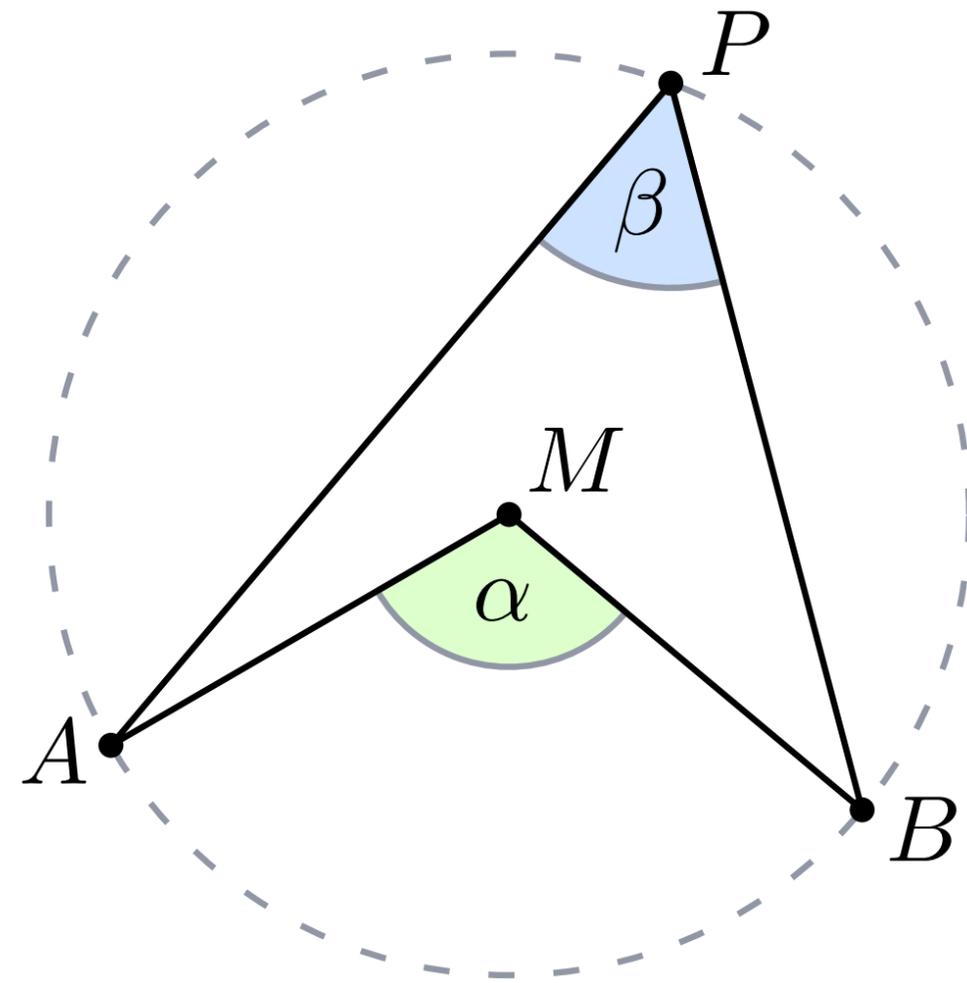


Ipe – Extensible Drawing Editor

Why use Ipe?

tool for drawing vector graphics



Why use Ipe?

tool for drawing vector graphics

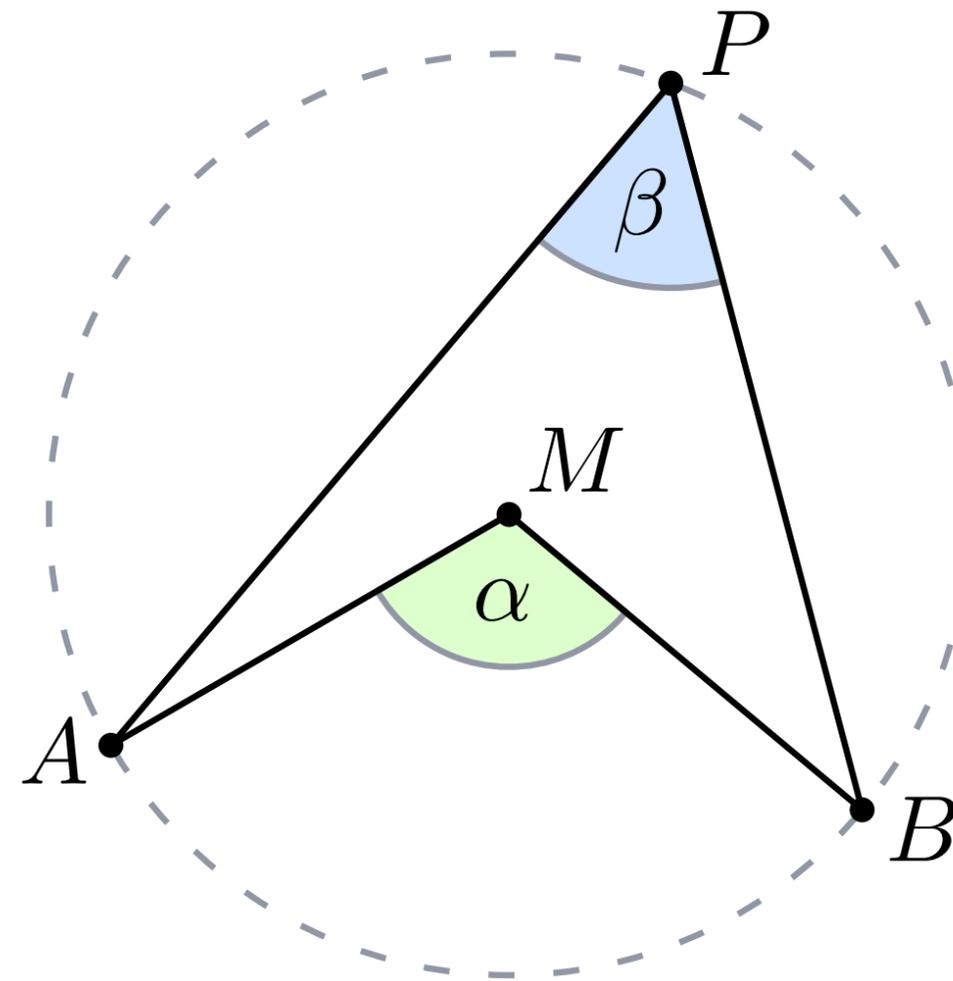
designed for scientific publications

\LaTeX integration

WYSIWYG

supports presentations (including this one)

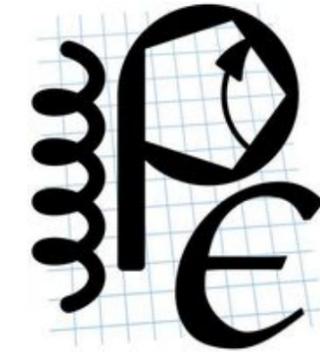
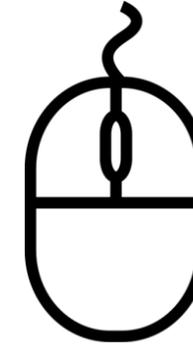
lots of features + extendable



ready, set, . . .

Ipe: download, no installation needed

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



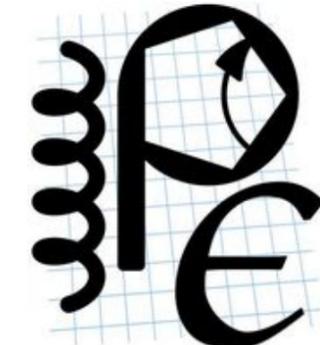
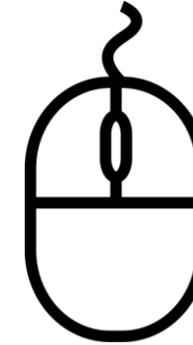
L^AT_EX

ready, set, . . .

Ipe: download, no installation needed

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

requires \LaTeX , but online compilation supported (see Help)



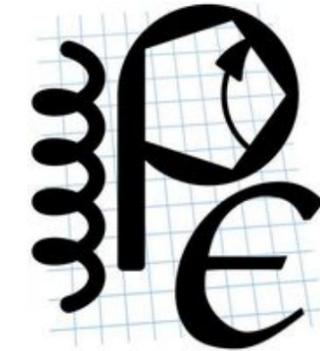
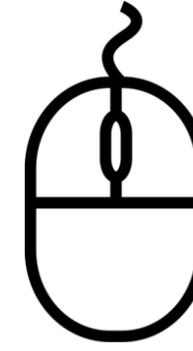
\LaTeX

ready, set, . . .

Ipe: download, no installation needed

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

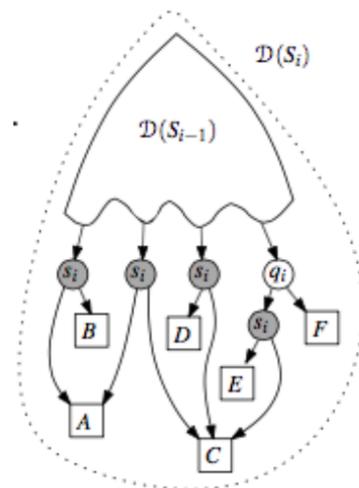
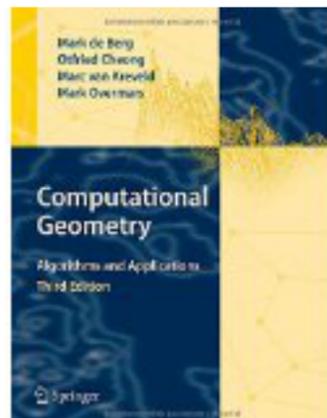
requires \LaTeX , but online compilation supported (see Help)



\LaTeX

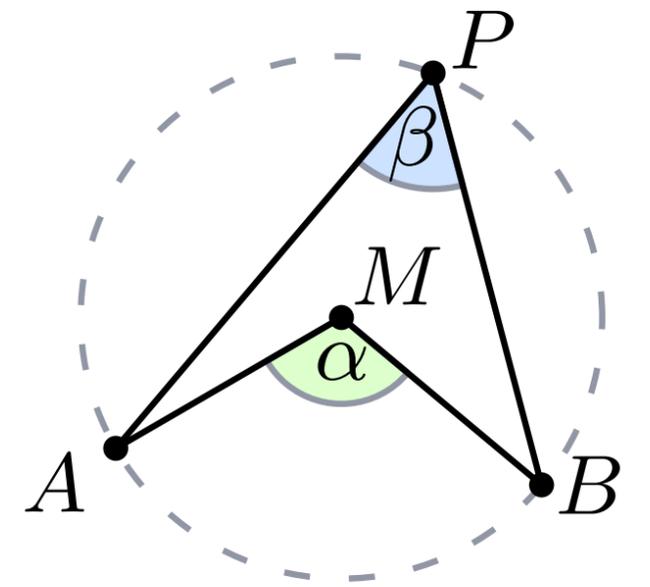
developed by [Otfried Cheong](#)

Professor in Discrete and Computational Geometry
co-author of textbook on Computational Geometry



... go!

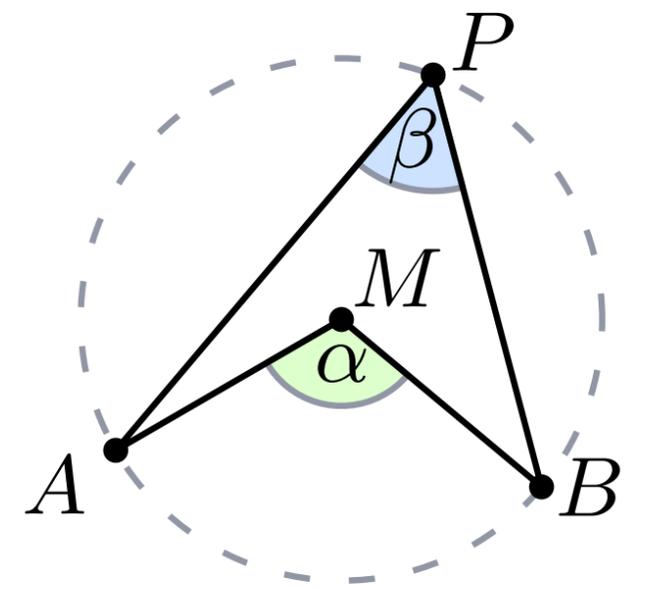
goal: get to know Ipe by drawing this figure



... go!

goal: get to know Ipe by drawing this figure

1.) draw a circle [o]

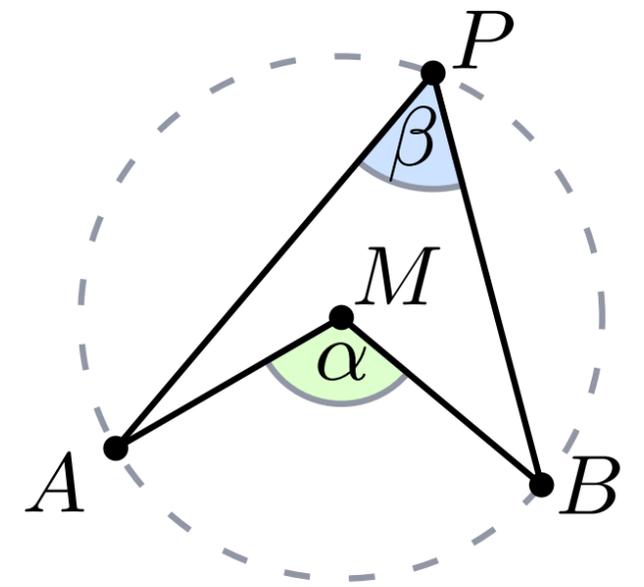


... go!

goal: get to know Ipe by drawing this figure

1.) draw a circle [o]

2.) draw marks [m], but use snapping



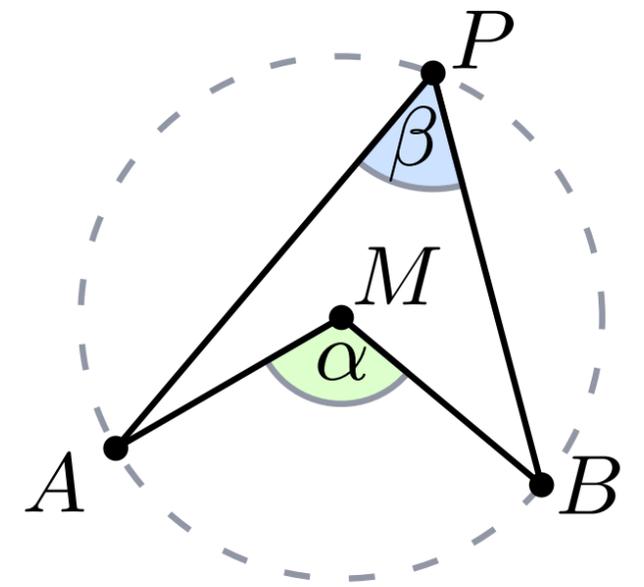
... go!

goal: get to know Ipe by drawing this figure

1.) draw a circle [o]

2.) draw marks [m], but use snapping

center point: snap to control point [Shift + F4]



... go!

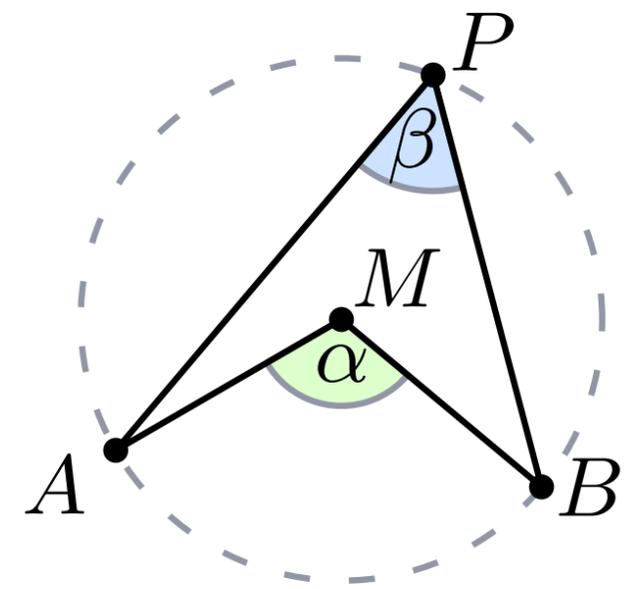
goal: get to know Ipe by drawing this figure

1.) draw a circle [o]

2.) draw marks [m], but use snapping

center point: snap to control point [Shift + F4]

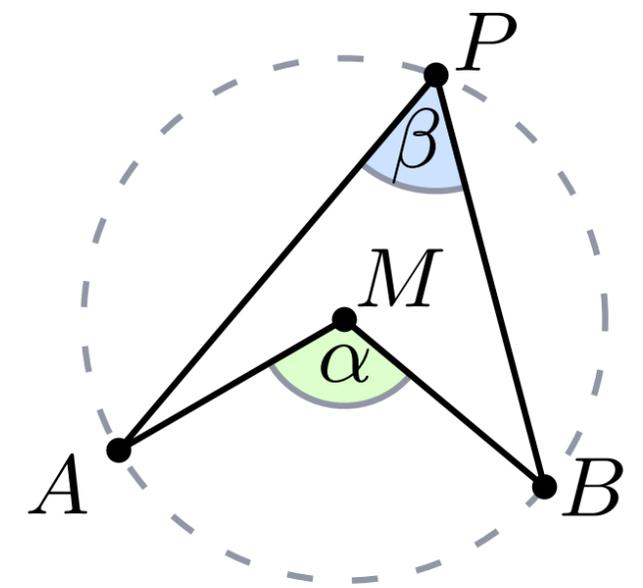
boundary points: snap to boundary [F5]



... go!

goal: get to know Ipe by drawing this figure

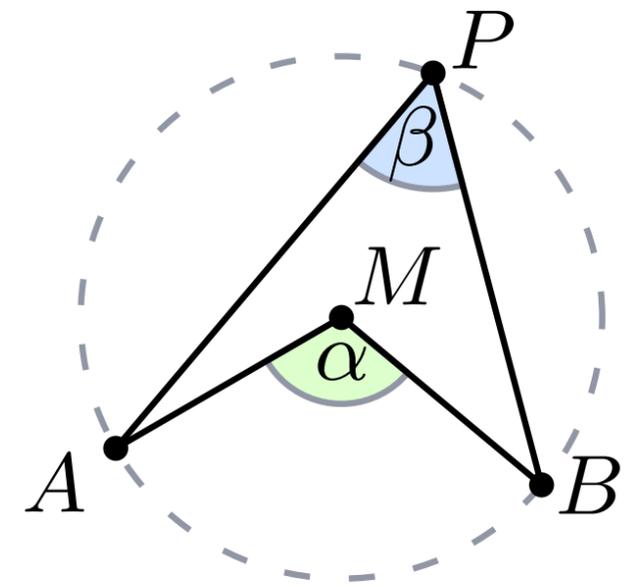
- 1.) draw a circle [o]
- 2.) draw marks [m], but use snapping
center point: snap to control point [Shift + F4]
boundary points: snap to boundary [F5]
- 3.) draw polyline [p] or polygon [shift + p]
[left click] for points, [right click] for last point
snap to vertex [F4]



... go!

goal: get to know Ipe by drawing this figure

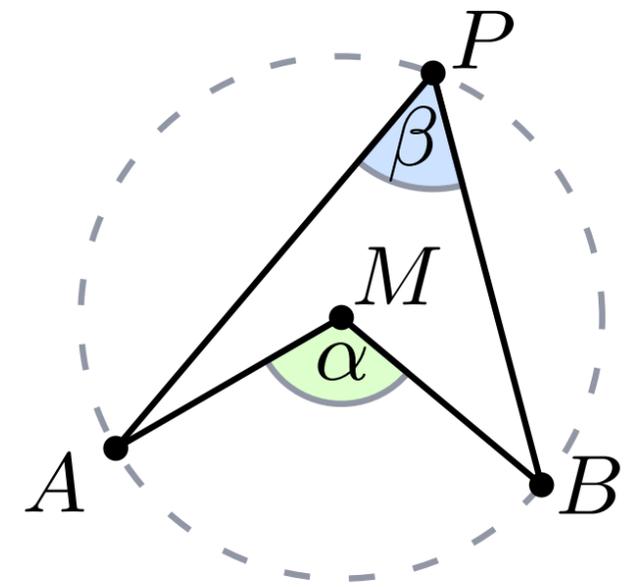
- 1.) draw a circle [o]
- 2.) draw marks [m], but use snapping
center point: snap to control point [Shift + F4]
boundary points: snap to boundary [F5]
- 3.) draw polyline [p] or polygon [shift + p]
[left click] for points, [right click] for last point
snap to vertex [F4]
- 4.) change properties of shapes (color, line thickness, ...)
select [left click], then Properties in sidebar
or [right click] on object



... go!

goal: get to know Ipe by drawing this figure

5. add math labels [\$]



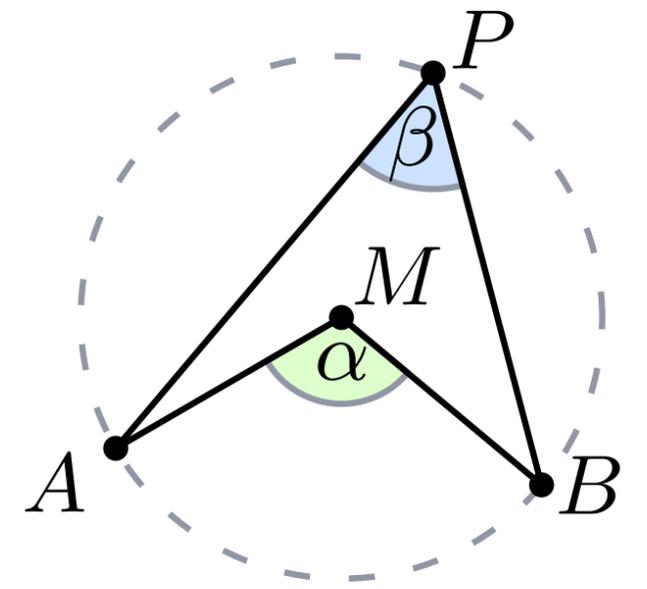
... go!

goal: get to know Ipe by drawing this figure

5. add math labels [\$]

6. fine-tune position of labels

translate [t], switch back to select [s] afterwards
or hold [alt] and drag



... go!

goal: get to know Ipe by drawing this figure

5. add math labels [\$]

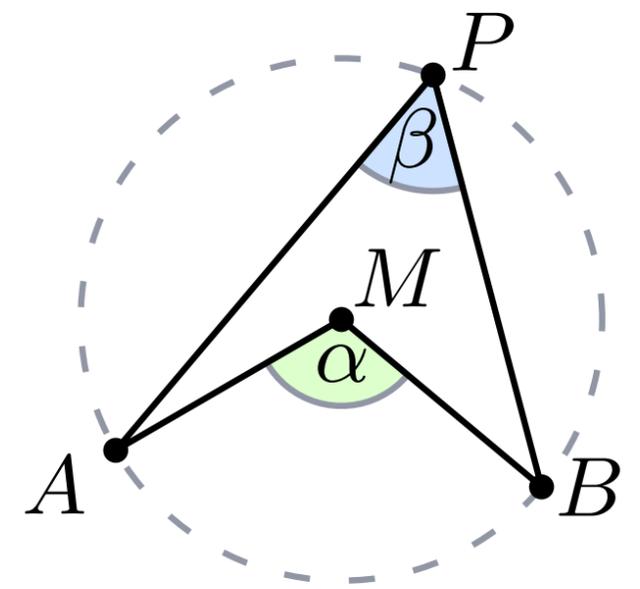
6. fine-tune position of labels

translate [t], switch back to select [s] afterwards
or hold [alt] and drag

7. draw angles

draw circular arc (snap to boundary)

draw polyline (snap to vertex)



... go!

goal: get to know Ipe by drawing this figure

5. add math labels [\$]

6. fine-tune position of labels

translate [t], switch back to select [s] afterwards
or hold [alt] and drag

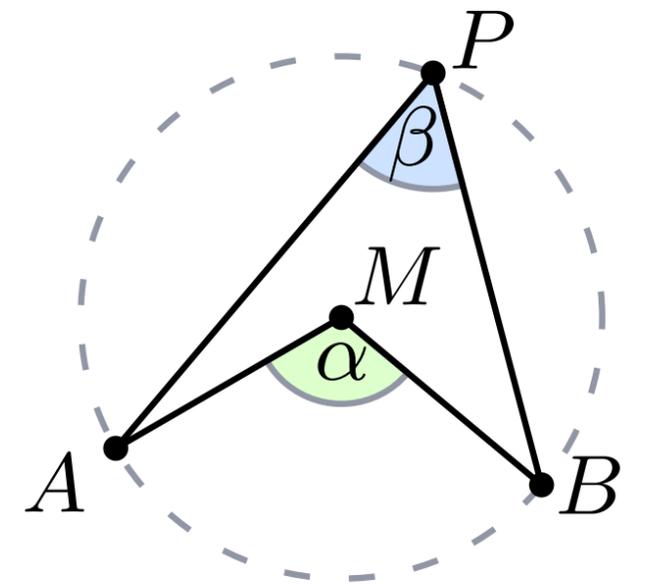
7. draw angles

draw circular arc (snap to boundary)

draw polyline (snap to vertex)

select both (use [shift + left click])

[right click] and "join paths"



... go!

goal: get to know Ipe by drawing this figure

5. add math labels [\$]

6. fine-tune position of labels

translate [t], switch back to select [s] afterwards
or hold [alt] and drag

7. draw angles

draw circular arc (snap to boundary)

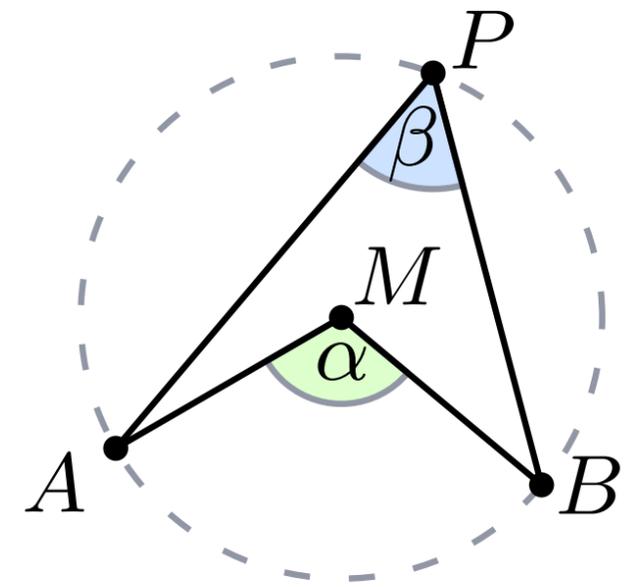
draw polyline (snap to vertex)

select both (use [shift + left click])

[right click] and "join paths"

fill shape + select fill color

move to back [Ctrl + B]



Shapes

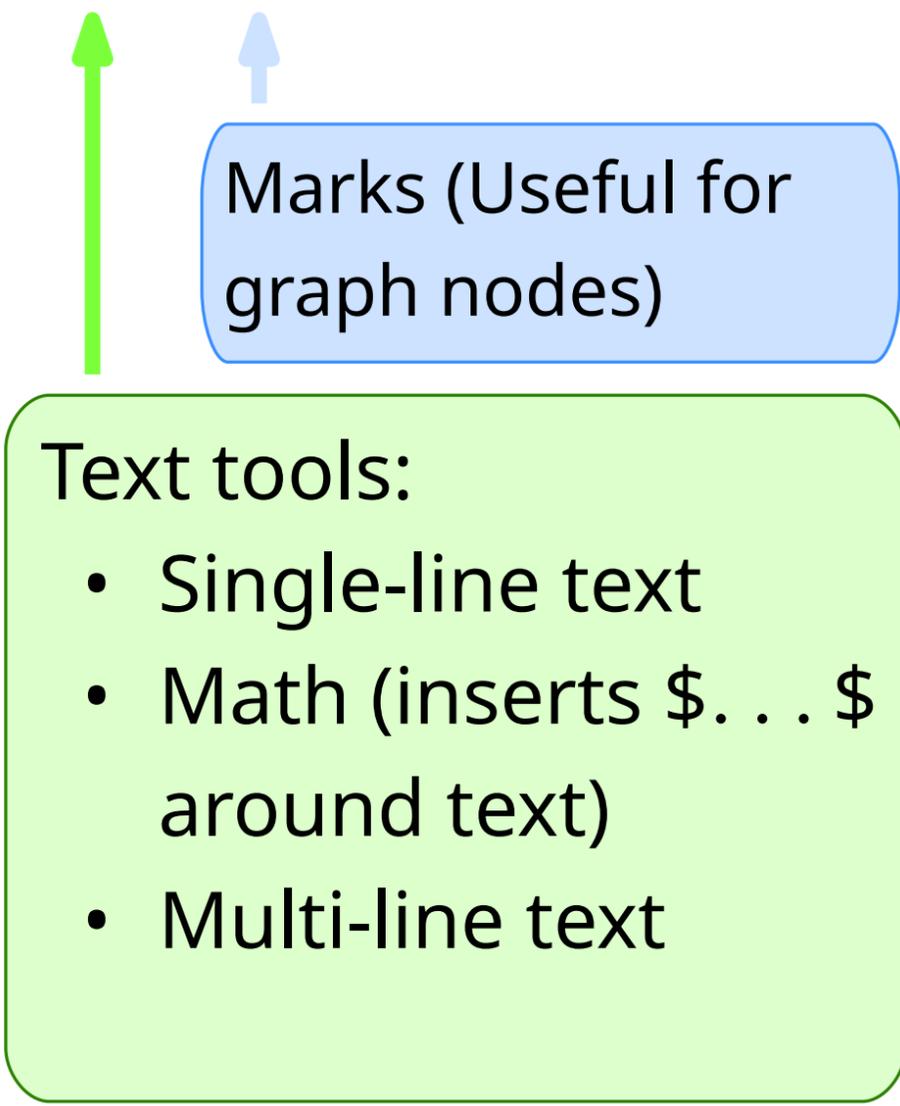
- Box
- Line
- Polylines
- Splines
- Splinegon
- Arcs
- Circles
- Ink



Marks (Useful for graph nodes)

Shapes

- Box
- Line
- Polylines
- Splines
- Splinegon
- Arcs
- Circles
- Ink



Marks (Useful for graph nodes)

Text tools:

- Single-line text
- Math (inserts \dots around text)
- Multi-line text

Shapes

- Box
- Line
- Polylines
- Splines
- Splinegon
- Arcs
- Circles
- Ink

Marks (Useful for graph nodes)

Text tools:

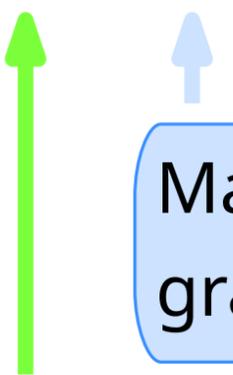
- Single-line text
- Math (inserts \$. . . \$ around text)
- Multi-line text

Shapes

- Box
- Line
- Polylines
- Splines
- Splinegon
- Arcs
- Circles
- Ink

Basic tools:

- Select
- Translate, Rotate, Stretch, . . .
- Move graph node
- Pan
- Shred



Marks (Useful for graph nodes)

Text tools:

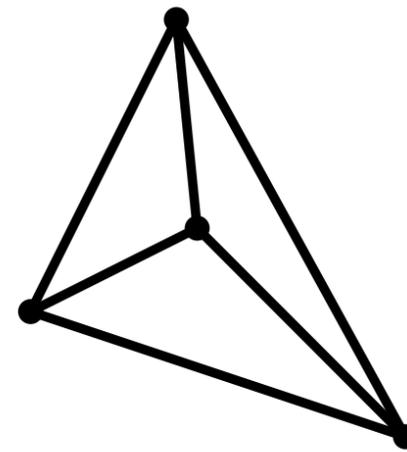
- Single-line text
- Math (inserts \$. . . \$ around text)
- Multi-line text

Shapes

- Box
- Line
- Polylines
- Splines
- Splinegon
- Arcs
- Circles
- Ink

Basic tools:

- Select
- Translate, Rotate, Stretch, . . .
- Move graph node
- Pan
- Shred





Marks (Useful for graph nodes)

Text tools:

- Single-line text
- Math (inserts \$. . . \$ around text)
- Multi-line text

Shapes

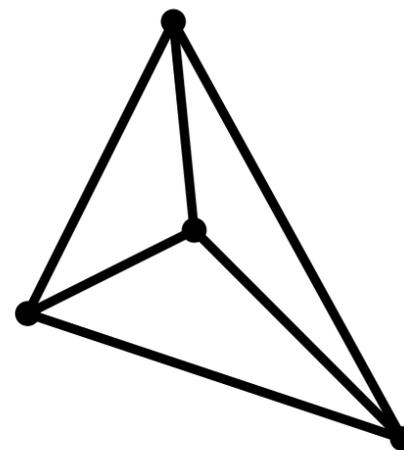
- Box
- Line
- Polylines
- Splines
- Splinegon
- Arcs
- Circles
- Ink

Snapping and grid options

- Snap to vertex
- Snap to line, arc
- Snap to intersection
- Snap to grid
- . . .

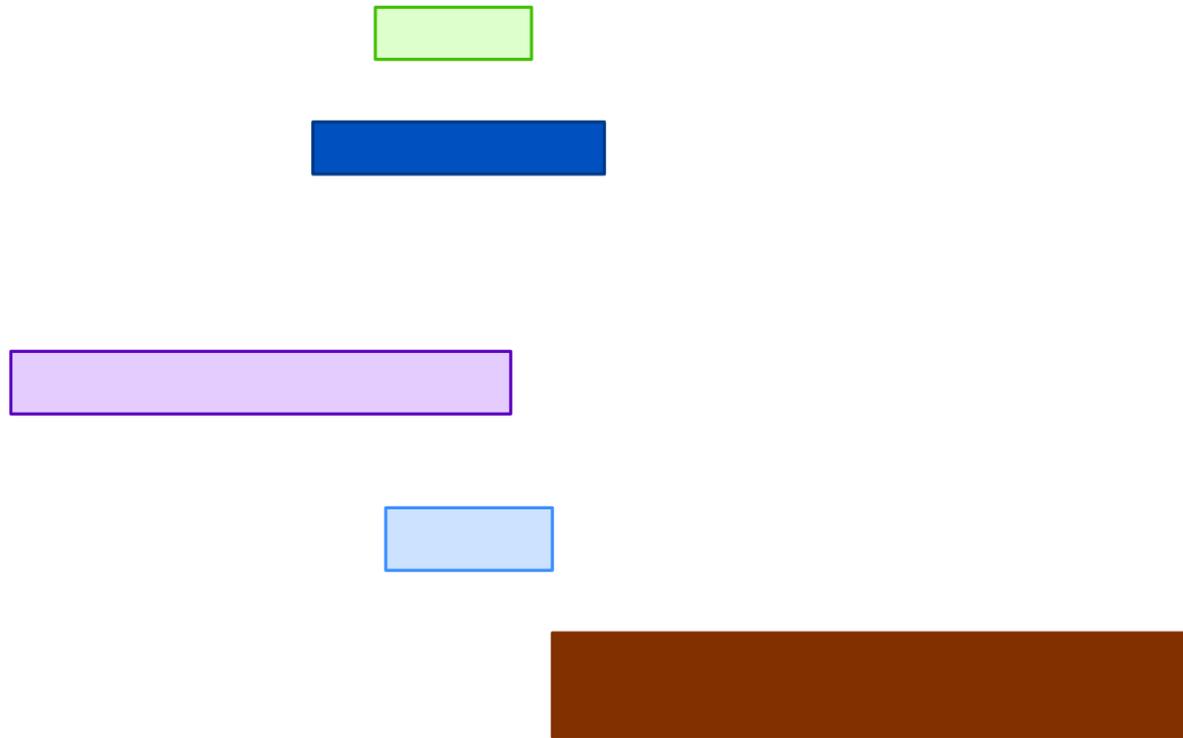
Basic tools:

- Select
- Translate, Rotate, Stretch, . . .
- Move graph node
- Pan
- Shred



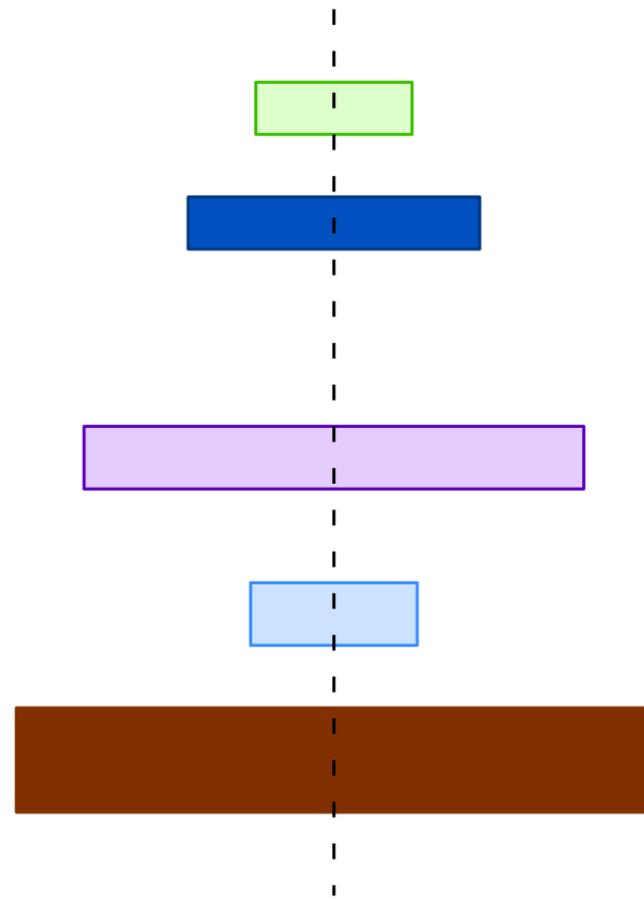
Built-in Ipelet: Align & Distribute

Ipelets: extensions, some built in



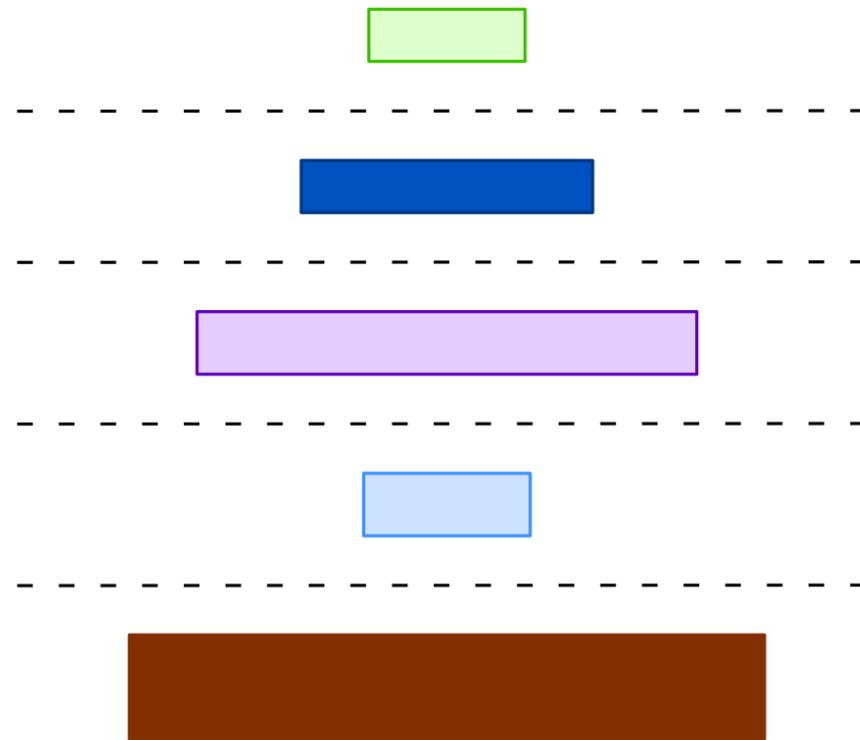
Built-in Ipelet: Align & Distribute

Align H Center



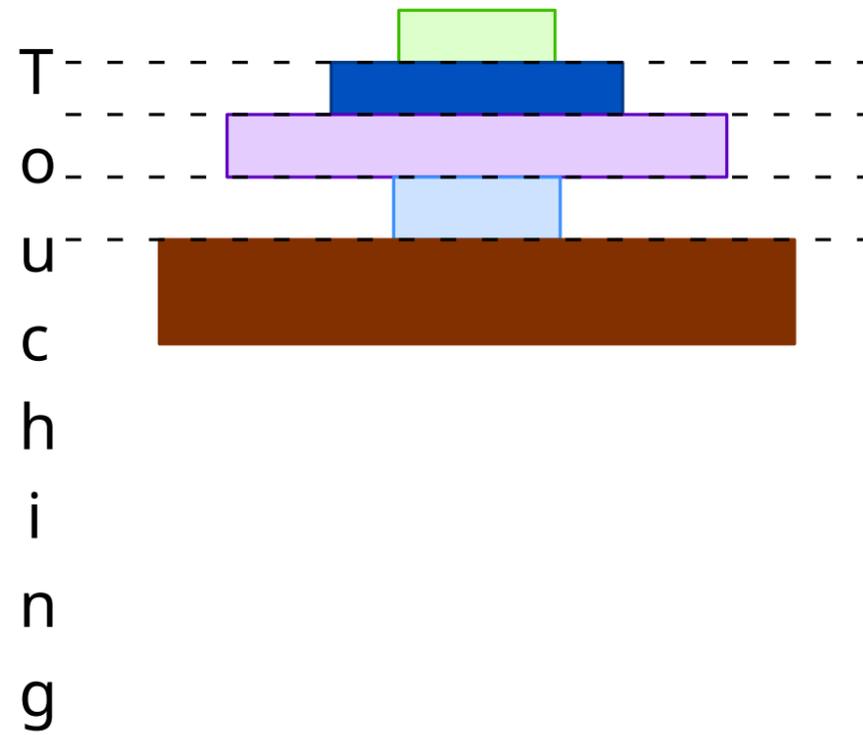
Built-in Ipelet: Align & Distribute

Distribute
Vertically



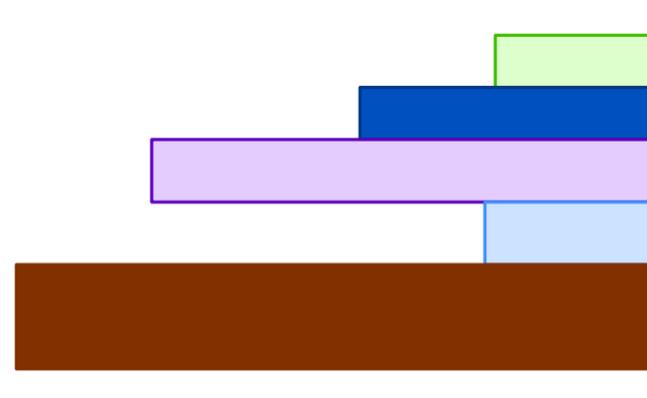
Built-in Ipelet: Align & Distribute

Distribute Top
to Bottom



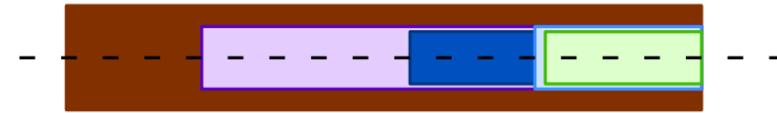
Built-in Ipelet: Align & Distribute

Align Right



Built-in Ipelet: Align & Distribute

Align V Center



Layers, Views, & Pages

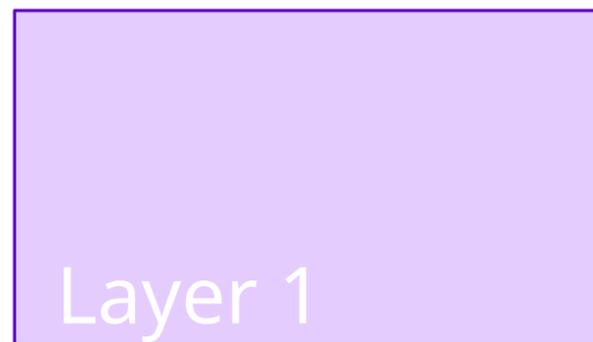
Layers

- Collection of objects
- Can hide and show layers
- The **active** layer is currently being edited
- Not necessarily in depth order
- You can rename and sort

Layers, Views, & Pages

Layers

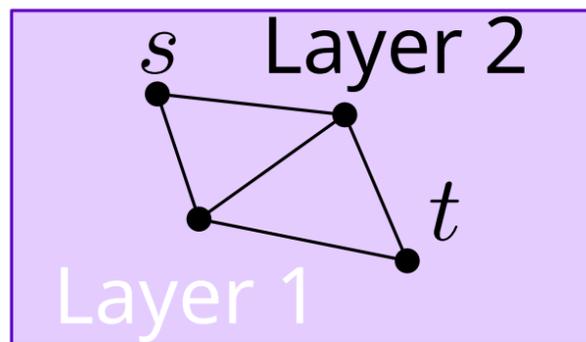
- Collection of objects
- Can hide and show layers
- The **active** layer is currently being edited
- Not necessarily in depth order
- You can rename and sort



Layers, Views, & Pages

Layers

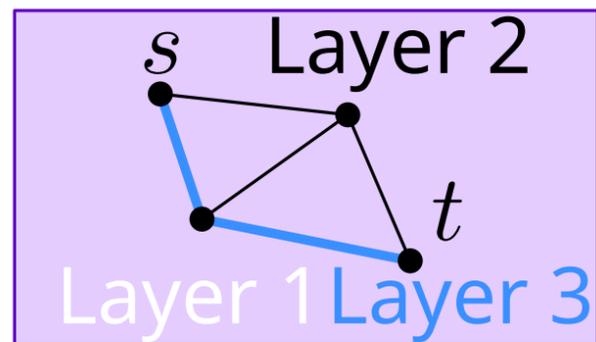
- Collection of objects
- Can hide and show layers
- The **active** layer is currently being edited
- Not necessarily in depth order
- You can rename and sort



Layers, Views, & Pages

Layers

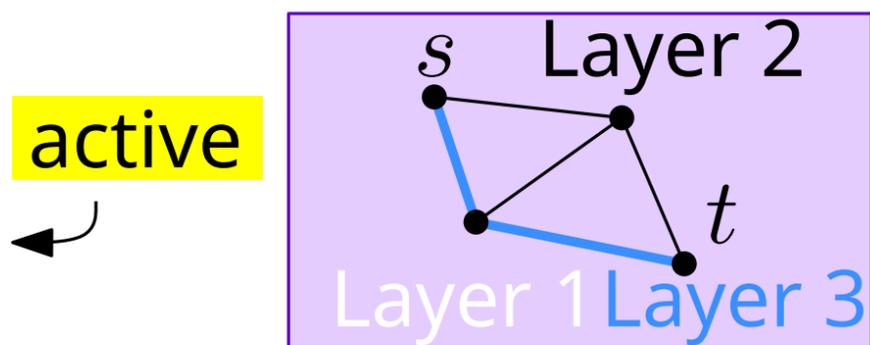
- Collection of objects
- Can hide and show layers
- The **active** layer is currently being edited
- Not necessarily in depth order
- You can rename and sort



Layers, Views, & Pages

Layers

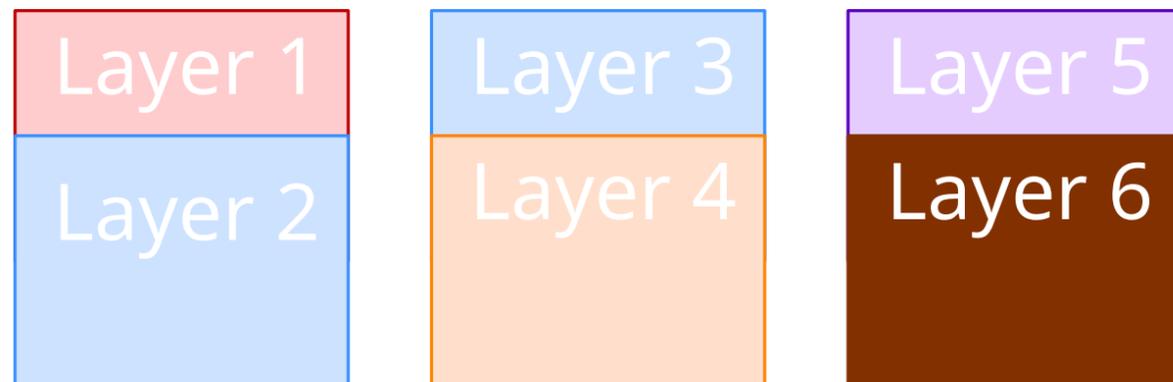
- Collection of objects
- Can hide and show layers
- The **active** layer is currently being edited
- Not necessarily in depth order
- You can rename and sort



Layers, Views, & Pages

A view is...

- a collection of visible layers
- helpful for presentations
- used to create [animations](#)
- associated with one page in the PDF

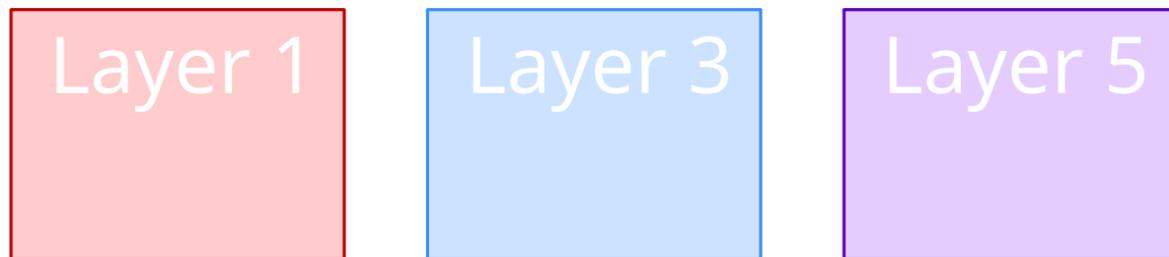


View 1

Layers, Views, & Pages

A view is...

- a collection of visible layers
- helpful for presentations
- used to create [animations](#)
- associated with one page in the PDF



View 2

Layers, Views, & Pages

A view is...

- a collection of visible layers
- helpful for presentations
- used to create [animations](#)
- associated with one page in the PDF



View 3

Layers, Views, & Pages

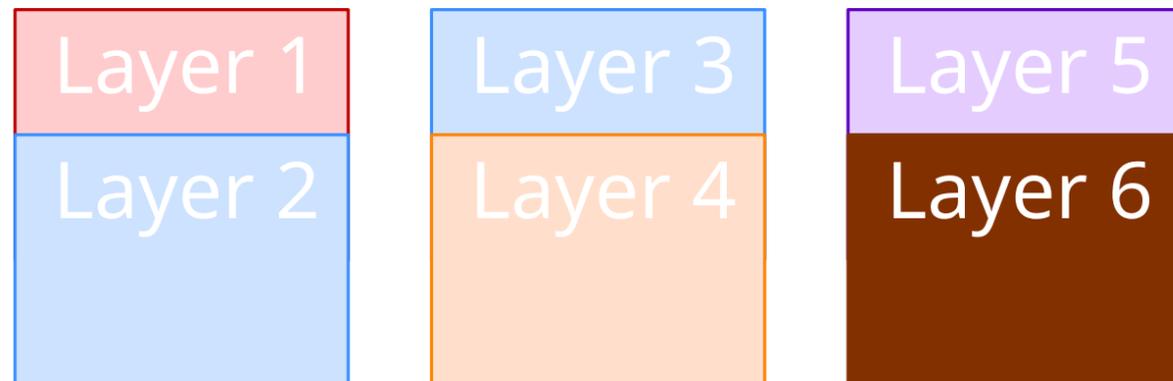
A page is...

- a collection of views
- one or more pages in the PDF output
- each slide of a presentation
- set title: Ctrl-P

Layers, Views, & Pages

A page is...

- a collection of views
- one or more pages in the PDF output
- each slide of a presentation
- set title: Ctrl-P



View 1 / Page 1

Layers, Views, & Pages

A page is...

- a collection of views
- one or more pages in the PDF output
- each slide of a presentation
- set title: Ctrl-P

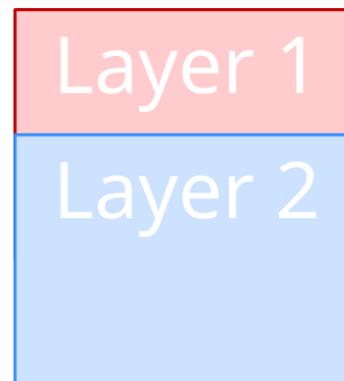


View 2 / Page 1

Layers, Views, & Pages

A page is...

- a collection of views
- one or more pages in the PDF output
- each slide of a presentation
- set title: Ctrl-P



View 3 / Page 1

Style sheets

- Written in Ipe's XML format

Style sheets

- Written in Ipe's XML format
- Load: [Edit](#) → [Style sheets](#)

Style sheets

- Written in Ipe's XML format
- Load: [Edit](#) → [Style sheets](#)
- Example: `seminar.isy`

[Tip: Check in the ipe subfolder /styles](#)

Style sheets

- Written in Ipe's XML format
- Load: [Edit](#) → [Style sheets](#)
- Example: `seminar.isy`

[Tip: Check in the ipe subfolder /styles](#)

[Style sheets can specify:](#)

- presentation—slide layout
- symbols
- colors
- dashes
- thickness
- transparency
- grids
- fonts
- ...

Style sheets

- Written in Ipe's XML format
- Load: [Edit](#) → [Style sheets](#)
- Example: `seminar.isy`

Style sheets can specify:

- presentation—slide layout
- symbols
- colors
- dashes
- thickness
- transparency
- grids
- fonts
- ...

Tip: Check in the ipe subfolder `/styles`

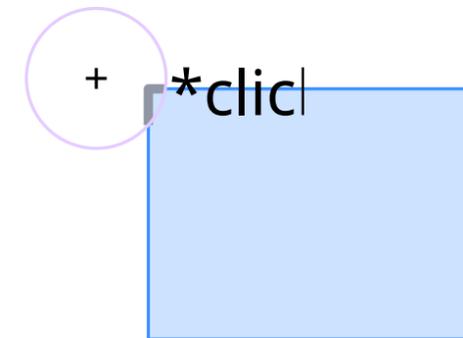
Tip: you can save the style sheets
of any ipe file!



Selecting Objects

Selecting a single object

- Need to click the boundary of an object
- Hard to select marks (can use space to select from multiple objects)



Selecting Objects

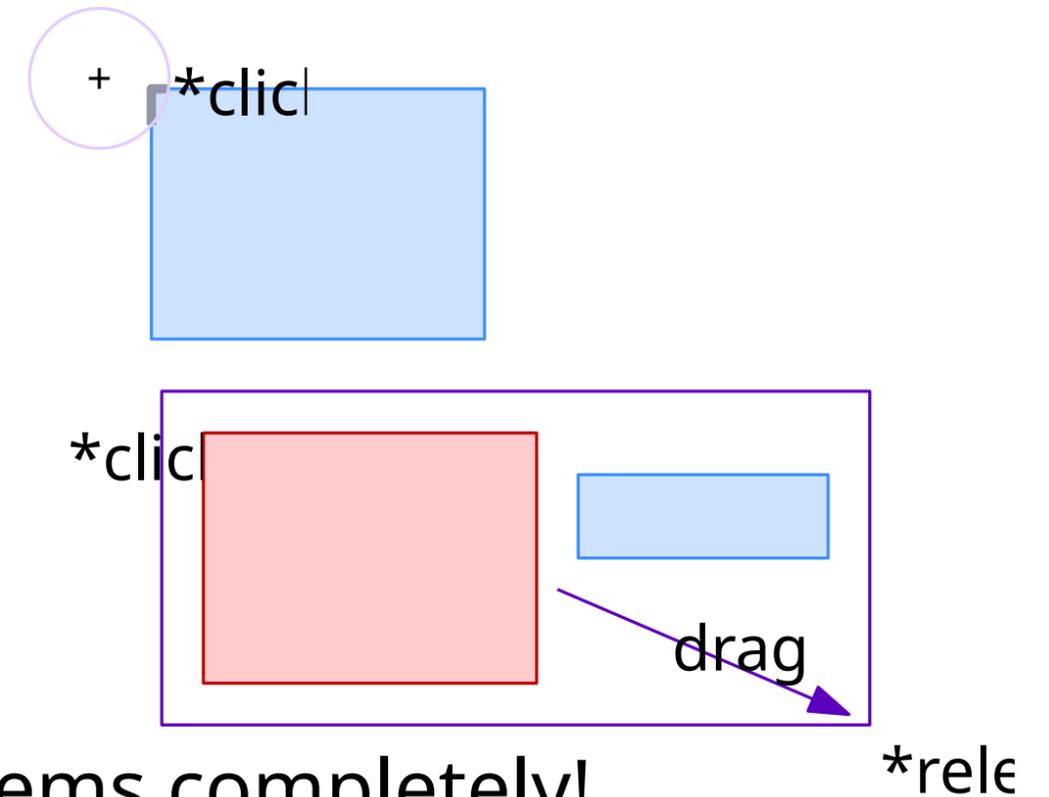
Selecting a single object

- Need to click the boundary of an object
- Hard to select marks (can use space to select from multiple objects)

Selecting multiple objects

- Hold Shift to select multiple objects
- Selection box **from left to right** must contain the items completely!
- Selection box from **right to left** selects everything intersecting it!
- Might be hard to select a few objects that overlap other objects
- **Solution:** Use layers to hide objects you don't want to select
[Ctrl + Shift + A] Select all from active layer

Select by type / attribute in Ipelets menu



Quirks

Pasting from other Ipe files

- Make sure you have the same style sheets
- If missing colors, etc., objects will not look the same
- Can be difficult to troubleshoot.

Object properties

- UI elements don't match the current selection
- UI always shows the last property picked

Quirks

Pasting from other Ipe files

- Make sure you have the same style sheets
- If missing colors, etc., objects will not look the same
- Can be difficult to troubleshoot.

Object properties

- UI elements don't match the current selection
- UI always shows the last property picked

Useful Shortcuts

Note: Many shortcuts are documented in the tooltips, but not all

[S] to switch to “select mode”: Select objects by left click

[T] to switch to “translate mode”: Selected object can be moved around

[Alt+1–9] to move the selected objects by 0.1 point

[Ctrl+1–9] to move the selected objects by 1 point

[E] to stretch the selected objects; press [Shift] while dragging to keep the aspect ratio

[Ctrl+K] to stretch by a precise factor

[Ctrl+R] to rotate by a precise angle

check Transformations (Right Click)

[P] to get the polyline tool

[M] to get the marker tool

[L+Click] to insert a one line text label

[G+Click] to insert a text box (internally, this is just a latex minipage)

[F10] to insert horizontally pinned textbox of textwidth size

below the present items

Aligning and Positioning

Ipe has several snap modes, most importantly:

[F4] snap to a vertex, e.g. a corner of a polyline or a marker

[F5] snap to a boundary, e.g. a polyline or a circle

[F7] snap to the grid

[F8] snap to the angular coordinate system

[F1] Show the angular snap coordinate axis

[Ctrl+F1] Hide the angular snap coordinate axis

[F2] align the angular snap coordinate axis to where the mouse points

[Alt+Shift+V] distribute the selected objects vertically

[Shift+V] center the selected objects vertically relative to the last selected object

[Shift+H] center the selected objects horizontally relative to the last selected object

[Shift+C] center the selected objects relative to the last selected object

See “Ipelets → Align & Distribute” and “Ipelets → Move” for more options

Pages, Layers, and Views

[Ctrl+I] create a new page

[Ctrl+Shift+N] create a new layer and view on the current page

[Ctrl+Shift+A] select objects in the currently active layer, i.e. layer marked in the left sidebar

[Ctrl+Shift+C/V/X] copy, cut, paste a whole page

[Ctrl+B] move object to the back of the page; [Ctrl+Shift+B] move backwards

[Ctrl+F] move object to the front of the page; [Ctrl+Shift+F] move forwards

[Ctrl+P] Page properties

[Ctrl+Shift+P] Document properties; here you can edit the latex preamble of the document

More hints

A few useful shortcuts, not necessarily hinted in the menus:

[Ctrl+E] to enter the edit mode of most objects

[Q] to pick properties (e.g. colors or dashes) from the selected object

[Ctrl+Q] to apply picked properties to the selected objects

[\] to center the page

If you want to change any settings:

Create a "customization.lua" ipelet

"Help → Show configuration" to see relevant paths, e.g. where ipelets go on your system

See "Help → Preferences" for further hints on how to edit the settings

What will you draw?