INKSCAPE

Draw Freely.

http://www.inkscape.org/

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What is Inkscape?

http://www.inkscape.org/

- Vector Graphics editor application

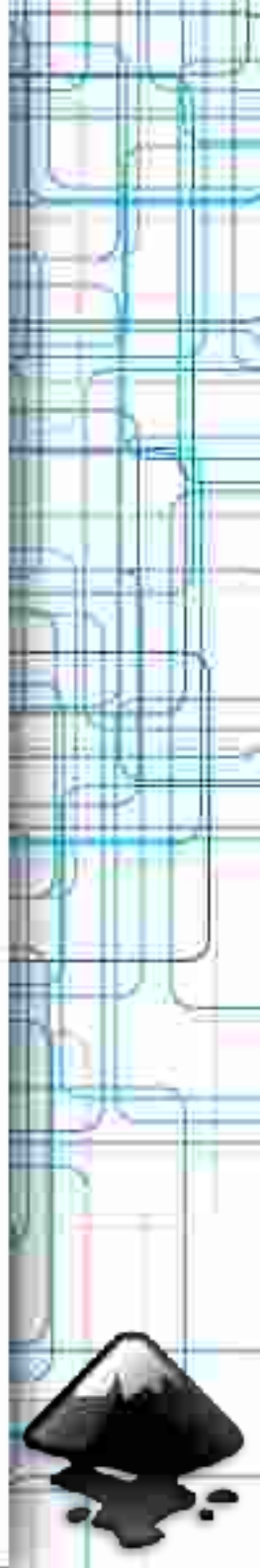
- Capabilities similar to Illustrator, Freehand, CorelDraw, Visio or Xara X

- Latest stable version: **0.47**

- Uses the W3C standard 'Scalable Vector Graphics' (SVG) file format (XML-based)

History of Inkscape

- Code fork of SODIPODI project
- SODIPODI was based on GILL
- Started in 2003 (6 years ago)
- Forked by Bryce Harrignton, Nathan Hurst, Ted Gould, MenTaLguY



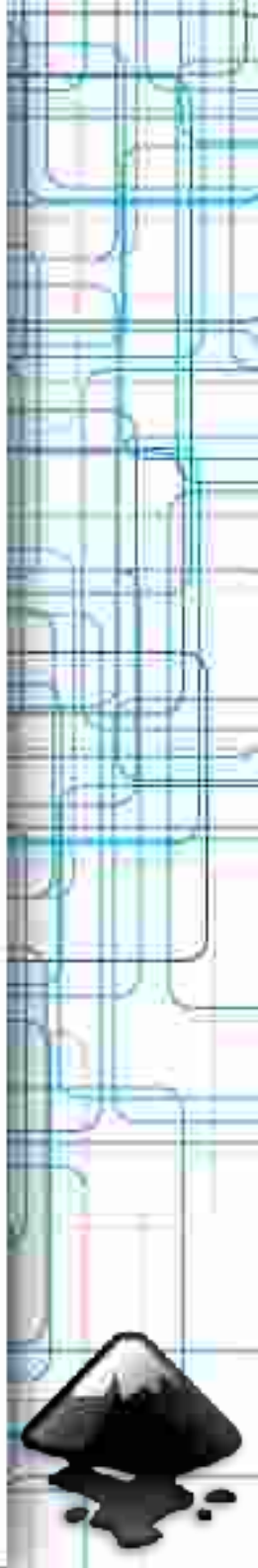
Inkscape: *General* Features

• Distributed under free software license, the GNU GPL.

• Cross-platform:
  - Mac OS X
  - Unixes
  - Linuxes
  - BSDs
  - MS Windows family (a portable version is also available)

• Multi-lingual support including complex scripts, currently lacking in most commercial vector graphics applications.

• Under active development, with new features being added regularly.



Inkscape: *General* Features

• Key to productivity in Inkscape is the use of keyboard and mouse shortcuts
  - http://inkscape.org/doc/keys047.html

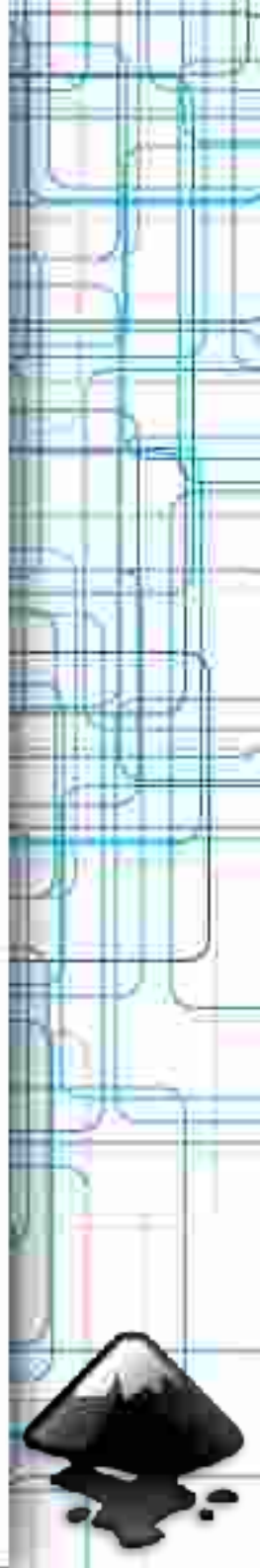
• Powerful command line interface (can be used in scripts for exporting, format conversions etc)
  - http://inkscape.modevia.com/inkscape-man.html

• XML Editor (SHIFT+CTRL+X):
  - Displays the entire XML tree of the document, always reflecting its current state.
  - Edit drawing and watch the corresponding changes in the XML tree.
  - Edit any text, element, or attribute nodes in the XML editor and see the result on canvas.

• More than 40 interface languages

• Experimental support for scripting.

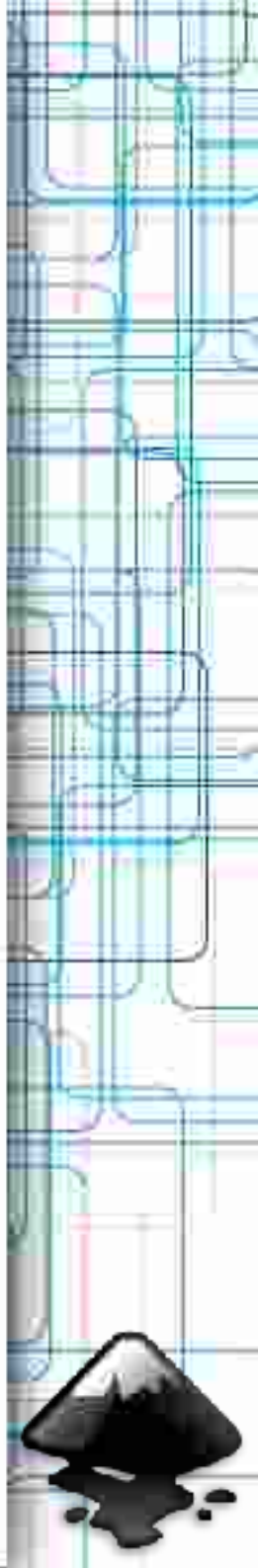
•Large number of Import/Export filetypes supported



Inkscape: Goals

Its stated goal is to become:

- Powerful graphics tool
- Fully compliant with the XML, SVG, and CSS standards (Implementation of SVG and CSS standards has shown gradual improvement, but still is incomplete).
- Stability
- Performance
- State of art vector graphics features
- An efficient, innovative and intuitive User Interface



Inkscape: Technical Specifications

Programming language: **C++**

GUI library/widget toolkit: **GTK+** (GIMP Tool Kit)
i.e. **C++ bindings (gtkmm)**

Renderer: livarot (plans to migrate to **cairo**)

Warning

Inkscape crashes sometimes!!!

- Inkscape is a child ;-)

- Supports automatic backups in case of crash

- Inkscape may still be unstable, so remember to press 'CTRL+S' often!

What is SVG ?

• W3C Open, standard family of specifications (includes SVG, SVG mobile, SVG Print). Used by Wikipedia, openclipart.org etc.)

● Filetype extension- .svg (Also .svgz i.e. compressed SVG)

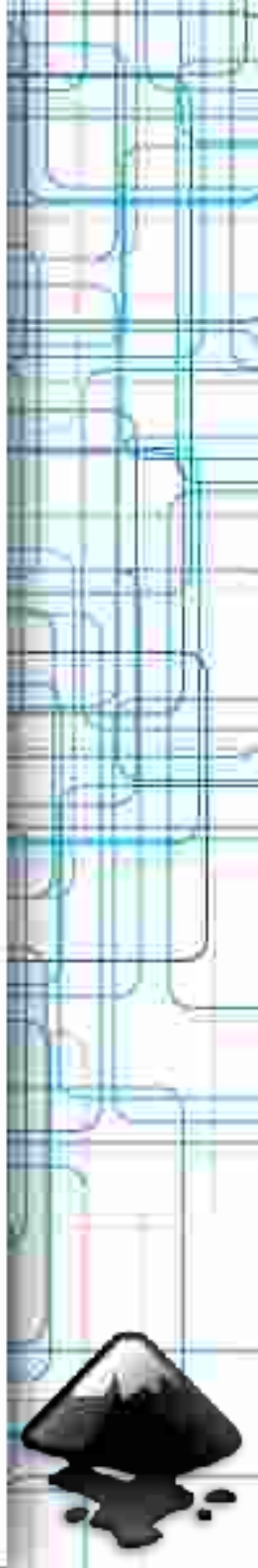
● Authored by Canon, HP, Adobe and Corel, Nokia etc.

● XML based file format for 2D web graphics (can be searched, indexed, scripted, compressed)

● Content type: both static and dynamic (i.e. interactive or animated). Time-based modifications to the elements can be described in SMIL (Synchronized Multimedia Integration Language), or can be programmed in a scripting language (e.g., ECMAScript or JavaScript).

• Also well-suited to small and mobile devices. SVG Mobile Recommendation: SVG Basic, SVG Tiny (simplified profiles of SVG 1.1).
Supported on mobile devices from Motorola, Samsung, Nokia, Sony ericsson, LG, Apple's iPhone and Siemens.

● Current Recommendation : Version 1.1
W3C Working Draft : Version 1.2



SVG: Software and support in applications

• Inkscape :-)

• Batik: pure JAVA library to render, generate, and manipulate SVG graphics by IBM

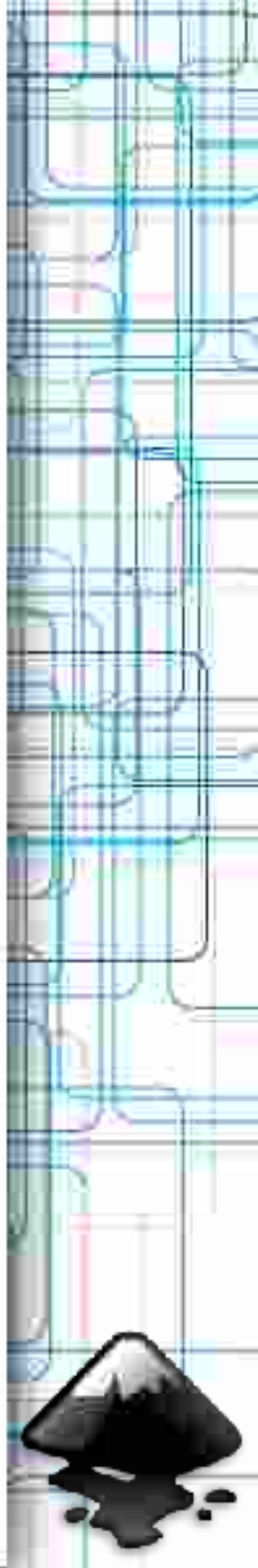
• Adobe SVG viewer plugin

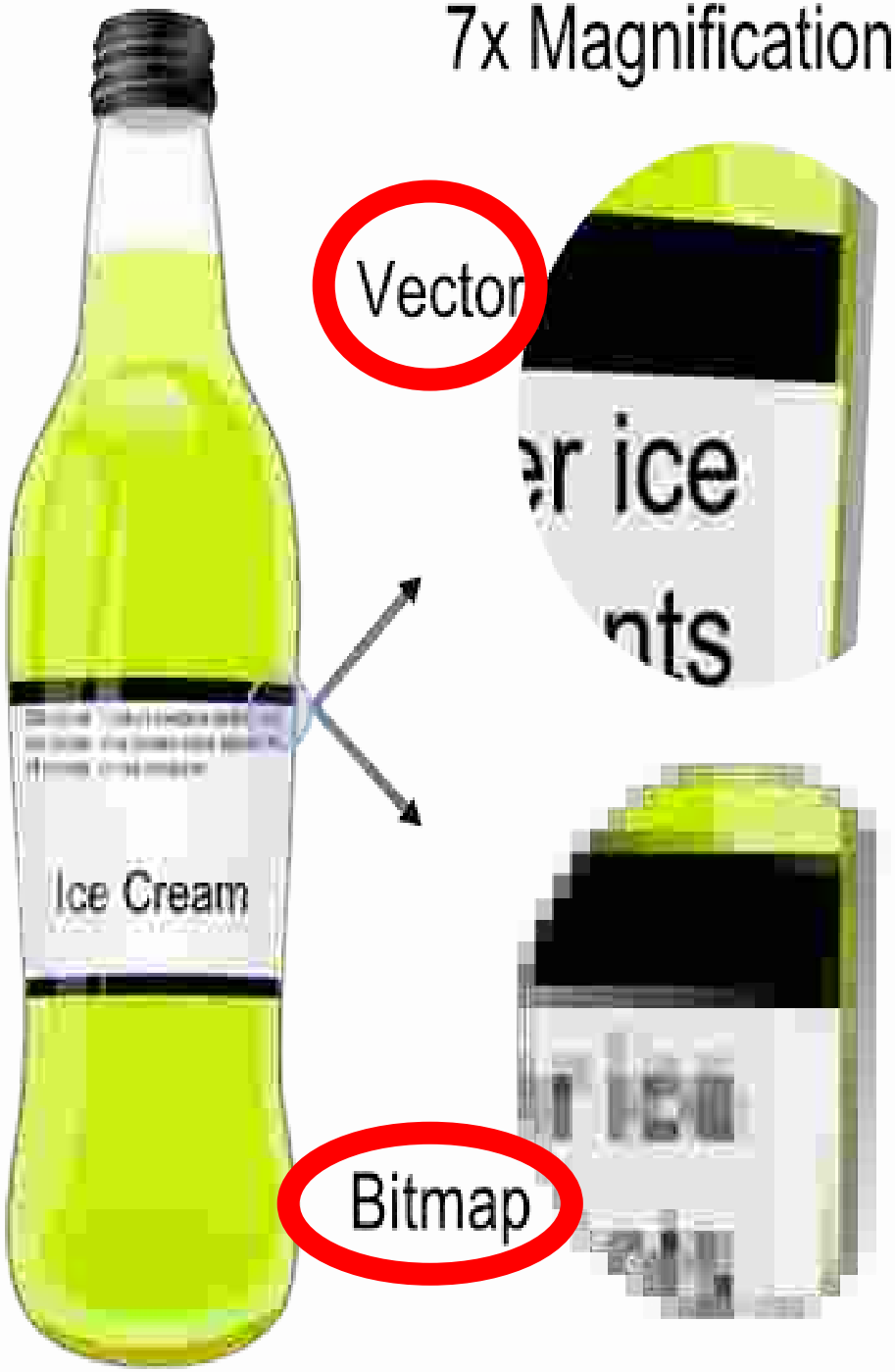
•Most of these have atleast import/export support for SVG
- Blender
- Adobe Illustrator
- Corel Draw
- Microsoft Visio
- Xara Xtreme

•Web browsers: Opera, Amaya, Safari, Chrome, Firefox etc. have atleast partial support

Vector v/s Raster graphics

Raster Graphics	Vector Graphics
1. Resolution dependent. They cannot scale up to an arbitrary resolution without loss of apparent quality.	1. Resolution-independent description of shapes and objects.
2. A data structure representing grid of pixels, or points of color.	2. Uses geometrical primitives (based on mathematical equations) to represent images in computer graphics.
3. Scale with loss of clarity and quality.	3. Indefinite scaling without degrading.
4. Useful for photographs and artistic drawings.	4. Useful for design compositions, logos, images with text etc.

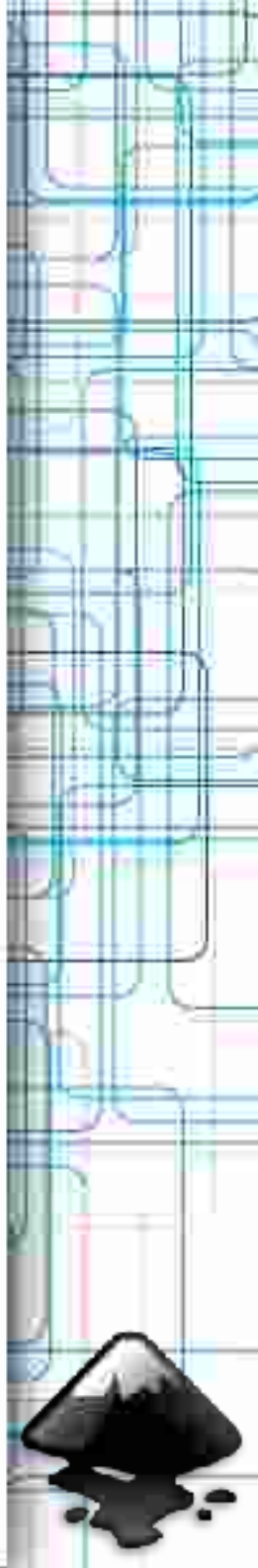



7x Magnification
Vector
Ice Cream
Bitmap

Which is better? Inkscape or Photoshop?

Are you still confused ?

Raster Graphics Editor Applications	Vector Graphics Editor Applications
Adobe Photoshop	INKSCAPE :-)
Adobe Fireworks	Openoffice.org Draw
Corel Painter	Scribus
Microsoft Paint	Adobe Illuatrator
Apple iPhoto	CorelDraw
Google Picasa	Adobe Freehand
GIMP	Microsoft Visio



Showcase

Inkscapers are finding this tool useful for a wide variety of purposes:

Branding

Icons

Web-design

Web-graphics

Web mockups

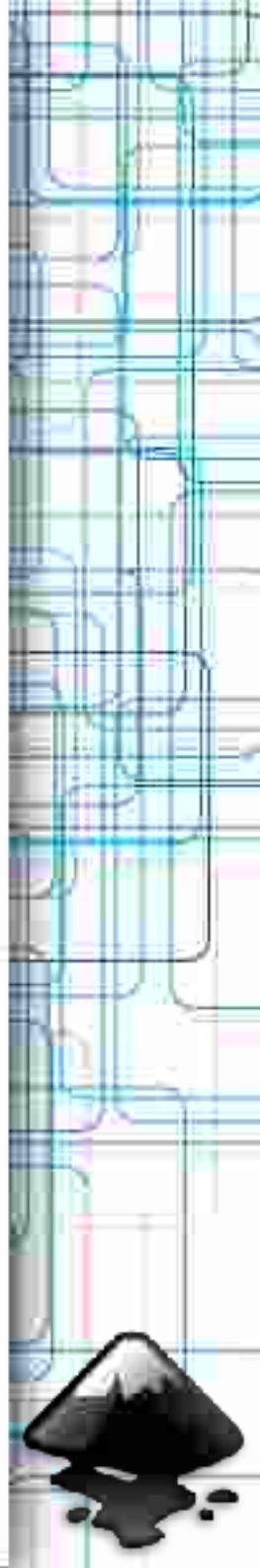
CD-booklet

Game maps

Technical diagrams

Creative art

Photorealism

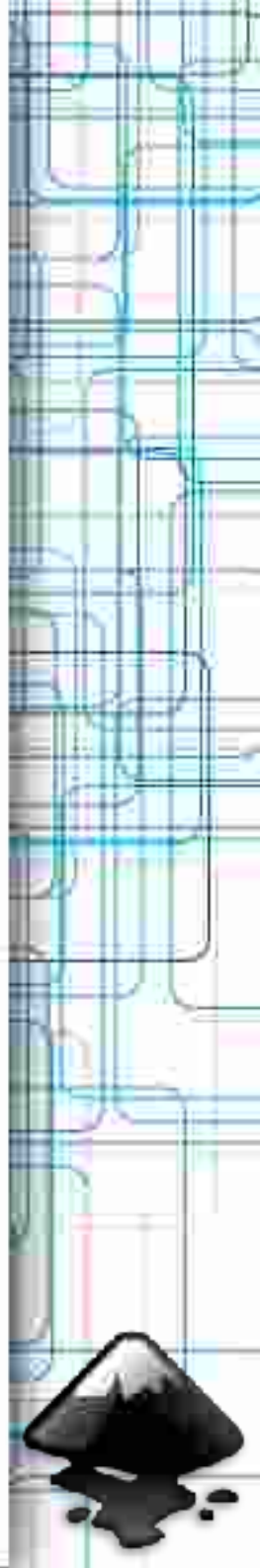


Inkscape: Basics

- Creating and managing documents:
  New (Ctrl+N), Open (Ctrl+O), Save (Ctrl+S)
  Navigate documents (ALT+TAB or CTRL+TAB)

- Panning the canvas
  Keyboard (CTRL+arrow_keys)
  Mouse (wheel or SHIFT+wheel)
  etc.

- Zooming in or out:
  Keyboard (+ or -)
  Mouse (CTRL+wheel)
  “Zoom in or out” tool in Inkscape toolbox
  etc.



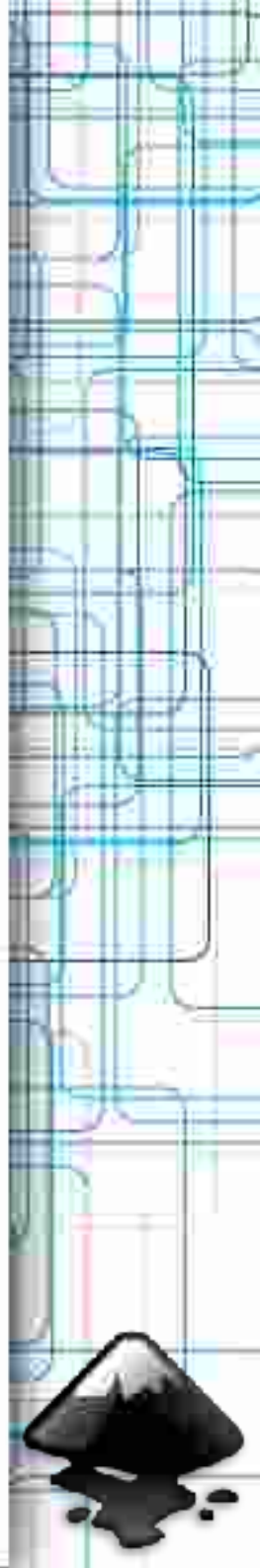
Inkscape: Shapes

- Four versatile shape tools:
  Rectangle, Ellipse, Star, Spiral

- Diamond-shaped handles for immediate editing or in 'Node' tool
  Tool Controls bar to modify/reset tool parameters

- Changes made to the Tool parameters are remembered

- Selecting shapes:
  Click
  SHIFT+Click (select in group)
  ESC (deselect)



Shape: Rectangle (F4)

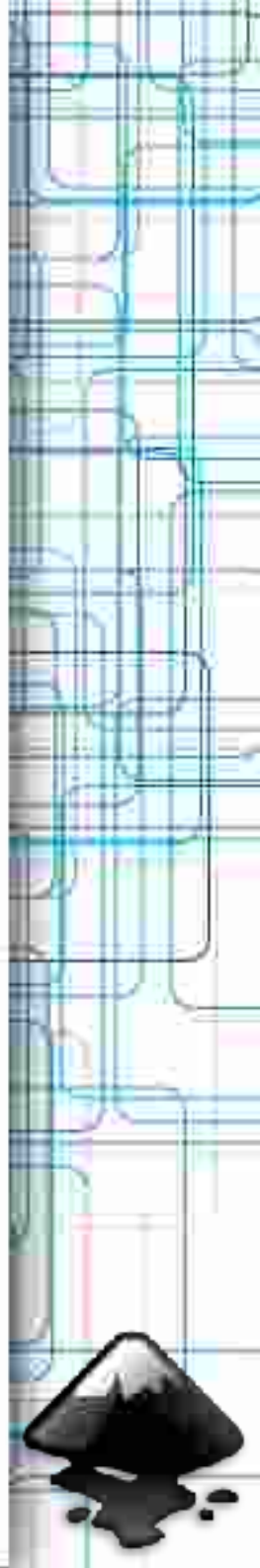
- Rectangle tool (F4)

- With Ctrl, draw a square or an integer-ratio (2:1, 3:1, etc) rectangle.

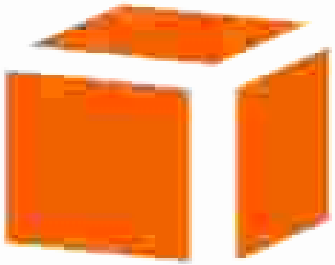
- With Shift, draw around the starting point as center.

- Rounding handles

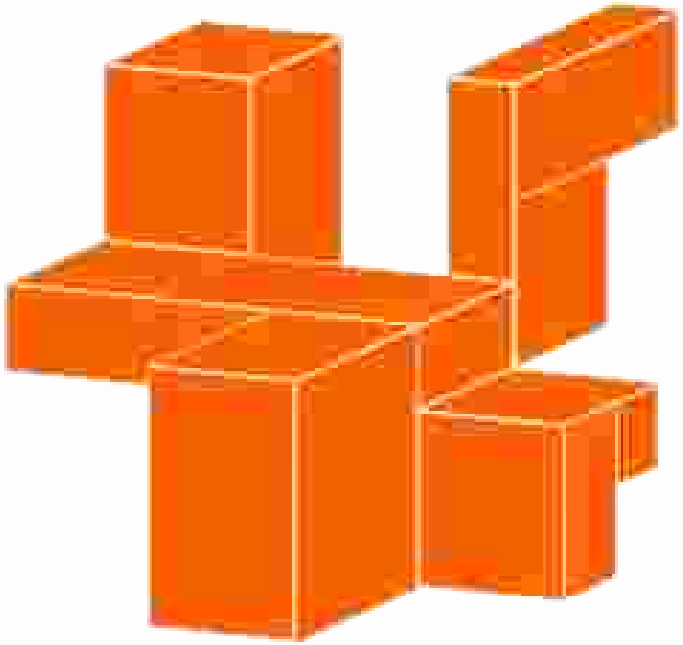
  Resize handles (notion of horizontal and vertical along rectangle sides. With CTRL, resize handles preserves either width, or height, or the width/height ratio



Rectangle: Example 2D/3D compositions



3 original rectangles

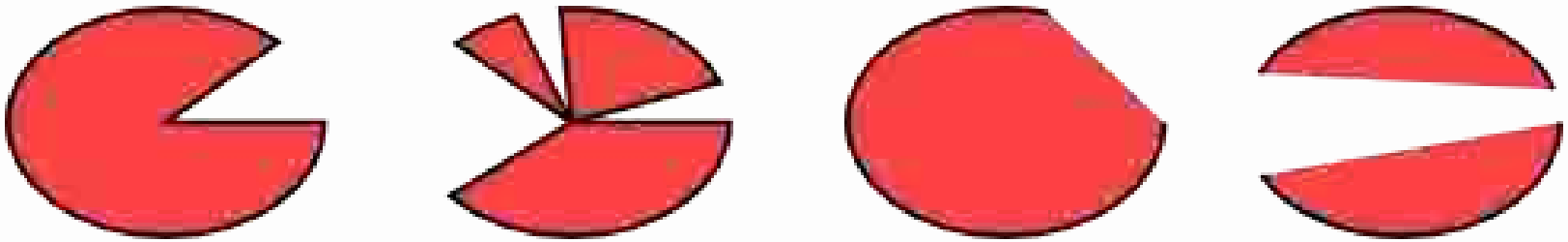


Several rectangles copied and resized by handles, mostly with Ctrl

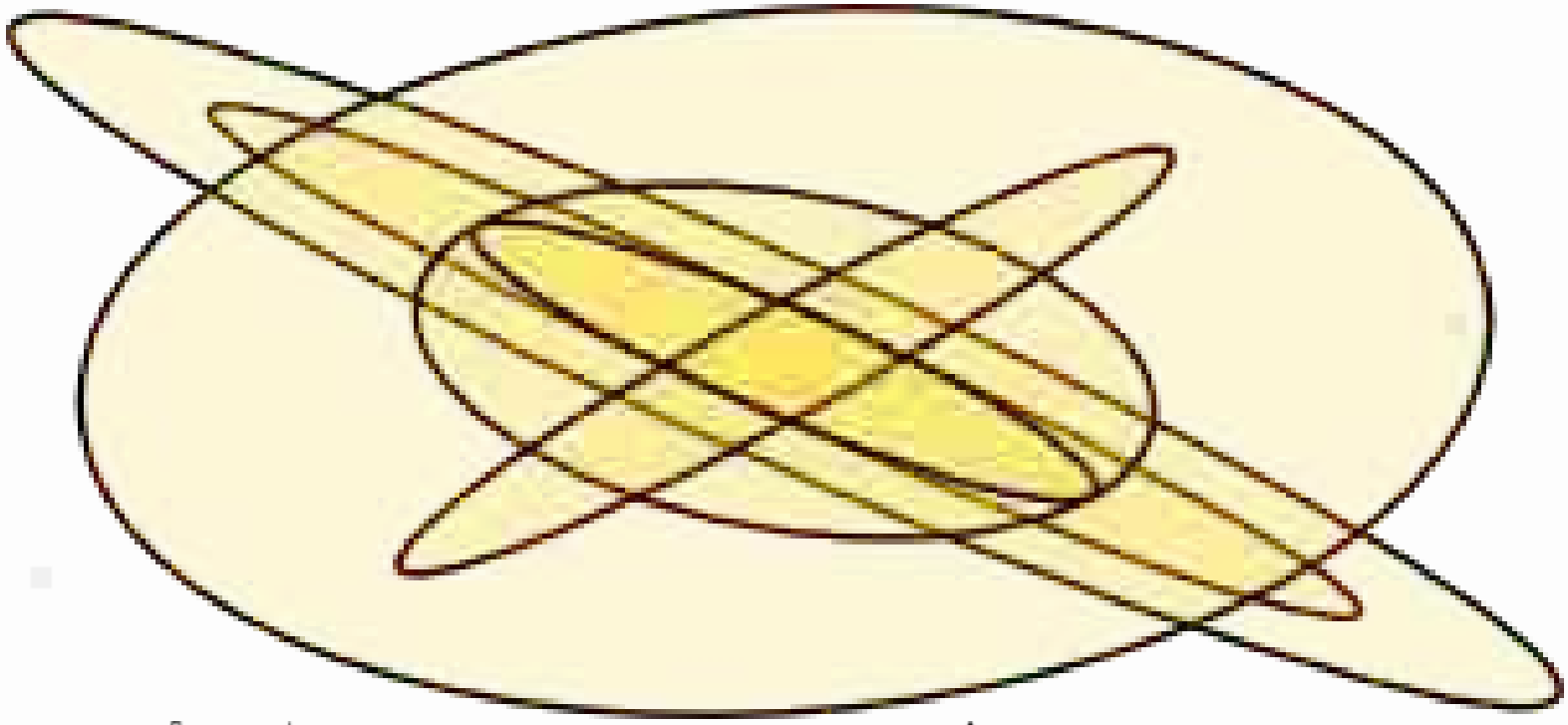
Shape: Ellipse

- Used for ellipses, circles, segments, arcs
- Ellipse tool (F5)
- With Ctrl, draw a circle or an integer-ratio (2:1, 3:1, etc.) ellipse.
- With Shift, draw around the starting point as center.
- Resize handles

  Segments or arcs handles

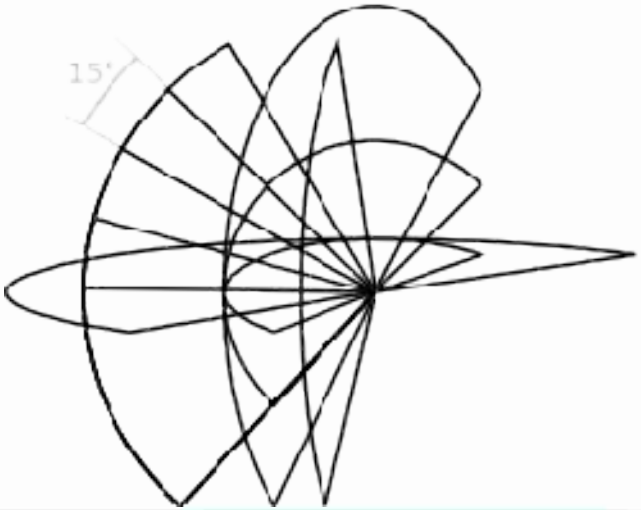


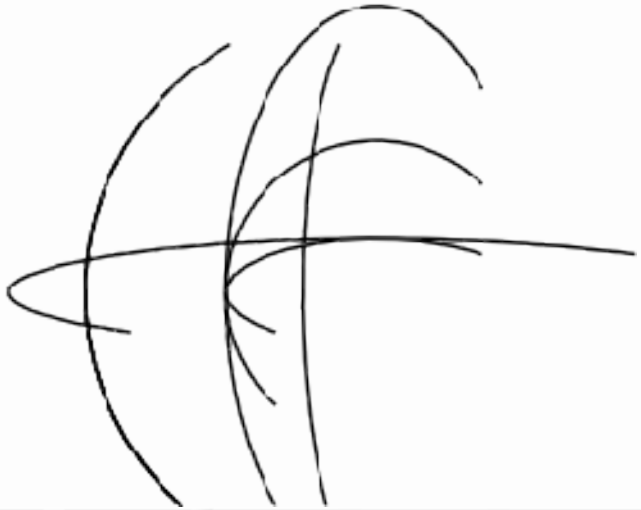
Ellipse: Example compositions



Segments

Arcs





Shape: Stars

- Star tool (SHIFT+F9)

- Most complex and most exciting Inkscape shape.

- Creates two similar but distinct kinds of objects: stars and polygons

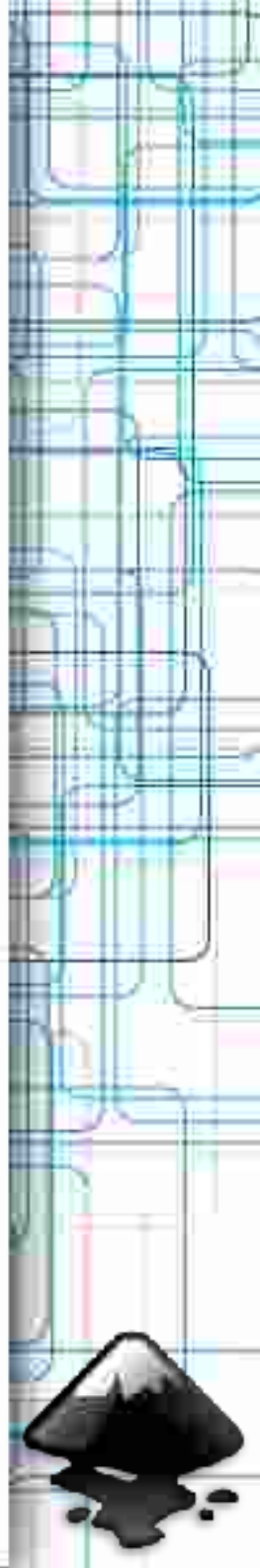
- Handles in star:
  The first handle on a vertex, i.e. on a convex corner of the star makes the star rays longer or shorter. Cannot skew the star's rays with this handle.

  The other handle on a concave corner between two vertices) is free to move both radially and tangentially, without affecting the vertex handle.

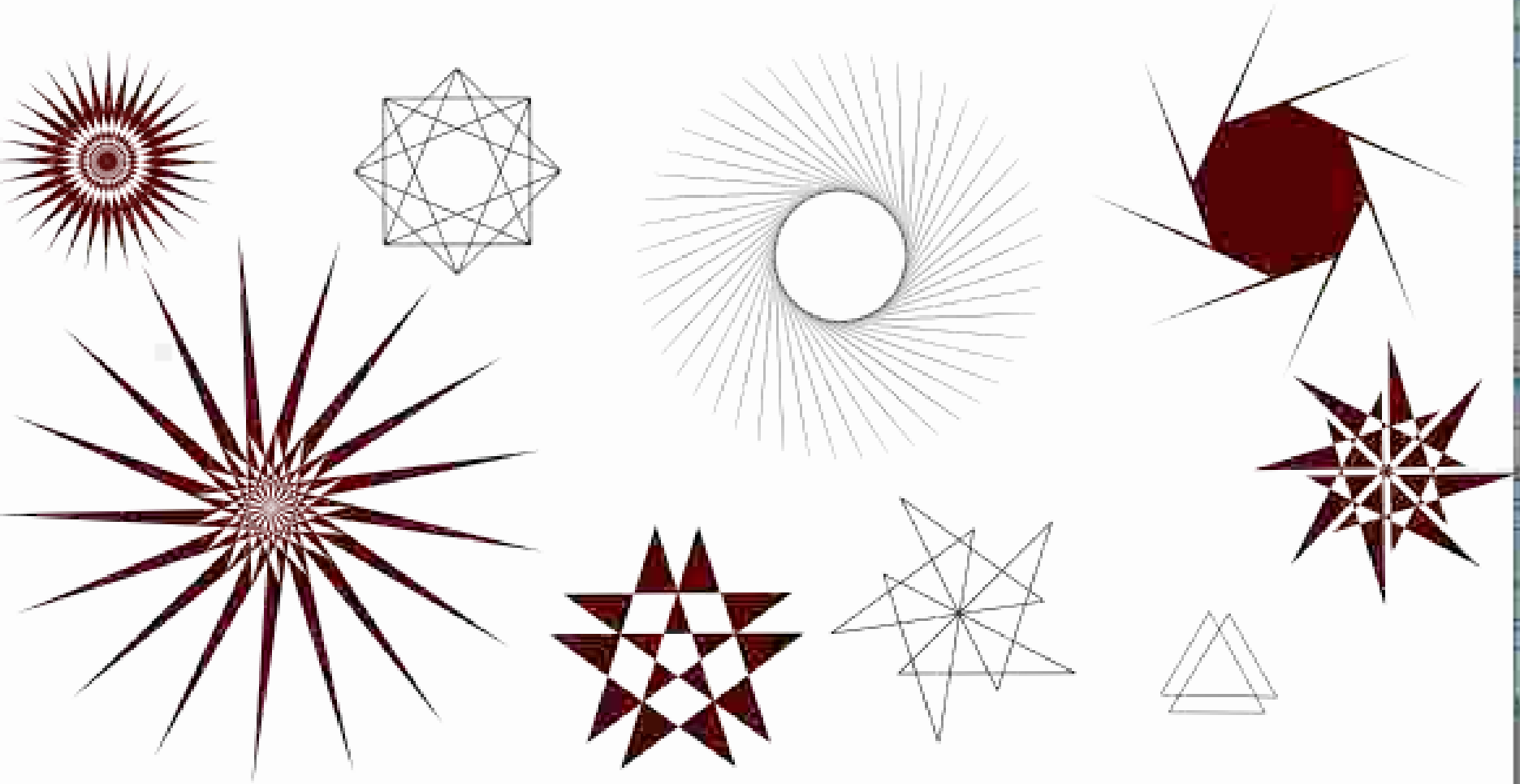
- Handles in polygon:
  Used for resizing and rotation.

- Range of number of vertices: 3 to 1024

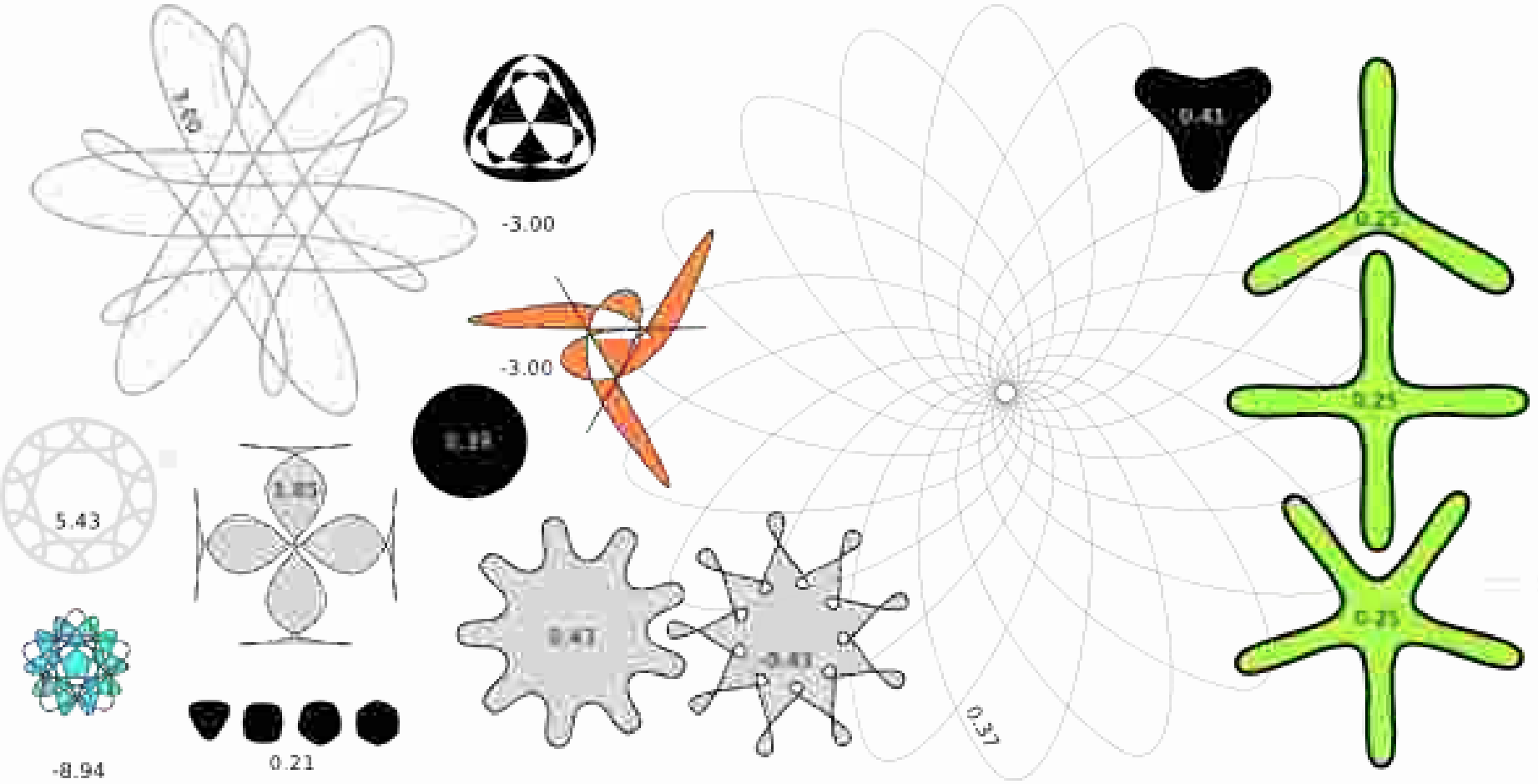
- Setting parameters in Star Tool Control Bar creates beautiful, intricate, and totally unpredictable patterns. Result: endless entertainment that is outright addictive.



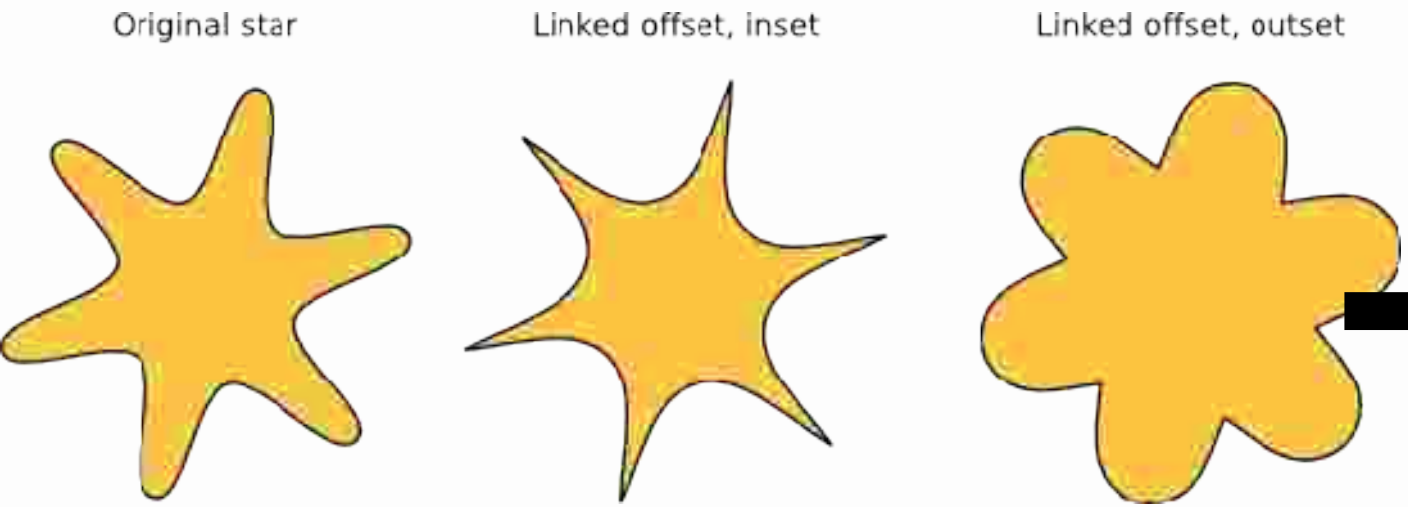
Star: Example compositions



Isn't this cool stuff ?

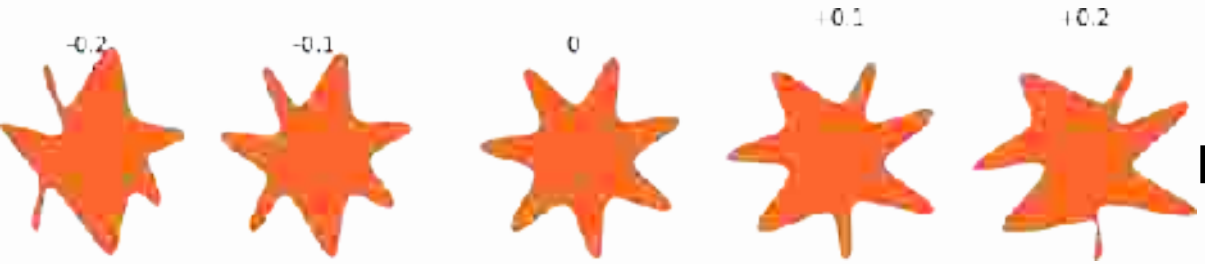


Star: Other Example compositions



Using Offsets
(CTRL+J)

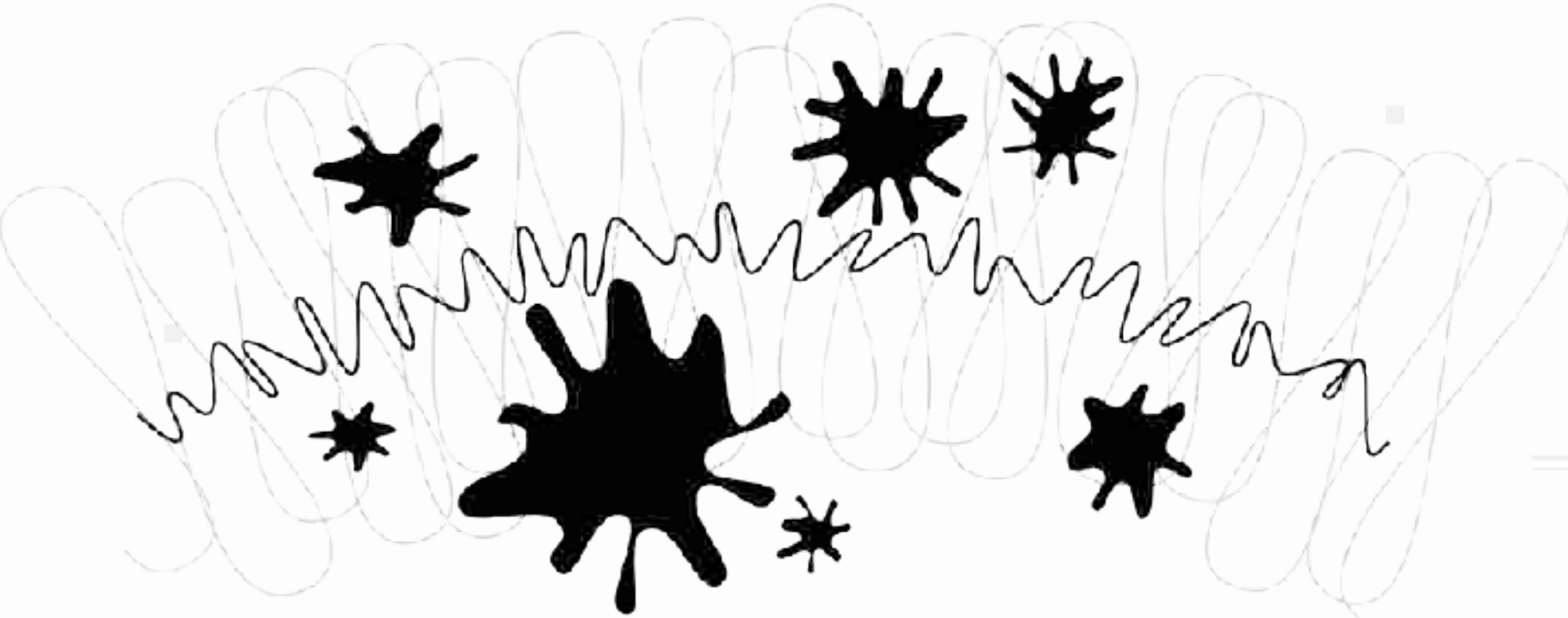
Re-randomized:
randomization
level is 0.1



Re-randomized:
randomization
level varying from
-0.2 to 0.2

Rounded amoeba-like blotches and large roughened planets with fantastic landscapes

:-)



Shape: Spirals

- Spiral tool (F9)

- Roll and Unroll handles

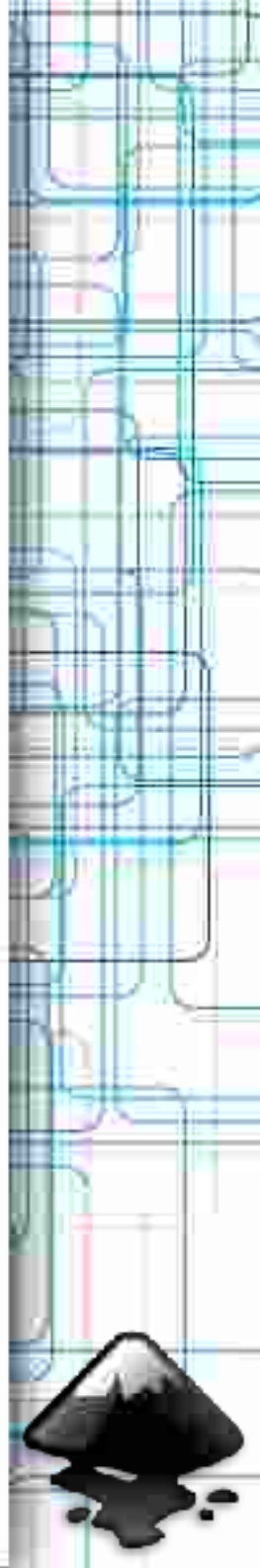
  Shift+drag outer handle to scale/rotate around center (no rolling/unrolling).

- Divergence: the measure of nonlinearity of its winds
  divergence = 1 → Uniform spiral

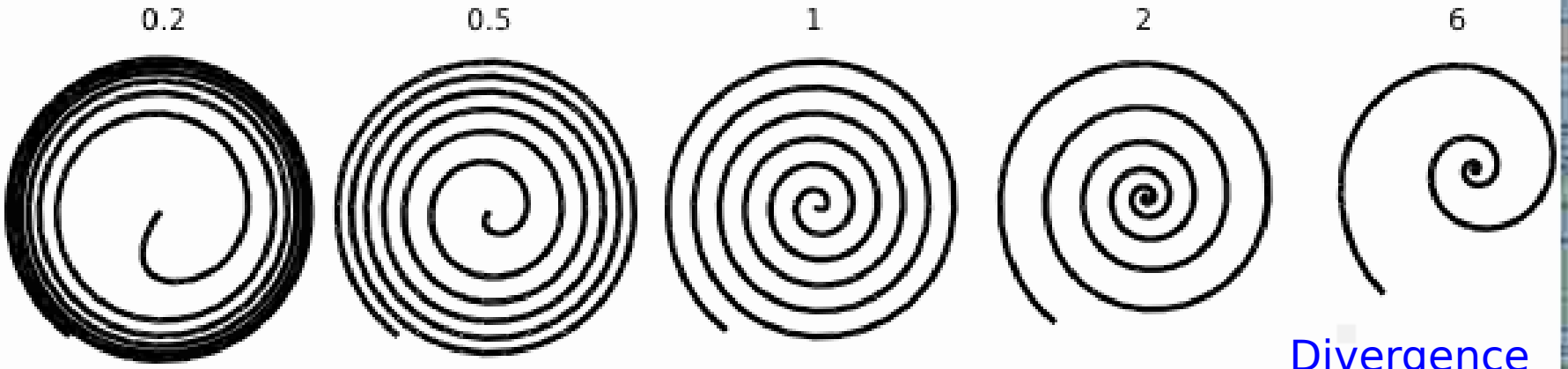
  divergence < 1 → Spiral is denser on the periphery

  divergence > 1 → Spiral is denser towards the center

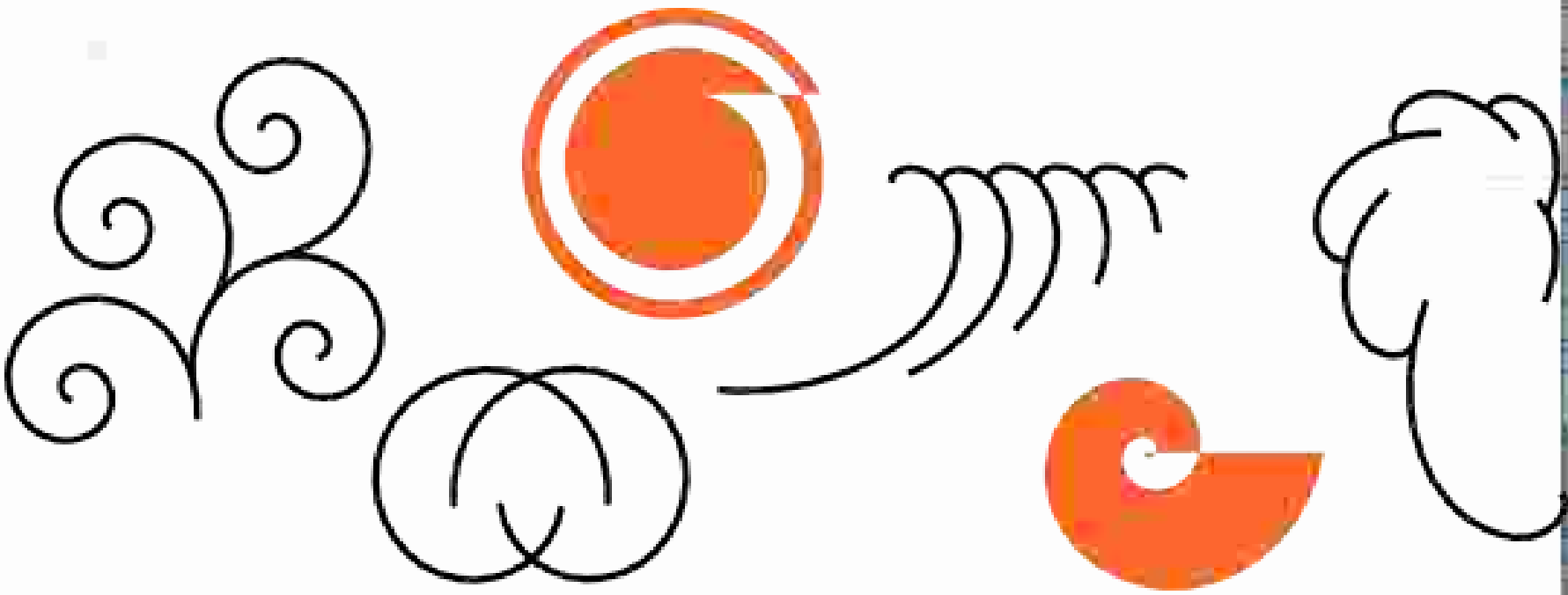
- Maximum number of spiral turns = 1024



Spirals: Example compositions

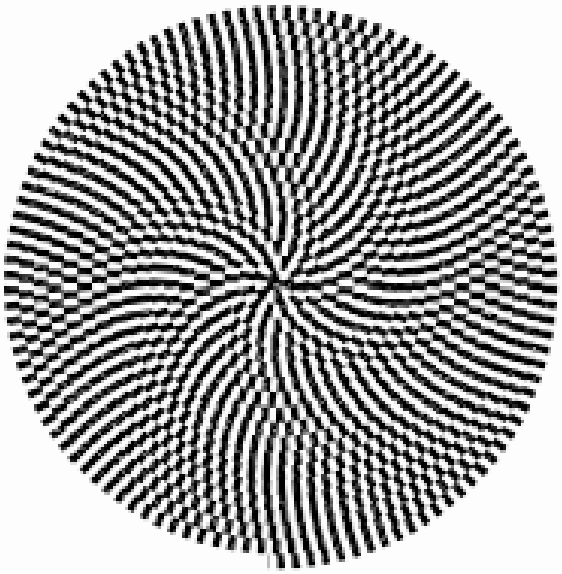


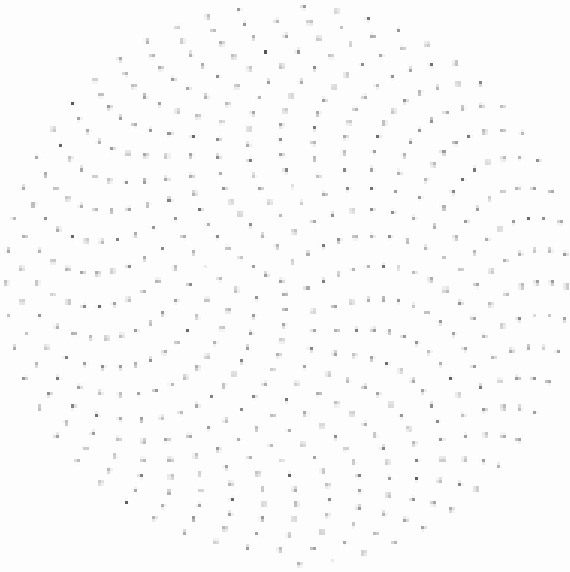
Divergence

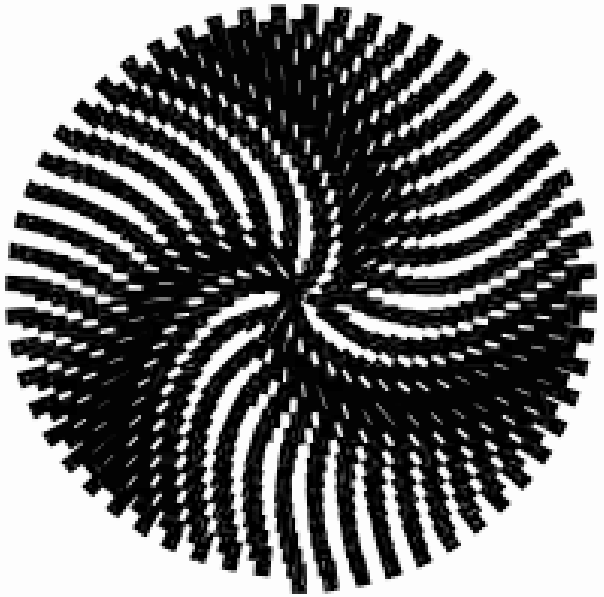


Using fills and strokes with spirals

Spirals: Example compositions







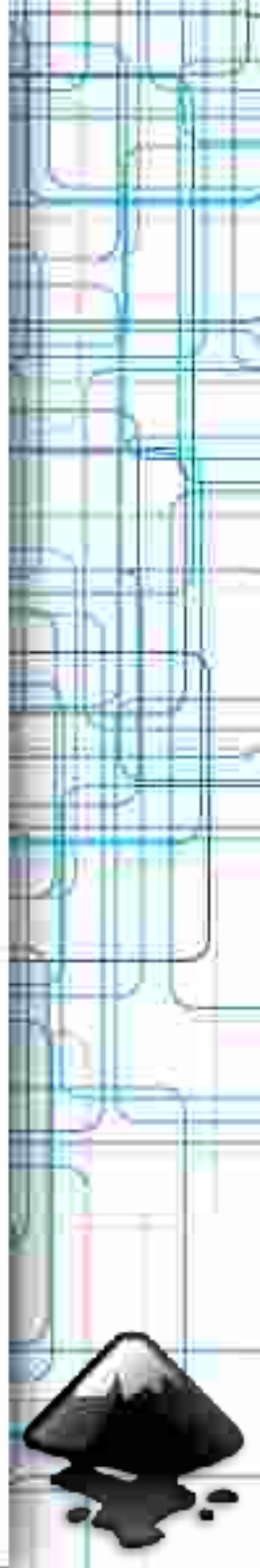
Dotted strokes and spirals

Inkscape :Calligraphy

- History & style :

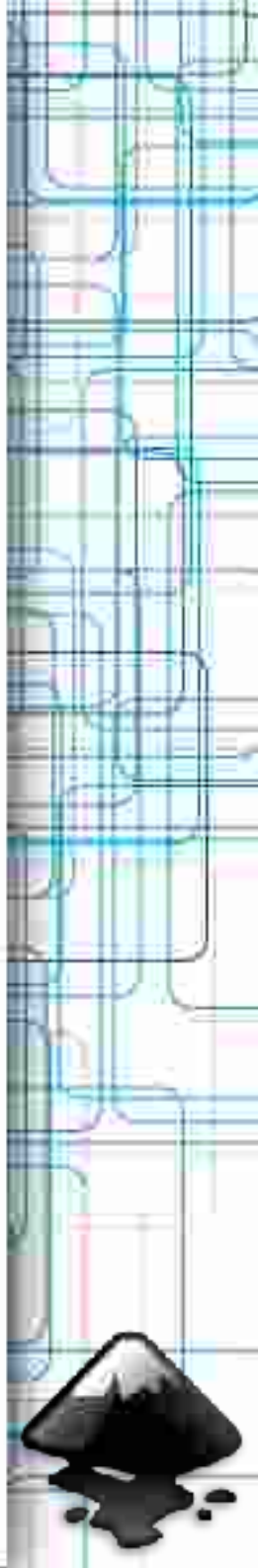
  Going by the dictionary definition, calligraphy means “beautiful writing” or “fair or elegant penmanship”.

- There are three main styles of calligraphy:
- *Western or Roman*
- *Arabic*
- *Chinese or Oriental*



Calligraphy continued...

- This tutorial focuses mainly on Western calligraphy, as the other two styles tend to use a brush (instead of a pen with nib)
- Switch to the Calligraphy tool by pressing Ctrl+F6, pressing the C key, or by clicking on its toolbar button. On the top toolbar, you will notice there are options such as :
- *Width & Thinning;*
- *Angle & Fixation;*
- *Caps;*
- *Tremor,*
- *Wiggle & Mass..*



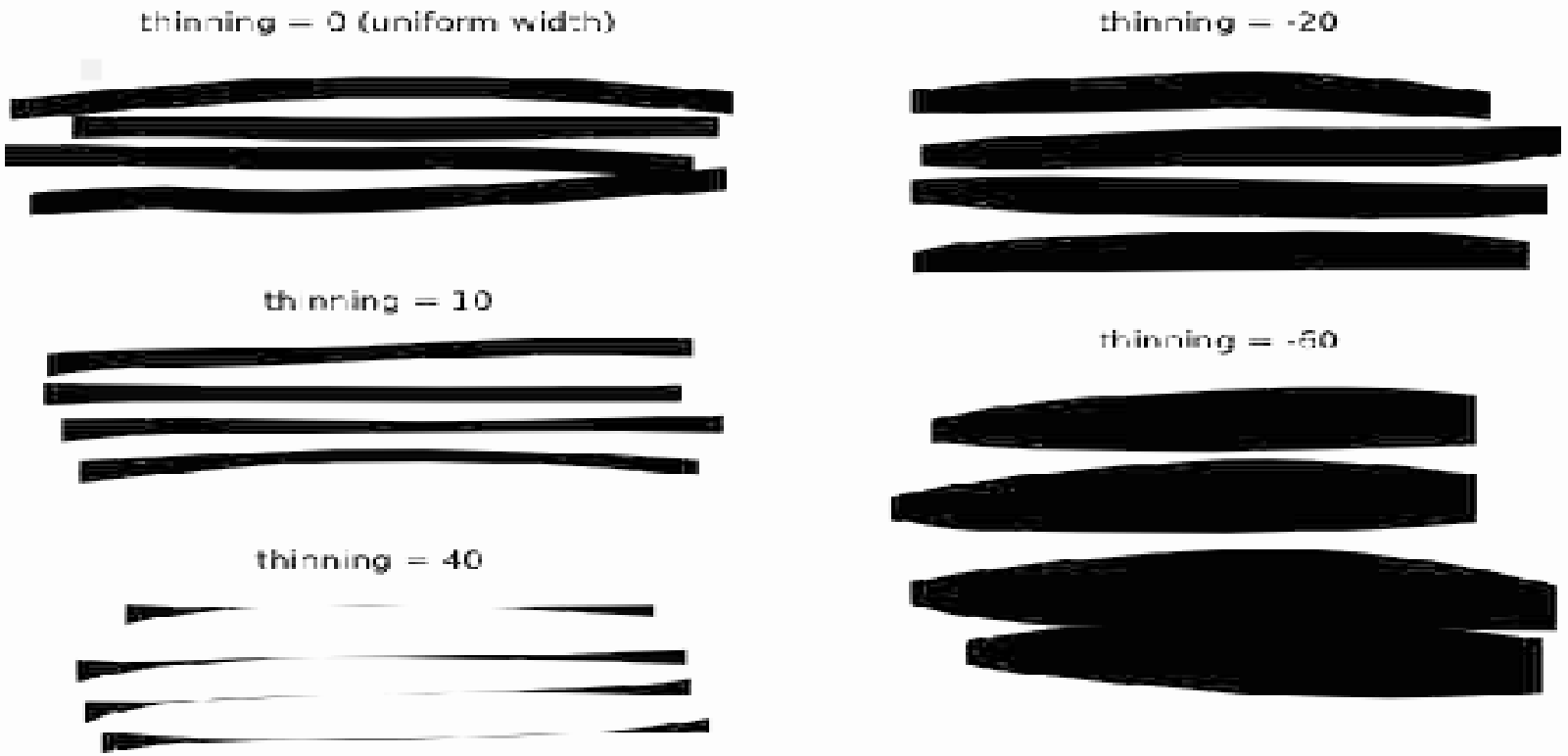
Calligraphy continued...

Width & Thinning:

This pair of options control the width of your pen. The width can vary from 1 to 100.

Calligraphy continued...

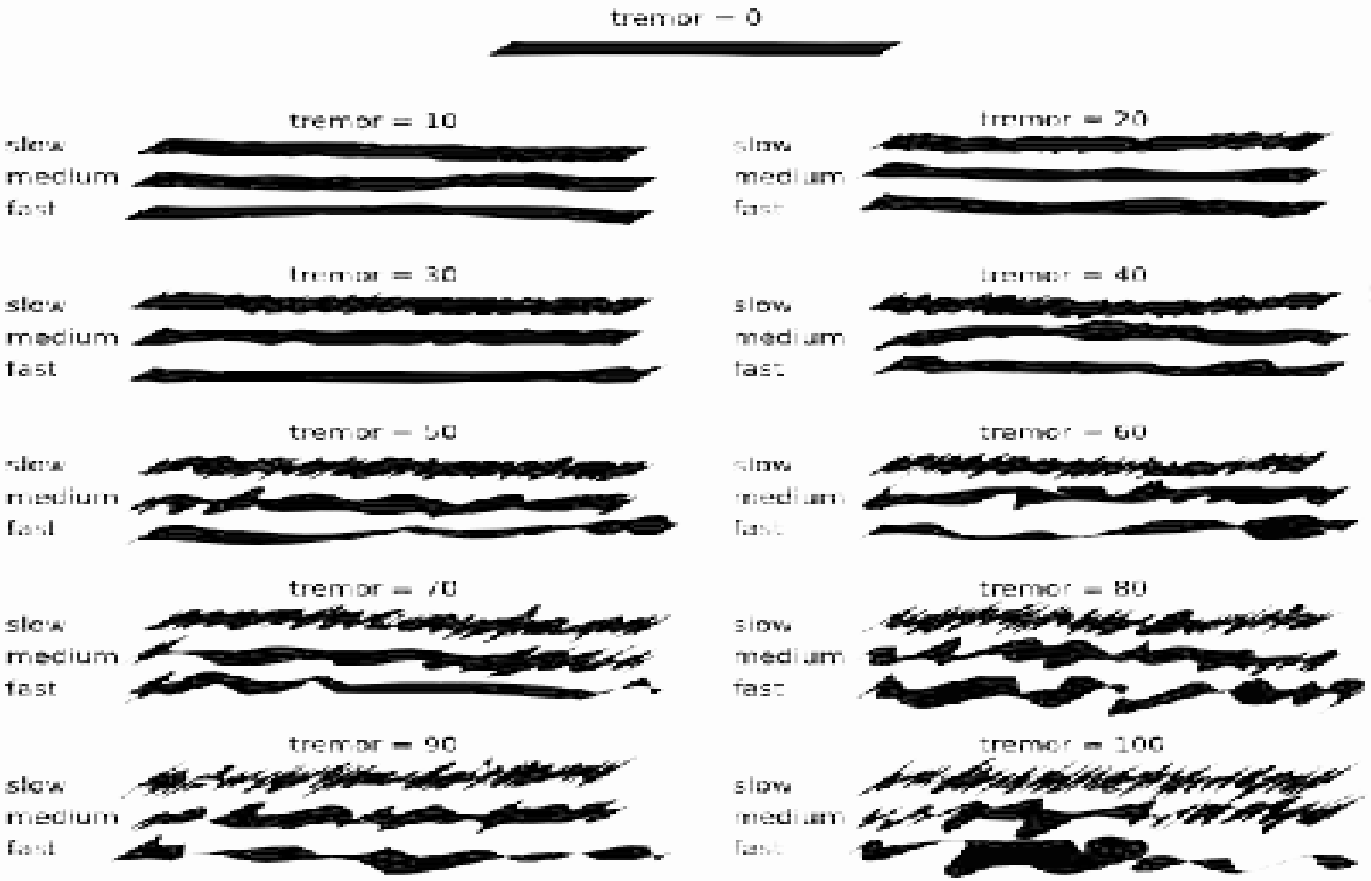
Pen width may also depend on the velocity, as controlled by the thinning parameter. This parameter can take values from -100 to 100; zero means the width is independent of velocity, positive values make faster strokes thinner, negative values make faster strokes broader. The default of 0.1 means moderate thinning of fast strokes.



Calligraphy continued...

Tremor

Tremor is intended to give a more natural look to the calligraphy strokes. Tremor is adjustable in the Controls bar with values ranging from 0.0 to 1.0. It will affect your strokes producing anything from slight unevenness to wild blotches and splotches.

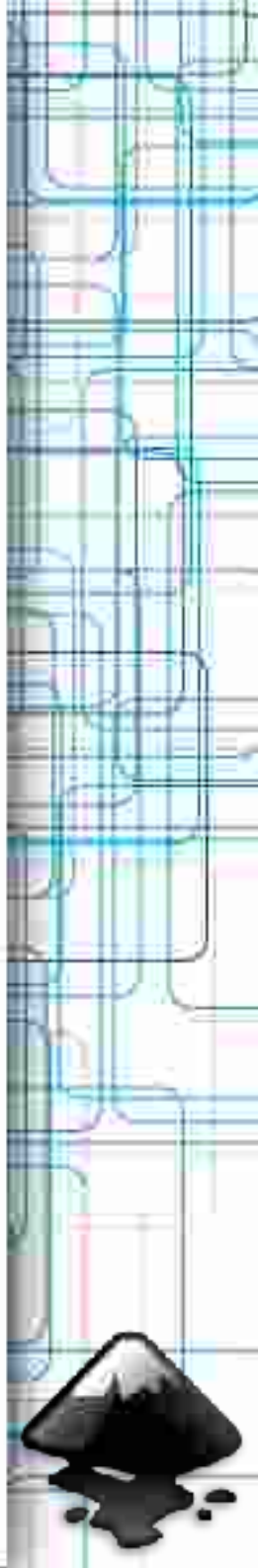


Calligraphy continued...

Wiggle & Mass

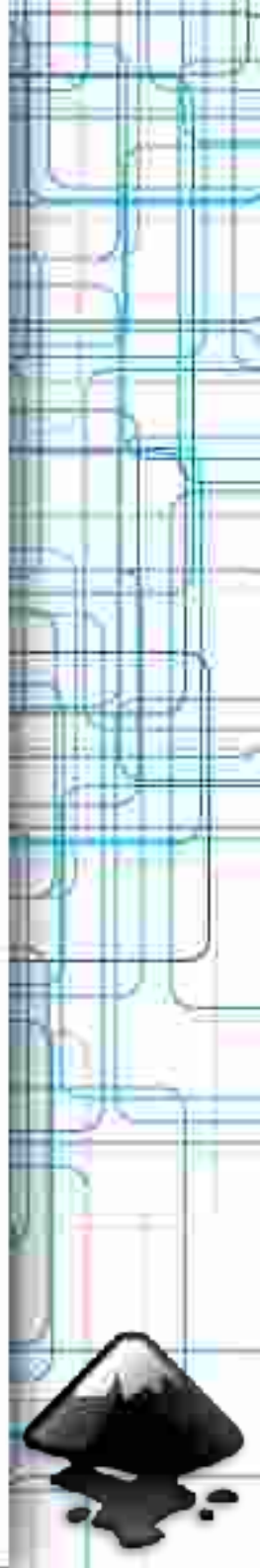
Wiggle is the resistance of the paper to the movement of the pen. The default is at minimum (0), and increasing this parameter makes paper “slippery”.

In physics, mass is what causes inertia; the higher the mass of the Inkscape calligraphy tool, the more it lags behind your mouse pointer and the more it smoothes out sharp turns and quick jerks in your stroke.



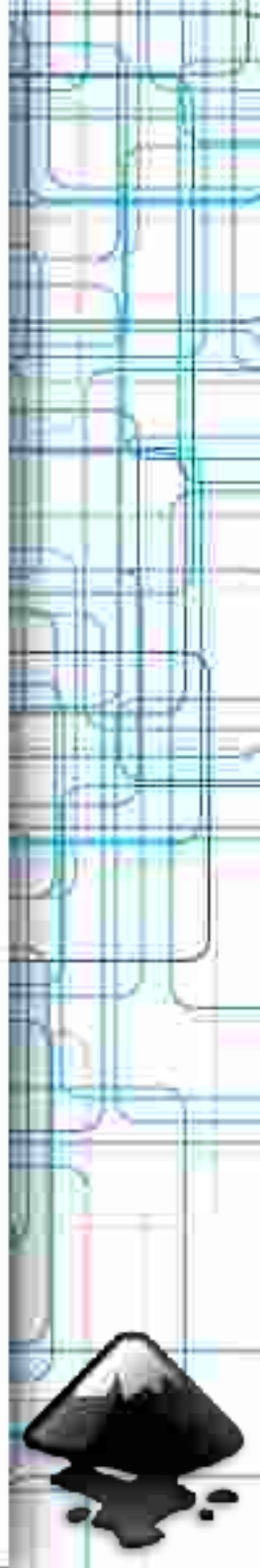
Conclusion :

Calligraphy is not only fun; it's a deeply spiritual art that may transform your outlook on everything you do and see.



Other tools

- Create 3D boxes
- Draw freehand lines
- Draw bezier curves and straight lines
- Erase existing paths
- Fill bounded areas
- Create and edit text objects
- Create diagram connectors
- Create and edit gradients
- Dropper
- Edit paths by nodes
- Tweak objects by sculpting or painting

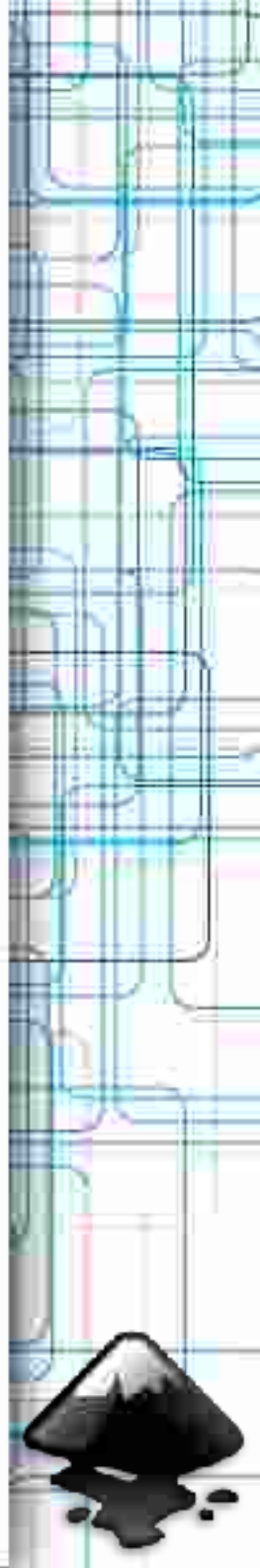


Selecting objects in Inkscape

- 'Select and transform objects' tool

- Multiple selections:
  - Use SHIFT+click
  - Rubberband selection: drag around the objects you need to select

- ESC deselects any selected objects

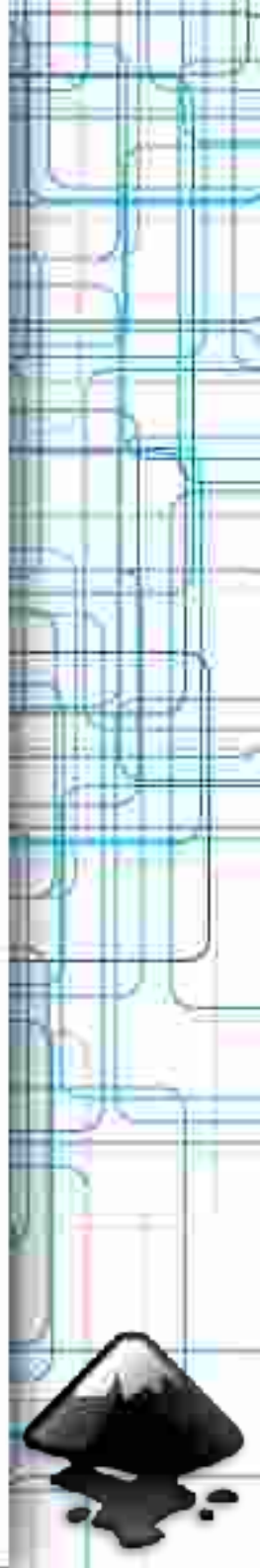


Trasformations using inkscape

• 'Select and transform objects' tool
NOTE: Using ALT with this tool, restricts/preserves some property in different transformations.

• Moving
Arrow keys
• Scaling
< or >
• Rotating
[or]
• Skewing/Shearing

• Transform dialog (Object ---> transform) can be used for precise transformation.

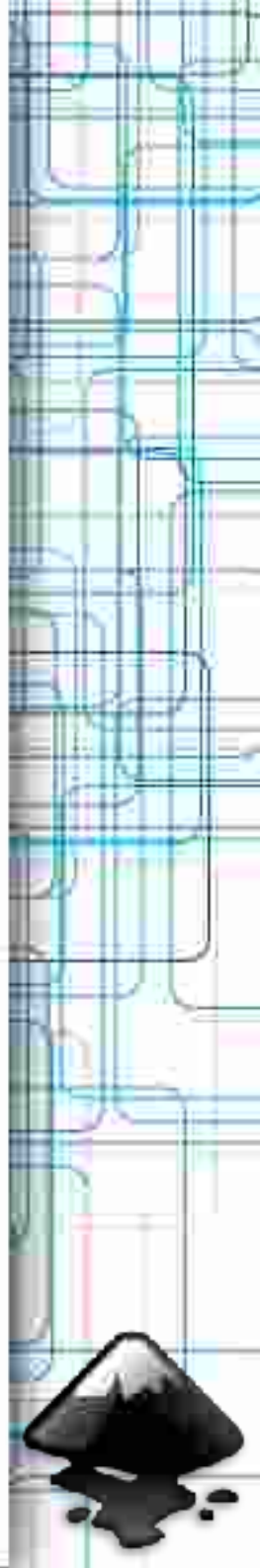


Other important features in Inkscape

- Grouping:
  CTRL+G – Group objects
  CTRL+U – Ungroup a group
  CTRL+click - select/edit an object within a group

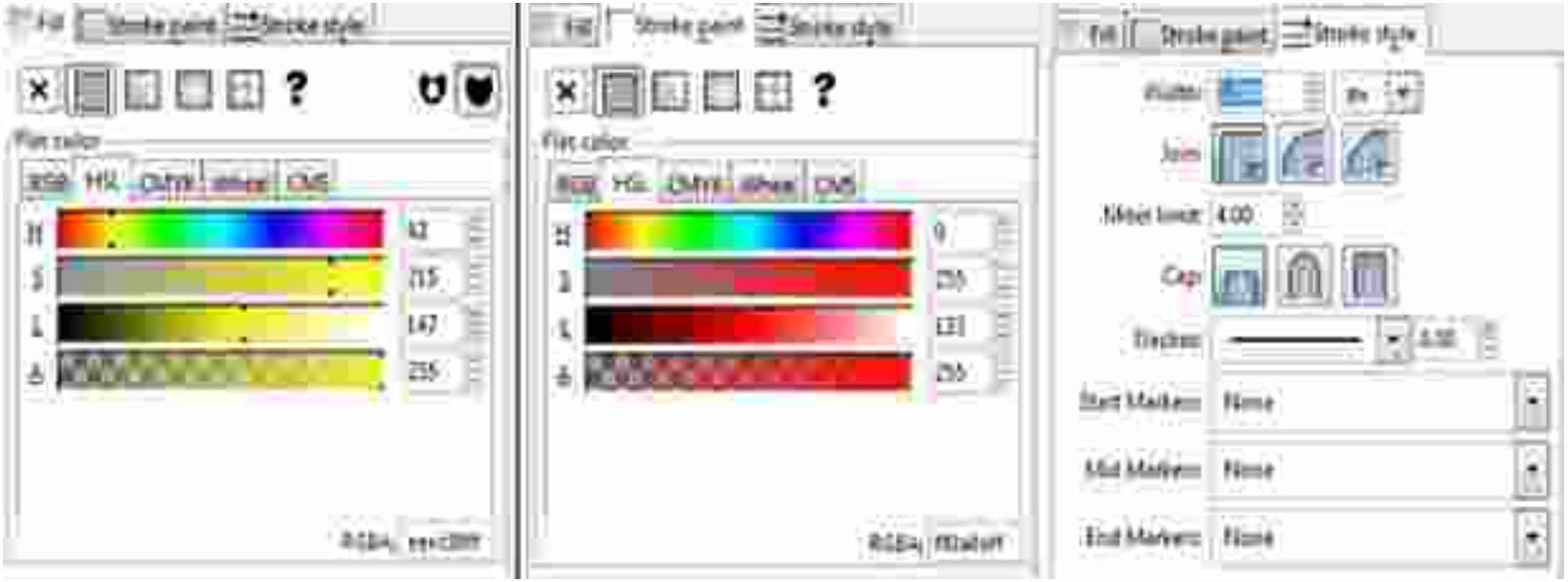
- Z-order: stacking order of objects in a drawing
  - Raise to Top: Home
  - Lower to Bottom: End
  - Raise selection one step only: PageUp
  - Lower selection one step only: PageDown

- Duplicating objects: CTRL+D



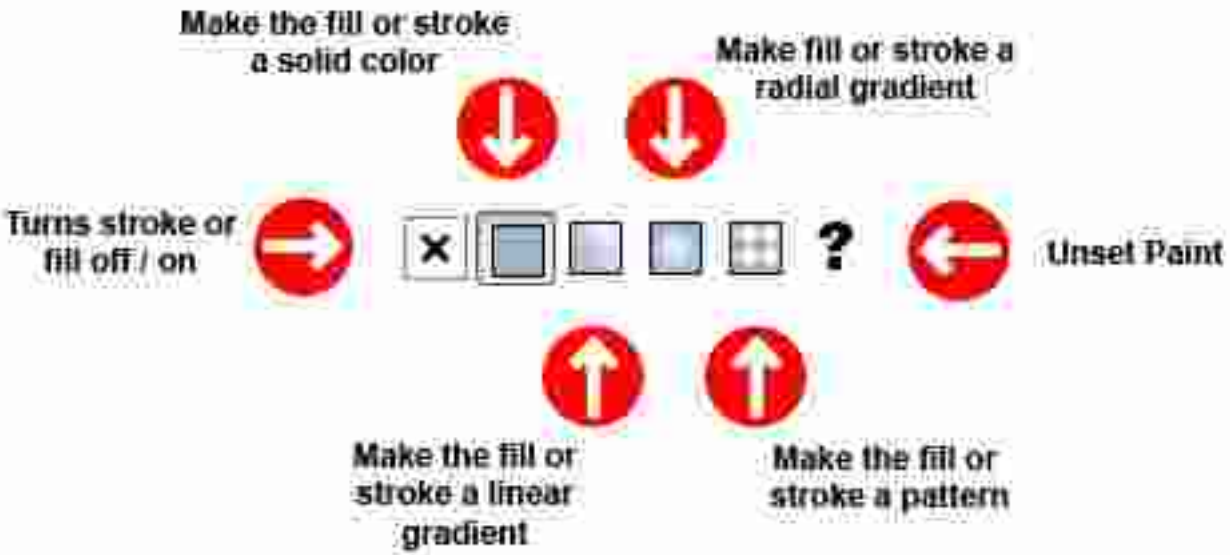
Inkscape : Fill & stroke

Every object you draw in Inkscape has two parts: a fill and a stroke. The stroke is the outer boundary of the object. The fill is the object's inner, or main color.



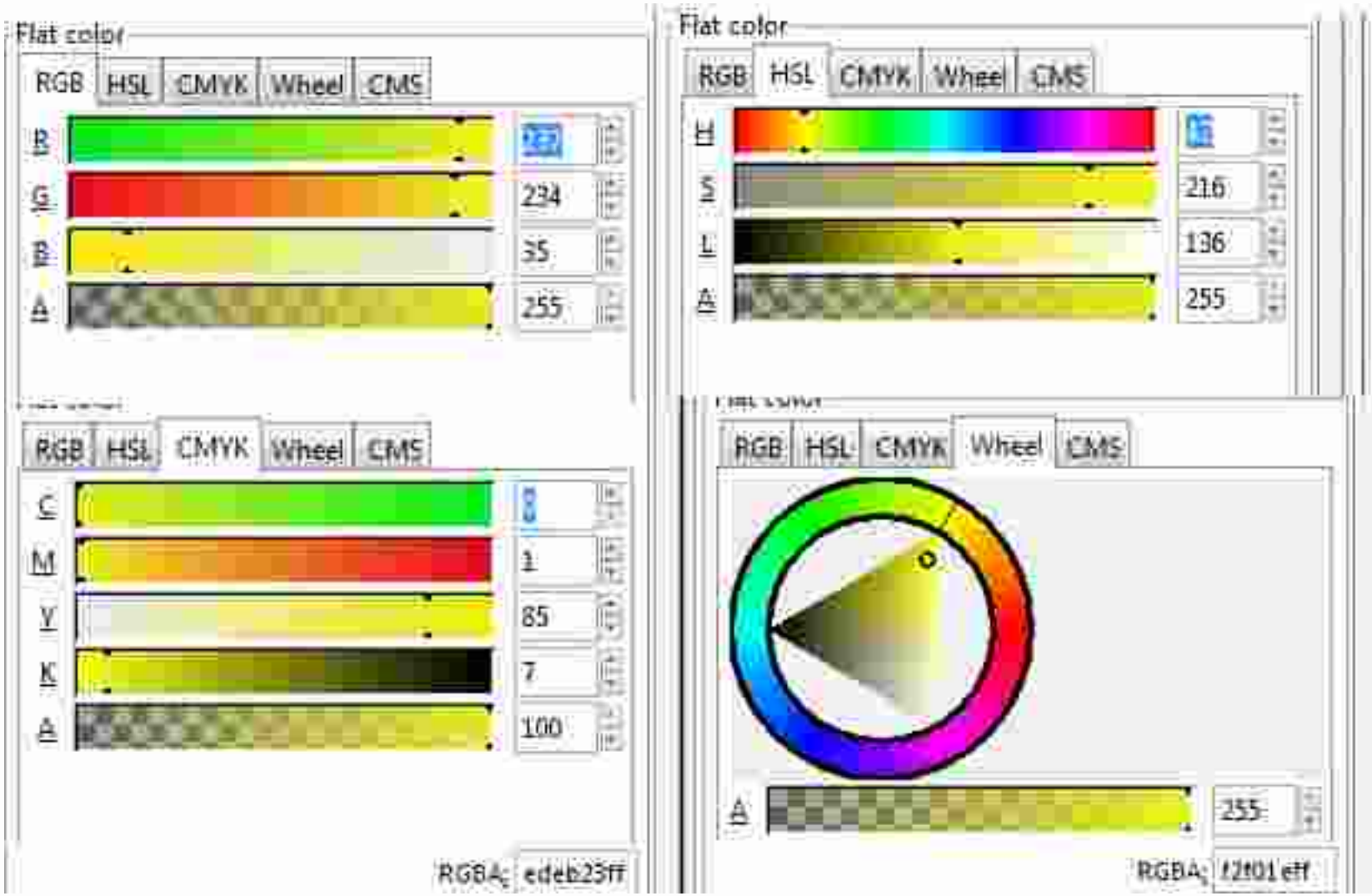
Fill and Stroke continued...

The options on the fill and stroke paint tabs are almost identical, so let’s take a quick look at the row of buttons in the top-left of the color manager



Fill and Stroke continued...

Color tabs

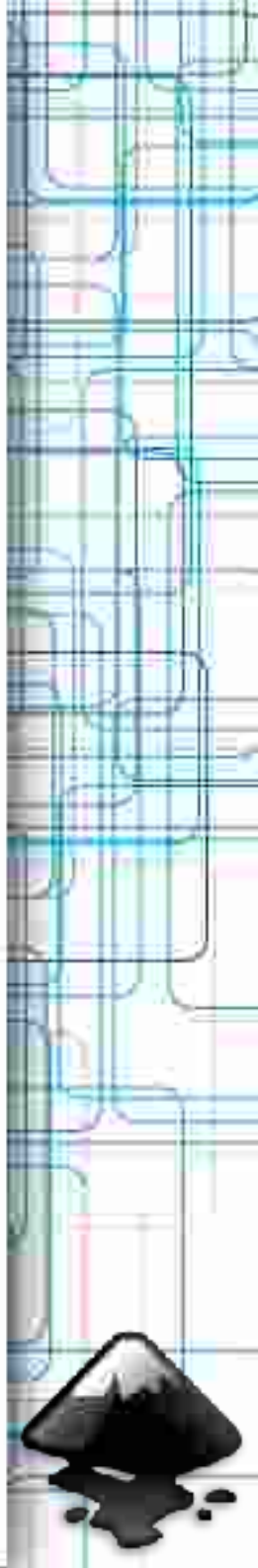


Fill and Stroke continued...

The RGB tab – RGB stands for “Red Green Blue”. It’s called such because it creates colors by blending various gradations of – you guessed it – red, green and blue to achieve the desired color. The RGB palette is a bit limited, and is almost always used exclusively for web graphics. If you’re designing buttons for the web, you should probably be working with the RGB palette. The “A” Slider stands for “Alpha”, a.k.a. opacity. this determines how transparent or opaque your color is.

HSL Color - HSL stands for “Hue, Saturation, Lightness”.

CMYK Color – If you are designing for print, brochures or magazines, you should be working with the CMYK palette. CMYK stands for “Cyan, Magenta, Yellow and Key [Black]“, and is the standard palette for many types of printing presses.

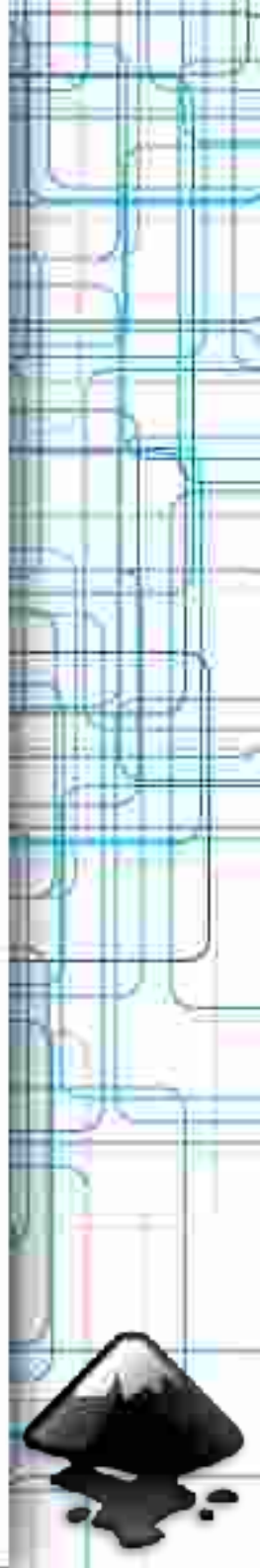


Fill and Stroke continued...

Wheel – If you find the sliders hard to use, or you are employing a color theory that is based on angles, you might prefer using the Wheel. It's a bit more visually-oriented.

CMS – The CMS is Color Management System

- Blur
- Opacity



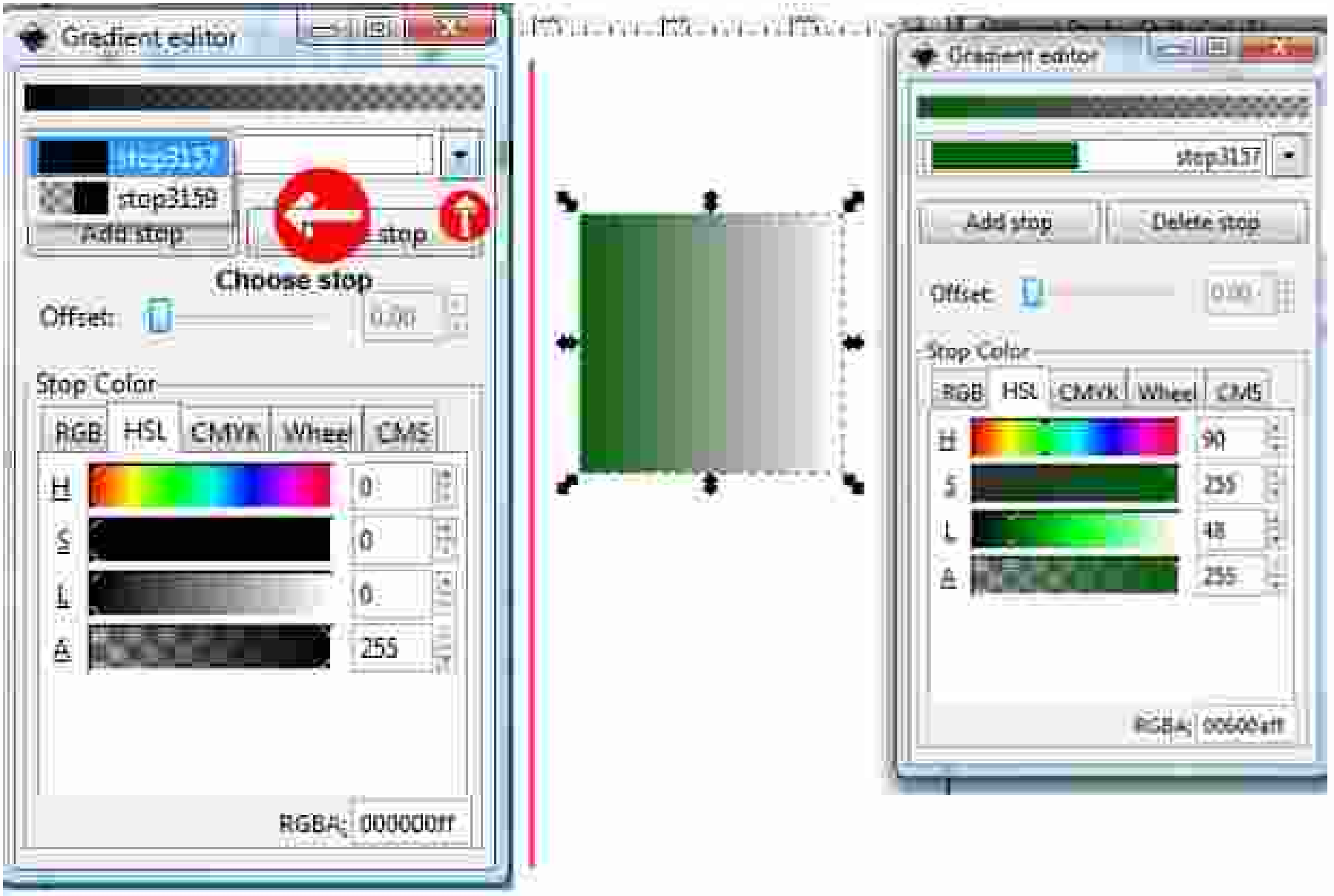
Fill and Stroke continued...

Editing Gradient Color

Gradients work by taking two or more totally different colors, called “stops”, and blending them together smoothly. Each stop can be manipulated as its own color. Each stop can have its own transparency and properties.

By default, Inkscape has created a two-stop gradient. The first stop – the beginning of the gradient – is solid black. The second stop – the end of the gradient – is black too, but the black color is totally transparent.

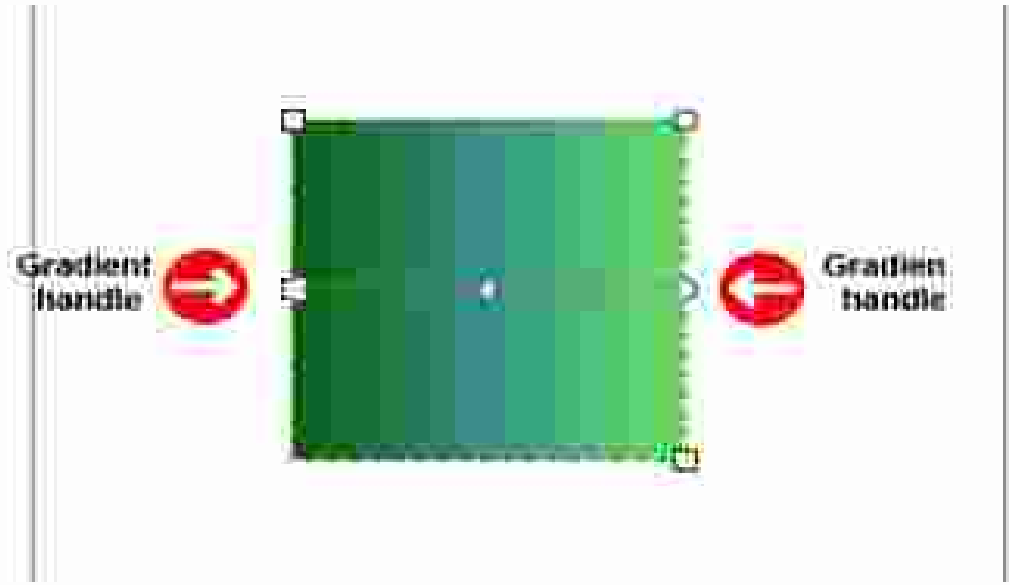
Gradients

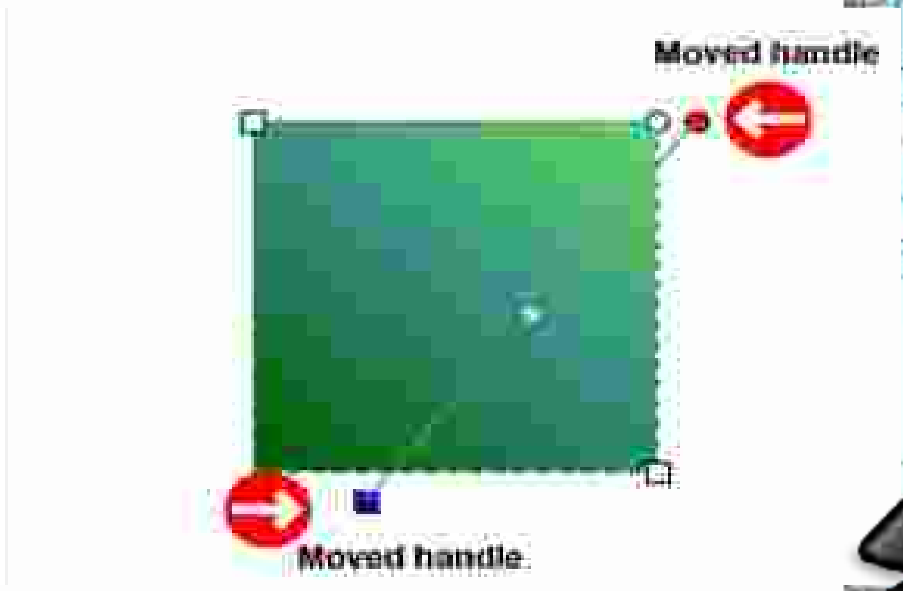

Gradient editor
stop3157
stop3159
Add stop
stop
Choose stop
Offset:
Stop Color
RGB
HSL
CMYK
Wheel
CMS
H
S
L
A
0
0
0
255
RGBA: 00000000
Gradient editor
stop3157
Add stop
Delete stop
Offset:
Stop Color
RGB
HSL
CMYK
Wheel
CMS
H
S
L
A
90
255
48
255
RGBA: 00606eff

Editing Gradient Direction

By default, linear gradients in Inkscape go from left to right. But what if you want the gradient to flow in a different direction?

First, make sure your shape is still selected, and switch over to your Edit Path by Nodes tool by clicking its icon in the tool panel. You'll see some dots appear around the edges of your shape. You'll also see some gradient direction handles appear. You can edit your gradient direction by using the Edit Path by Nodes tool to arrange the gradient at any angle.

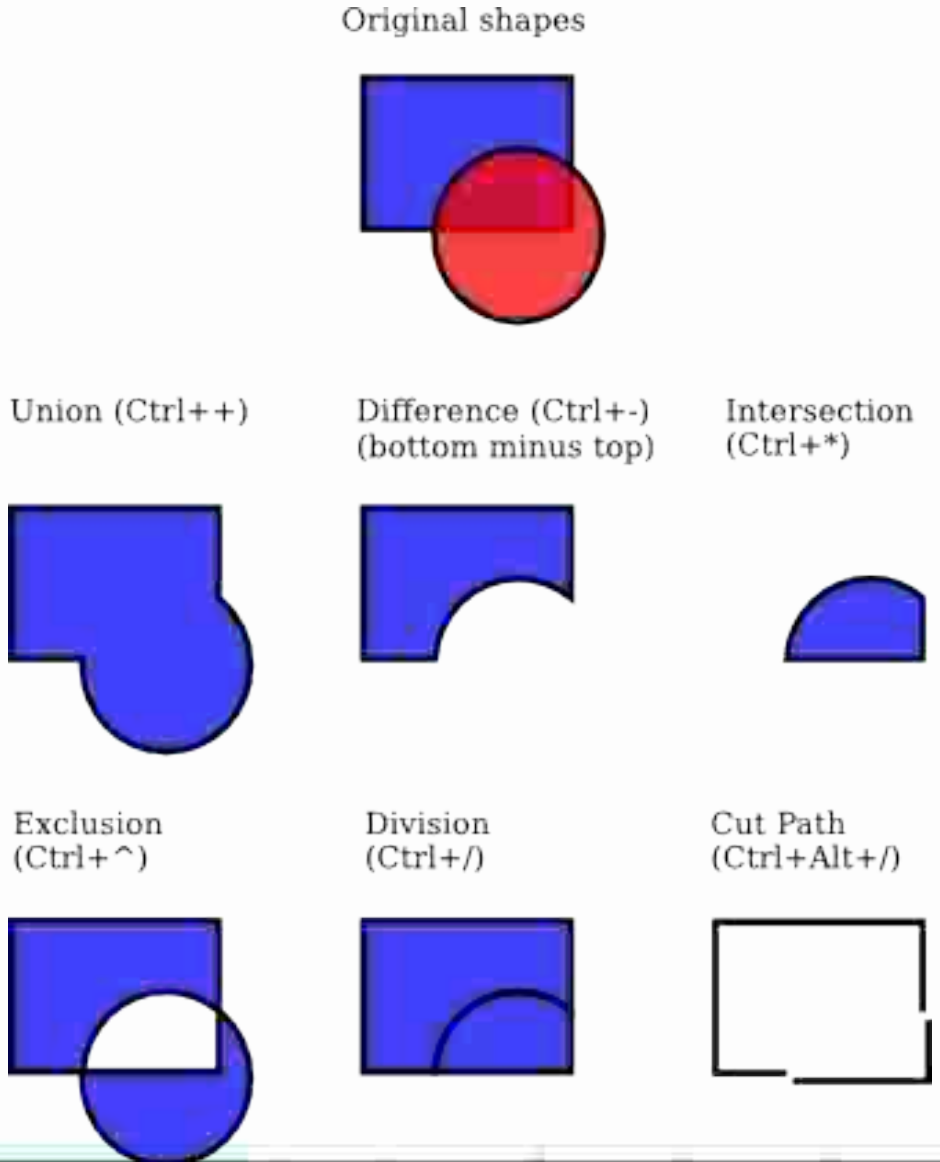




Other important features in Inkscape

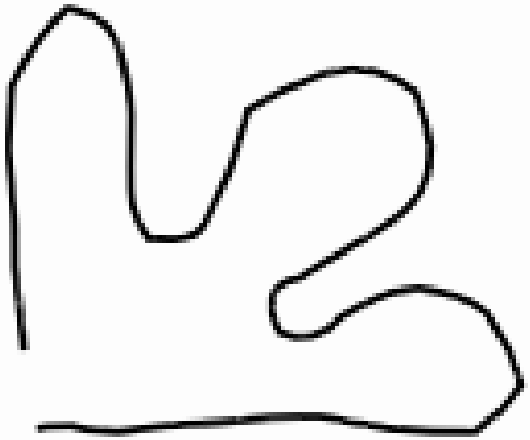
- Clones

- Paths (and 'Path' menu operations)
  - Boolean operations

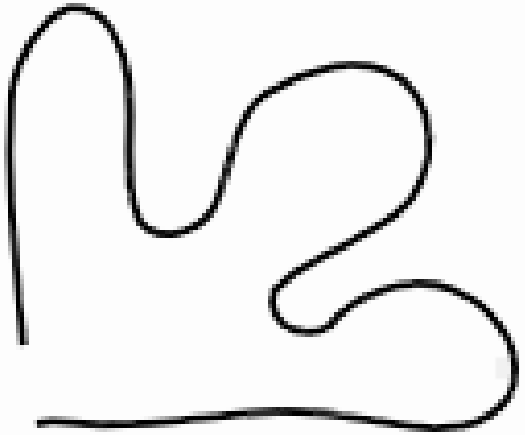


Simplification of Paths

Useful in reducing number of nodes on a path (almost preserving its shape)

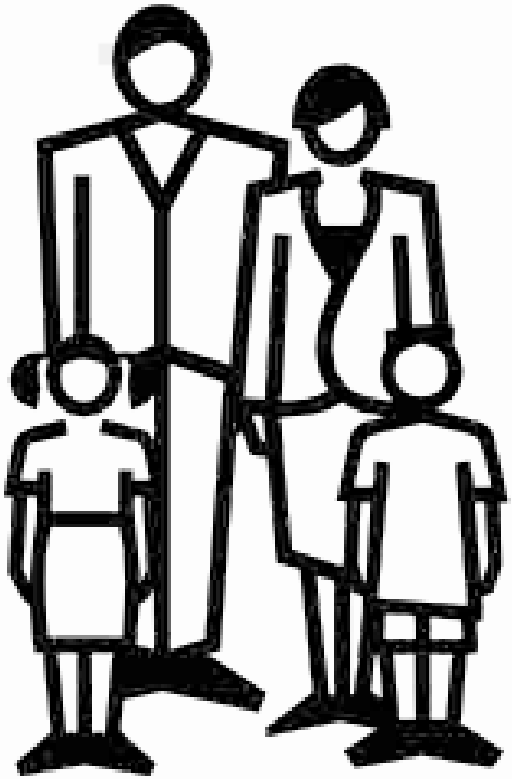


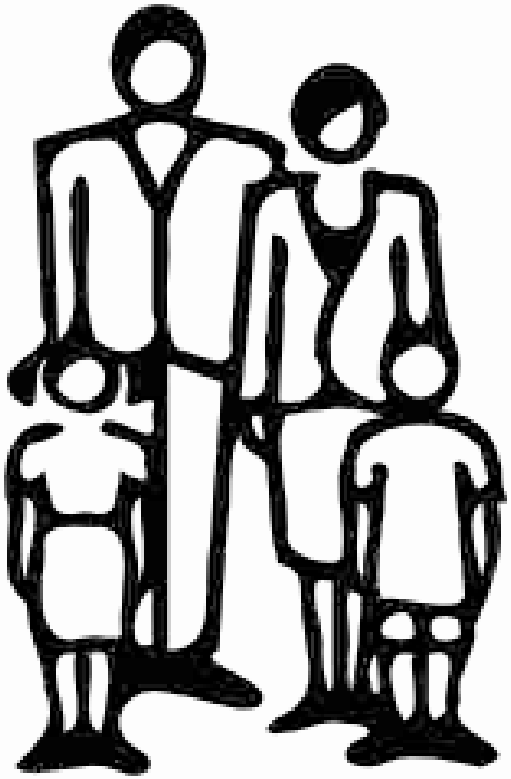
Original

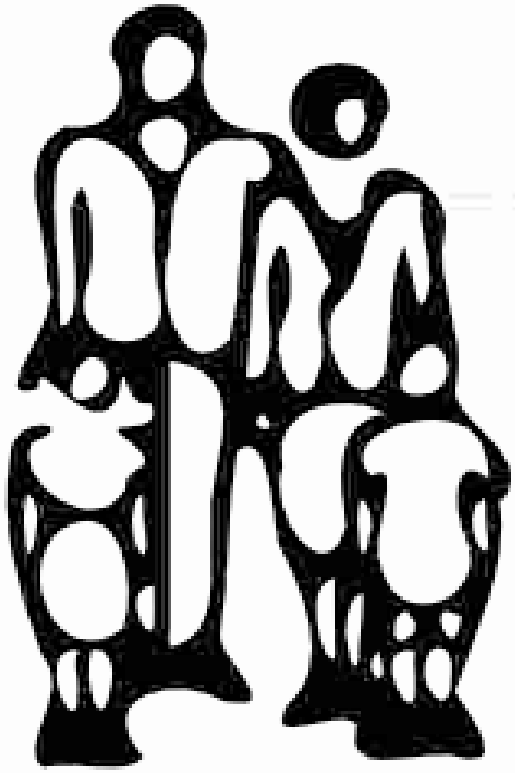


Slight simplification

Aggressive simplification







Other important features in Inkscape

- 'Object' menu

  - Align and distribute

  - Rows and columns

- Filters

  Filter effects is a part of SVG specification. Simple ways to style text using Inkscape. ver 200 preset SVG filters

  - ABCs > Roughen

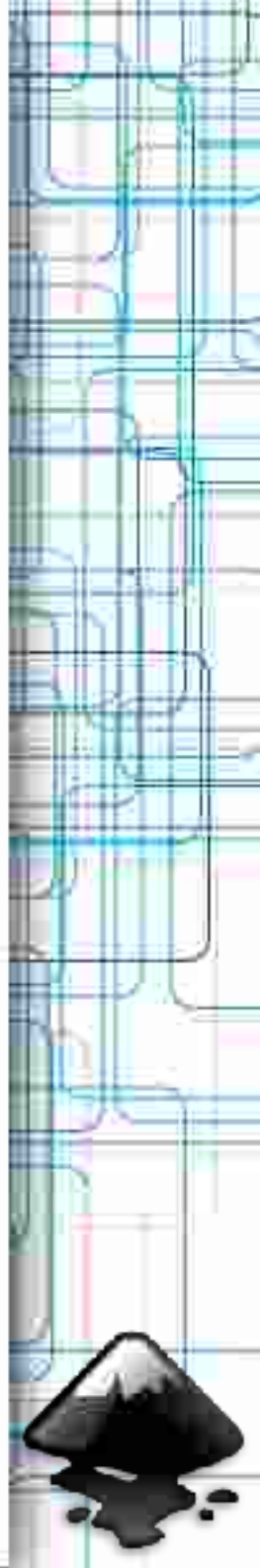
  - Bevels > Glowing metal

  - Distort > Torn Edges

  - Textures > Melted rainbow

  - Scatter > Cubes

  - Non-realistic 3D shaders



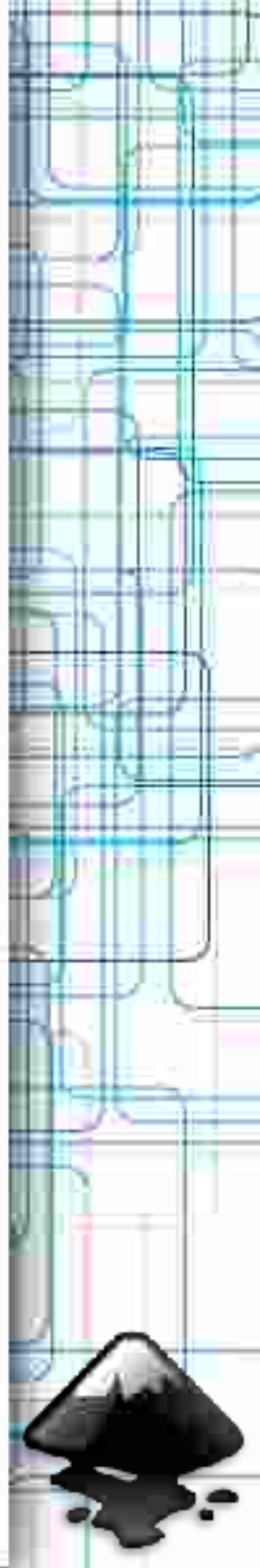
Other important features in Inkscape

- 'Extensions' menu:

  Script plugins. Extensions are computer programs designed to be incorporated into another software in order to enhance, or extend, the functionalities of the latter. On its own, the program is not useful or functional.

  Some examples:

  - Generate from path > Interpolate
  - Modify path > Edge 3D
  - Render > Gear
  - Render > Spirograph



Tracing (SHIFT+ALT+B)

• Potrace bitmap tracing engine

• Tracer's purpose is not to reproduce an exact duplicate of the original image. No autotracer can do that.

• It give you a set of curves which you can use as a resource for your drawing.

• Potrace interprets a black and white bitmap, and produces a set of curves.

• Three types of input filters:

- Brightness cutoff

- Edge detection

- Color quantization

• After tracing, Use Path > Simplify (Ctrl+L) on the output path to reduce the number of nodes. Makes the output of Potrace much easier to edit.

• Output representation is approximate and rough, but makes drawing much simpler and easier to edit.

• Does not produces an exact rendering of the image, but a set of curves that you can use in your drawing.

Tracing continued...

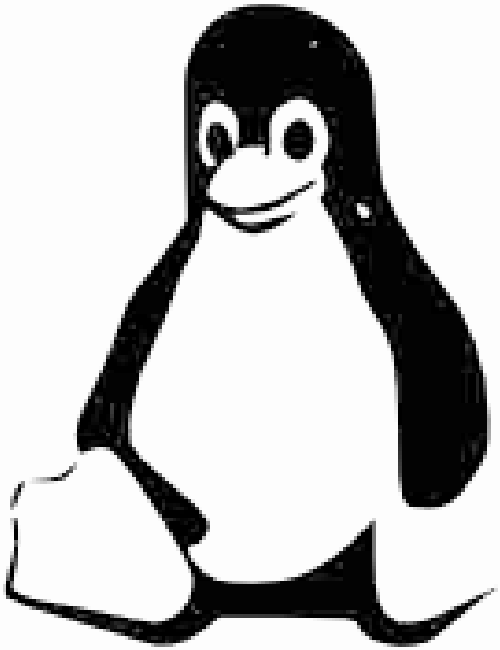
Brightness cutoff

• Sum of the red, green and blue (or shades of gray) of a pixel as an indicator of whether it should be considered black or white

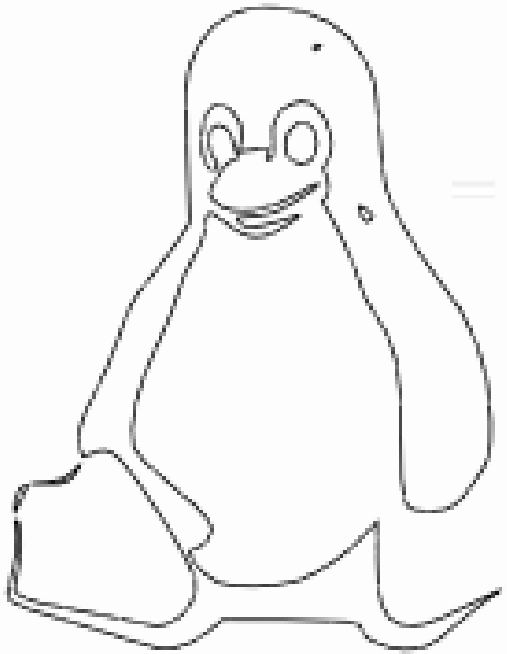
• Ranges from 0.0 (black) to 1.0 (white)

• Higher the threshold setting, the fewer the number pixels that will be considered to be “white”, and the intermediate image with become darker.

Original Image



Brightness Threshold
Fill, no Stroke



Brightness Threshold
Stroke, no Fill

Tracing continued...

Optimal Edge Detection

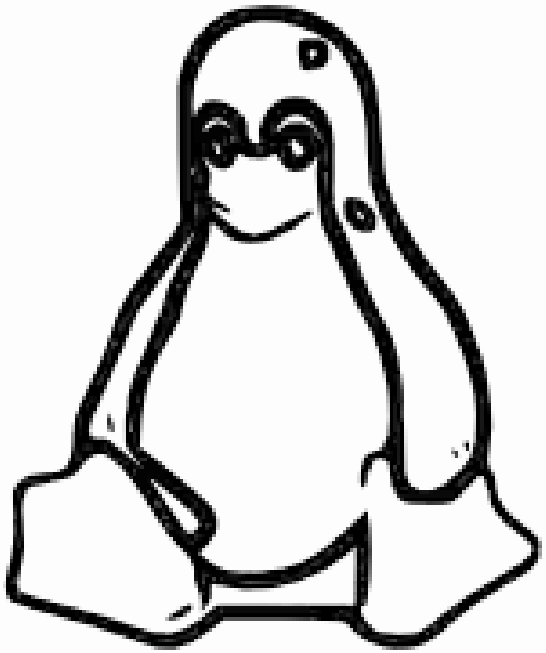
• Uses edge detection algorithm devised by J. Canny for quickly finding isoclines (series of lines with the same slope) of similar contrast

• Look less like the original image (than result of Brightness cutoff) but will likely provide curve information

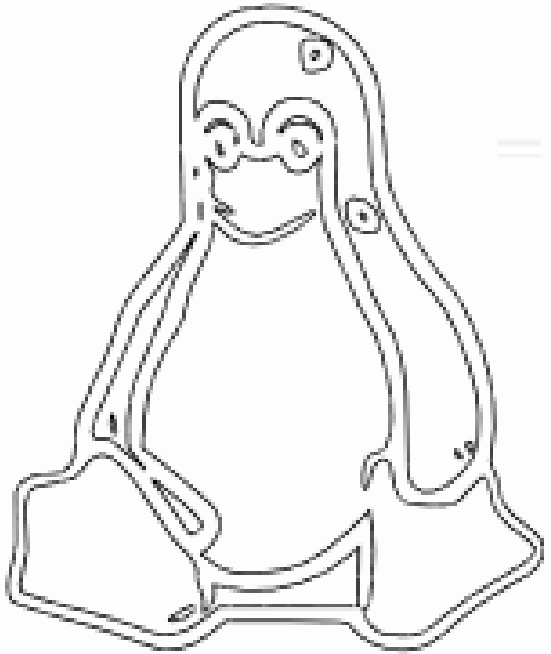
• Threshold setting ranges from 0.0 – 1.0

• Adjusts the darkness or thickness of the edge in the output

Original Image



Edge Detected
Fill, no Stroke



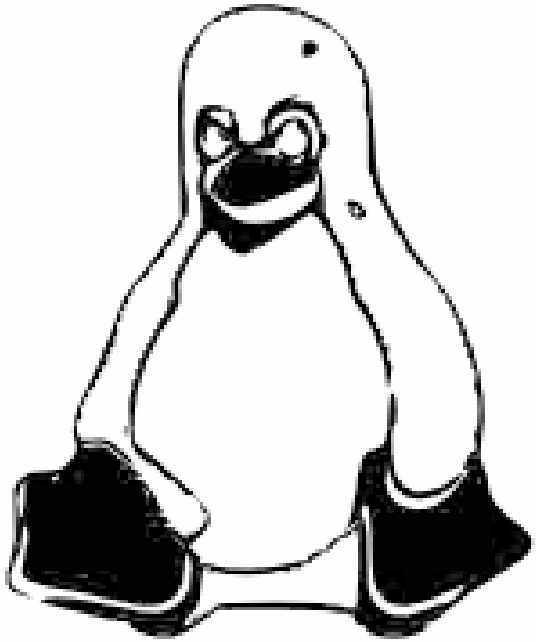
Edge Detected
Stroke, no Fill

Tracing continued...

Color Quantization:

- Produce an intermediate image
- Finds edges where colors change, even at equal brightness and contrast.
- Number of Colors: how many output colors there would be if the intermediate bitmap were in color.
- Selects black/white on whether the color has an even or odd index.

Original Image



Quantization (12 colors)
Fill, no Stroke

Quantization (12 colors)
Stroke, no Fill

INTERMISSION ;-)

Anyone wants to ask something?

Inkscape -keys and mouse reference

http://www.inkscape.org/doc/keys047.html

Inkscape: Books, tutorials, docs, blogs etc.

If you want to learn more about inkscape, refer to following links:

Inkscape documentation:
http://www.inkscape.org/doc/index.php?lang=en

Inkscape wiki:
http://wiki.inkscape.org/wiki/index.php/Inkscape

Inkscape userblog:
http://inkscapetutorials.wordpress.com/

Inkscape manual (@FLOSS)
http://en.flossmanuals.net/Inkscape/

Inkscape FAQ is also worth reading:
http://wiki.inkscape.org/wiki/index.php/FAQ

Inkscape user manual:
http://www.angelfire.com/mi/kevincharles/inkscape/index.html

The book of Inkscape (By Dmitry Kirsanov)
http://oreilly.com/catalog/9781593271817

Help me!

If you need help with Inkscape, following sources are useful:

- Read documentation, FAQ etc ;-)

- IRC:
  #inkscape on irc.freenode.net

- Mailing Lists:
  http://www.inkscape.org/mailing_lists.php?lang=en

- Forums:
  http://www.inkscapeforum.com/

- Discussions:
  http://www.inkscape.org/discussion.php?lang=en