- gegeben: mit k Farben gefärbter Graph $G = (V, E)$
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- gegeben: Graph $G = (V, E)$ und $\forall v \in V$: Farbmenge C_v
- gesucht: Farbe für jeden Knoten, sodass
 - erlaubte Farben: v hat Farbe aus C_v

Two graphs are shown on the right side of the content area, illustrating the concepts of MIS and LC. The first graph has nodes colored with different colors, and the second graph shows nodes with their respective color sets C_v .

Basic Usage



The screenshot shows the Ipe software interface with several annotations:

- snapping**: Points to the 'Snap' menu item in the top menu bar.
- save as pdf**: Points to the 'File' menu item.
- ipelets**: Points to the 'Ipelets' menu item.
- pointer modes / tools**: Points to the toolbar containing various drawing and navigation tools.
- properties**: Points to the 'Properties' panel on the left, which includes options for fill color (black, white), stroke color (yellow), font size (normal), font style (normal), font weight (normal), font face (disk), font size (normal), and opacity (opaque). A note below says "also: right click on object".
- views**: Points to the 'View' dropdown menu.
- pages**: Points to the 'Page 4/6' indicator.
- layers**: Points to the 'Layers' panel on the left, which lists layers alpha (23), beta (1), gamma (1), delta (5), epsilon (5), zeta (5), and eta (30).
- content**: Points to the main presentation area containing text and diagrams.

The main content area displays a presentation slide titled "How to Presentation: zweiter Versuch" with the following text:

MULTICOLORED INDEPENDENT SET (MIS)

- gegeben: mit k Farben gefärbter Graph $G = (V, E)$
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Two graph diagrams are shown: one with nodes colored yellow, blue, and green, and another with nodes colored blue, red, and orange.

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

Basic Usage

Basic Tools

- paths: p, P, b
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- **select: s**
- translate: t
- rotate: r
- scale: e
- **edit: ctrl + e**
- **change width: alt + w**
- **scale / rotate: ctrl + [k/r]**

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Object Properties

- filled shapes
- dash, arrows
- colors, widths, opacity

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Navigation

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

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Z-Order

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

Basic Usage

Basic Tools

- paths: p, P, b
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Snapping

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Z-Order

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

Snapping

Document properties

- ctrl + shift + p

Basic Usage

Basic Tools

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- mouse wheel (pan + zoom)
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Z-Order

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

Snapping

Document properties

- ctrl + shift + p

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

Layers

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

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Views

- subsets of layers
- each view results in a separate pdf page

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Views

- subsets of layers
- each view results in a separate pdf page
- new layer, new view: ctrl + shift + i
- navigating through views: PgUp, Pg-Down, Pos1, End

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Pages

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

Making Presentations: Layers, Views, Pages

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Pages

- independent pages with their own set of layers and views
- new page: ctrl + i
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KIT Template:

<https://gitlab.kit.edu/kit/iti/scale/templates/ipe-presentation>

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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Ipelets

- lua-code for additional functionality
- folder: .ipe/ipelets (see Help → Show config.)
- settings can be changed via this interface

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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"
```

Customization: Style Sheets & Ipelets

Style sheets

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Useful Ipelets

- goodies
- align & distribute
- move
- page numbers

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shortcuts.ipelet_14_align = "Alt+Shift+T"
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Customization: Style Sheets & Ipelets

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Ipelets

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- align & distribute
- move
- page numbers

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"
```

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

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

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Presentation template

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Transparency

Edit as xml

Presentation template

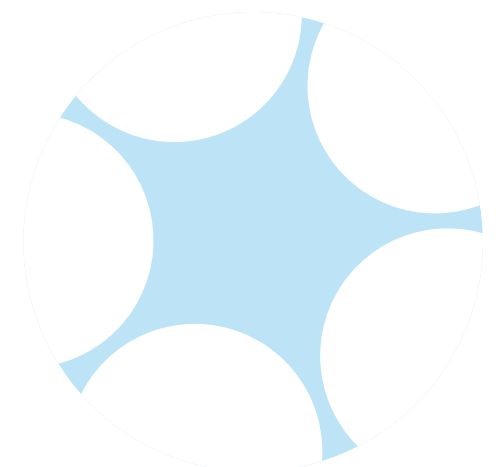
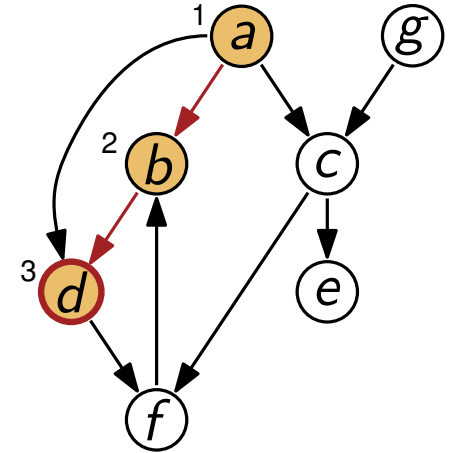
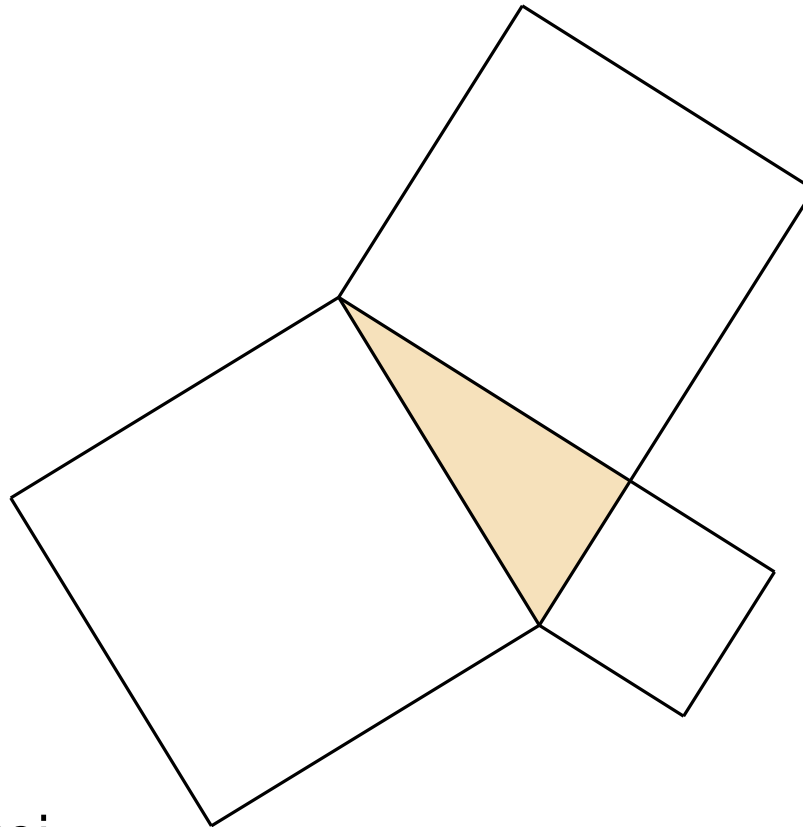
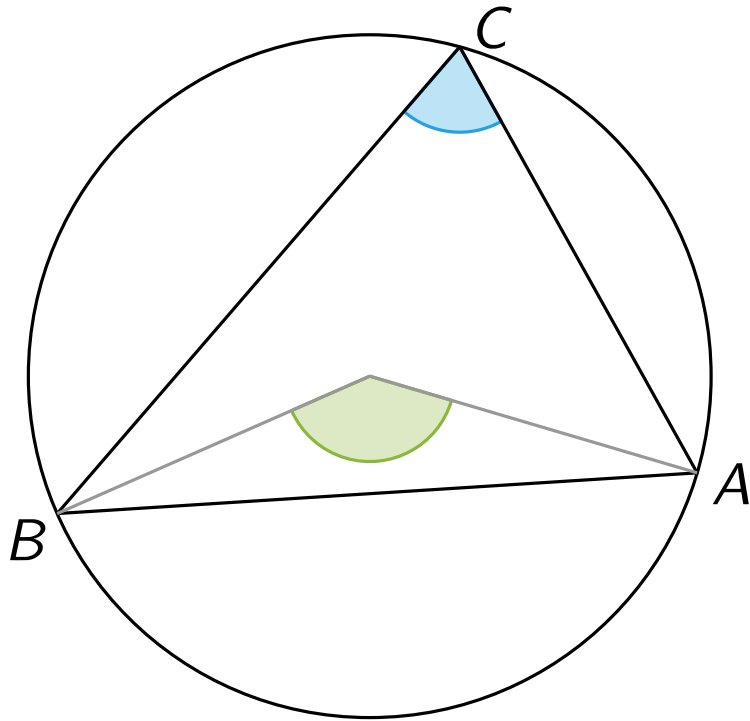
Angular snapping / Coordinate Origin

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

Vorschläge zum Üben

Tutorial zum Durcharbeiten:

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



Also helpful:

Youtube-Playlist by Václav Blažej