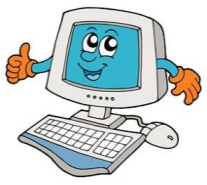
2 Animation Tool : Synfig



In previous chapter, we discussed about multimedia and the basic building blocks of multimedia. To create a multimedia presentation using these building blocks we need application programs known as multimedia authoring tools. These authoring tools provide the important framework to organize and edit the multimedia elements like graphics, sound, video and animation.

Generally, the authoring tools are classified into:

- Card or Page based tools
- Icon and Event based tools
- Time based tools

In Card or Page based authoring tools the elements are organized as pages of a book or pile of cards. The authoring tool links these pages into an organized sequence. These types of tool are useful when the different elements can be viewed individually like the pages of a book. Some examples of card based authoring tools are Hypercard and Multimedia Toolbook.

In Icon and Event based authoring tools the elements are organized as objects in a structural framework or process. Here you need to build the flowchart of the events or tasks and then add the elements as per the structure. Some examples of icon and event based authoring tools are Authorware and IconAuthor.

In Time based authoring tools the elements are organized along a timeline. They are useful when you want to give a message that has a beginning and an end. The elements are displayed as per the time or location of the events. Time based authoring tools are the most popular amongst all. Some examples of time based authoring tools are Synfig, Pencil, Flash and Director.

There are many multimedia tools available in the market. Some of these tools are proprietary while others are open source. Some of the open source animation tools easily available on internet are Pencil and Synfig.

Pencil

Pencil is a 2D animation software that lets you create traditional hand-drawn animation using both bitmap and vector graphics. It can be freely downloaded from http://www.pencil-animation.org. It is available on various operating systems like Linux, Windows and MacOS X.

Figure 2.1 shows the user interface of pencil software. The interface looks quite similar to other animation or drawing softwares. In pencil animation software, you can create good animation if you are good at free hand drawing instead of object drawing.

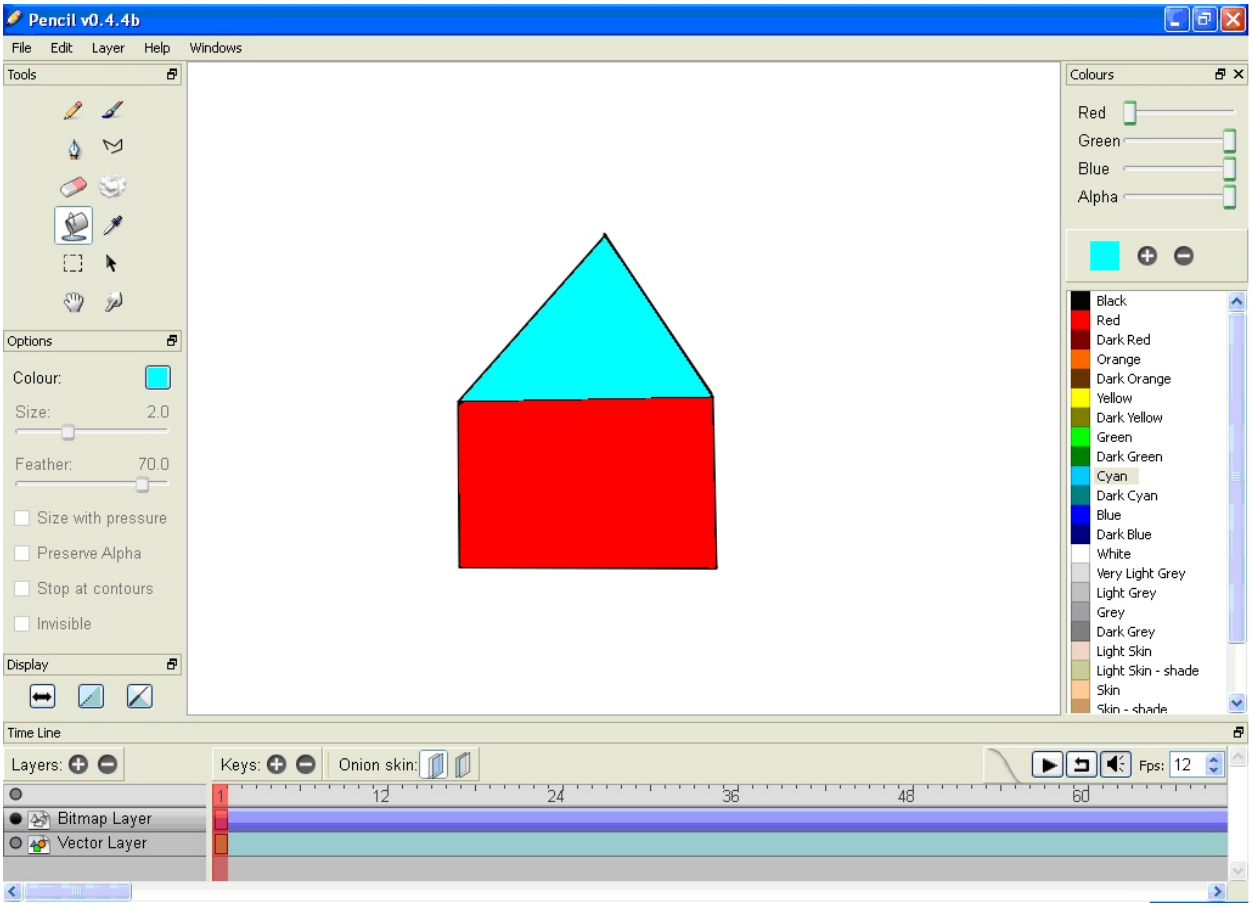


Figure 2.1 : User interface of Pencil animation software

For object drawing and animation, let us learn about an open source animation tool called Synfig Studio.

Synfig Studio

Synfig Studio is a time based multimedia authoring tool that falls in the category of open source. It is available free of cost on the internet and can be downloaded from http://www.synfig.org . Synfig Studio (or simply Synfig) is 2D vector animation software released in 2005 under the GNU GPL (General Public License). It is designed to produce film-quality animation with fewer people and resources. It is available on various operating systems like Linux, Windows and MacOS X. The first version of Synfig was 0.61.05 and new versions have been regularly launched with additional features till date. The latest version of Synfig is 0.63.05. Since it is not available as a standard package in Ubuntu Linux, we need to install it first. Once installed, it will be available under the Graphics option of Applications menu.

Synfig stores animations in XML (extensible markup language) file format, often compressed using compression software gzip which stands for GNU zip. These files use the filename extension .sif in uncompressed form or .sifz in compressed form.

Getting Started

To start Synfig, in the menu bar click Applications → Graphics → Synfig. When you start Synfig Studio you must have observed that it does not start in one window, but opens a number of individual

windows on the desktop. We can drag the window to change the size. If you want to reset the Synfig studio window to default window arrangement as shown in the figure 2.2 then go to Toolbox → File menu → Panels → Reset Windows to Original layout.

Let us first get familiar with the user interface of Synfig. In figure 2.2 you can see the Synfig studio window layout.

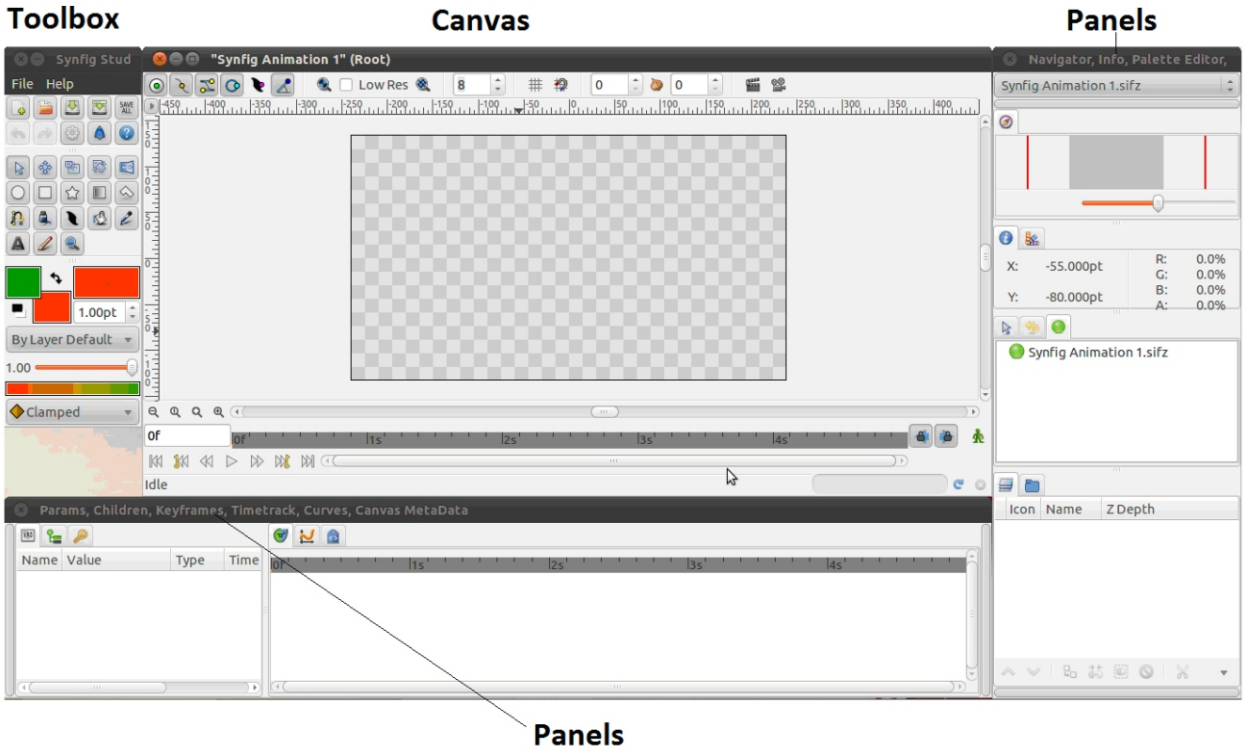


Figure 2.2 : Synfig user interface

As seen in the figure 2.2 the components in the user interface are: toolbox, canvas and panels. Let us discuss the role of each of them.

Toolbox

Toolbox is the main window which contains system menu and tools to create and edit your artwork as shown in figure 2.3. Closing the toolbox exits the application. Even if you have several projects open there will only be one Toolbox for all.

Using the toolbox we can create a new file, open an existing file, save the file and setup properties. The toolbox also contains the general tools like circle, rectangle, transform and others, for creating and editing an object. The toolbox window is separated into three areas or palette:

- The upper palette contains buttons for standard file operations like create a new file, open a file, save, save all files, undo and redo as well as access to the settings dialog and the help system.
- In the middle palette we have the tools like circle, rectangle, transform and others for creating and manipulating an object. We will learn more about each tool later in this chapter.

- The lowest palette contains the default settings for new layers like :
  - **Foreground and background color** : it creates the fill and the outline colors for the object. When we create a layer without outline then it has only fill color. We can change the color by clicking on fill or outline color.
  - **Brush size :** sets the size of the line for new outline layers.
  - **Blend method :** sets the blend method which will be discussed in the later chapters. It is set to "By layer default".
  - **Opacity :** it controls the layers visibility. 0 means the layer is invisible and 1 means the layer is visible.
  - **Gradient :** used by Gradient layers as their fill. It sets to a default gradient between the foreground color and background color.
  - **Interpolation :** each waypoint has an interpolation setting which determines the manner in which the parameter changes.

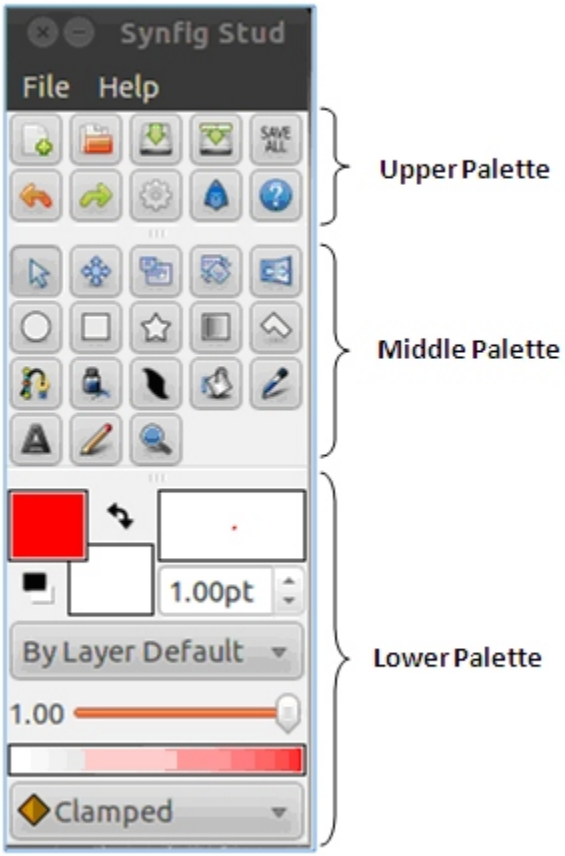


Figure 2.3 : Toolbox

Canvas

When you open a new file or create a new project you will see the canvas window. It can be seen at the center of the user interface as shown in figure 2.4. This is the place where you display your artwork and create animation. Whenever we start Synfig studio a new canvas window appears.

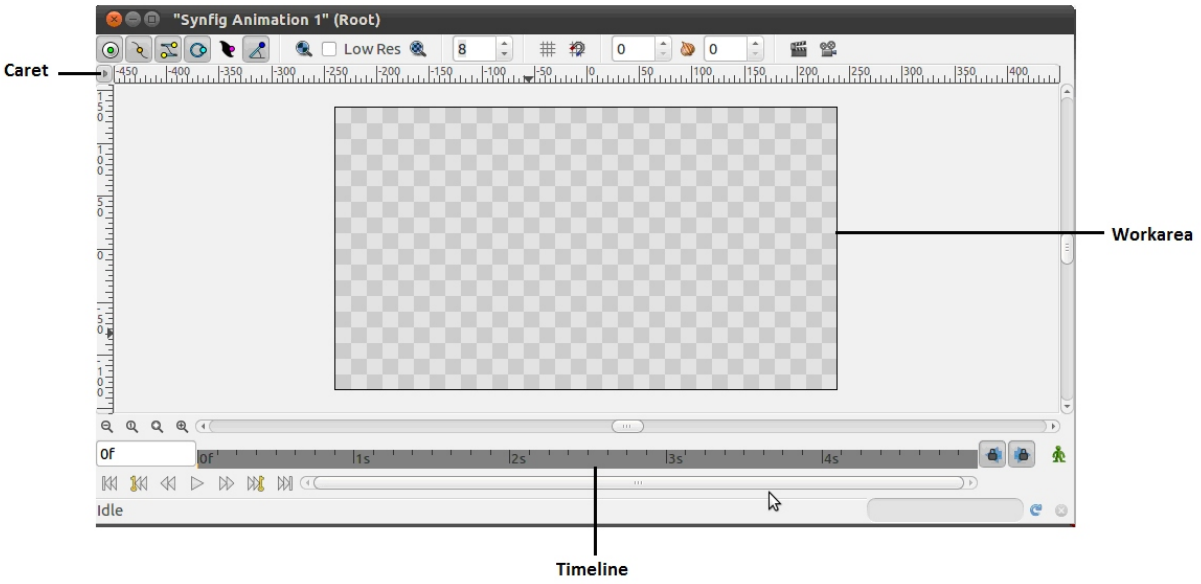


Figure 2.4 : Canvas Window

The area with the grey check-board pattern is the working area in which you can create elements/ layers and manipulate them.

In the upper left corner of the canvas window you can see caret , a little black triangle. Clicking on this button, the canvas window menu will pop up which allows access to most of the Synfig features. Generally, in most of the applications you find the set of menus at the top of the screen or at the top of the drawing window.

You can also see the timeline which appears only when you have non-zero duration in the settings dialog of your project. To the left you can see the number of the current frame and on the right side two buttons to switch the animation status and to lock/unlock the keyframes.

Panels

Synfig has different type of panels like layers, parameter, history etc. Panels contain tools and information about certain elements of your project. Some panels will allow you to modify these elements.

The two windows on the bottom and to the right are customizable dock dialogs. Each dock dialog contains a set of panels which are arranged horizontally or vertically. Some panels share the same space inside the dock dialog and we can switch between them by clicking on their tabs. We can rearrange the contents of dock dialogs by dragging the panel tab to where we want it. If accidentally we close a panel go to the Toolbox, select File → Panels and click on the name of the panel you need. Then drag the panel into the dock dialog where you want to place it. Figure 2.5 and 2.6 shows the panels arranged vertically and horizontally.

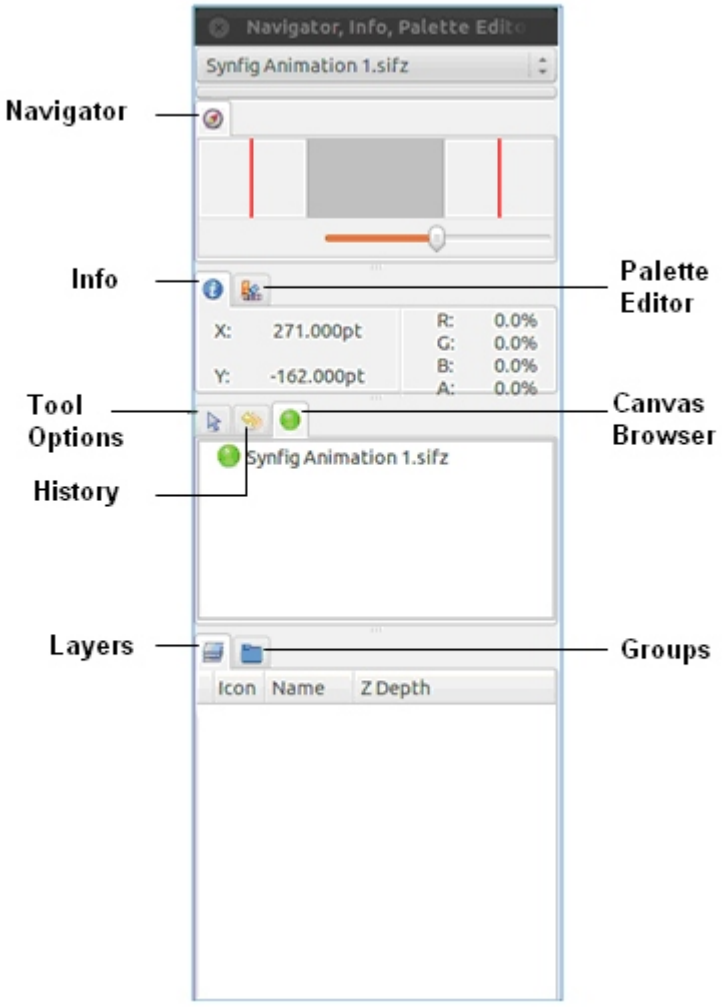


Figure 2.5 : Panels arranged vertically

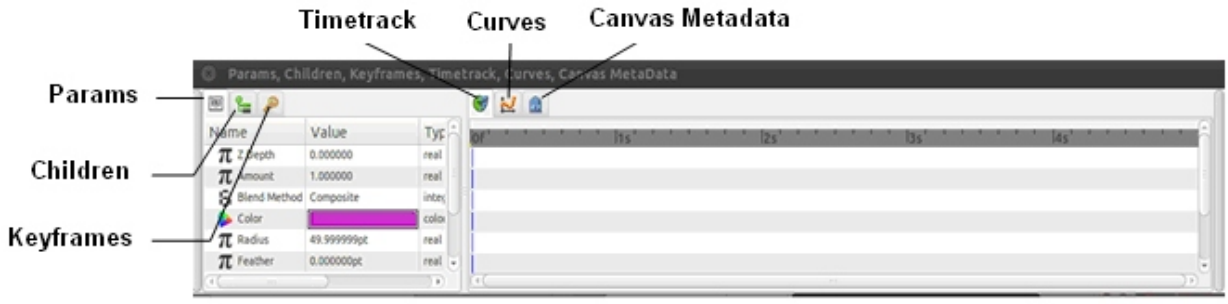


Figure 2.6 : Panels arranged horizontally

Let us discuss the function of some of the important panels:

Layers Panel

It displays the layers of your working canvas. It also allows you to manipulate these layers.

Params Panel

It shows the currently selected layer parameters. When multiple layers are selected, only the parameters that are common in the selected layers are displayed.

Tool Options Panel

It shows options that are specific to the currently selected tool.

Navigator

It shows a thumbnail image of what the currently selected canvas looks like. We can also zoom in and move the focus around.

History Panel

It keeps track of all the actions that are done while editing the file. The check box column is used to disable specific actions without going through the entire action list. So if we want to redo or undo an action or group of actions just click on the check box.

There are many other panels and to know about each simply hold mouse over its icon and a tooltip will pop up describing its function.

Creating new file

Now let us see how to create a new file and set its properties. To create a new file, perform the following steps:

- Select Toolbox → New file. Alternatively, when you start Synfig a new file is automatically created.

Click on the Caret → Edit → Properties. This will open a dialog box as shown in figure 2.7.

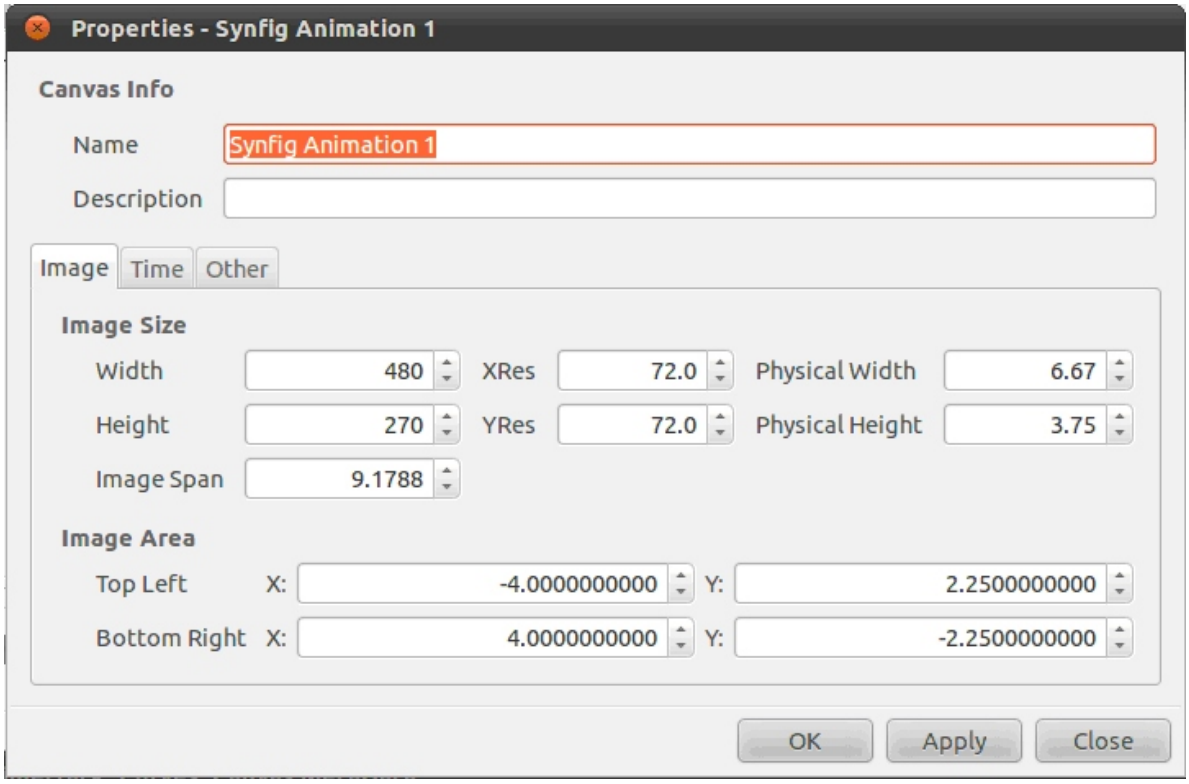


Figure 2.7 : File properties dialog box

You can set the name of the file and give a description to your animation. In the window, you can see three tabs namely *Image, Time* and *Other*. The *Image* tab is used to set the image size and image area as shown in figure 2.7. The *Time* tab is used for setting the start time, end time and frames per second. The default settings are as shown in figure 2.8. We will learn more about these properties later.

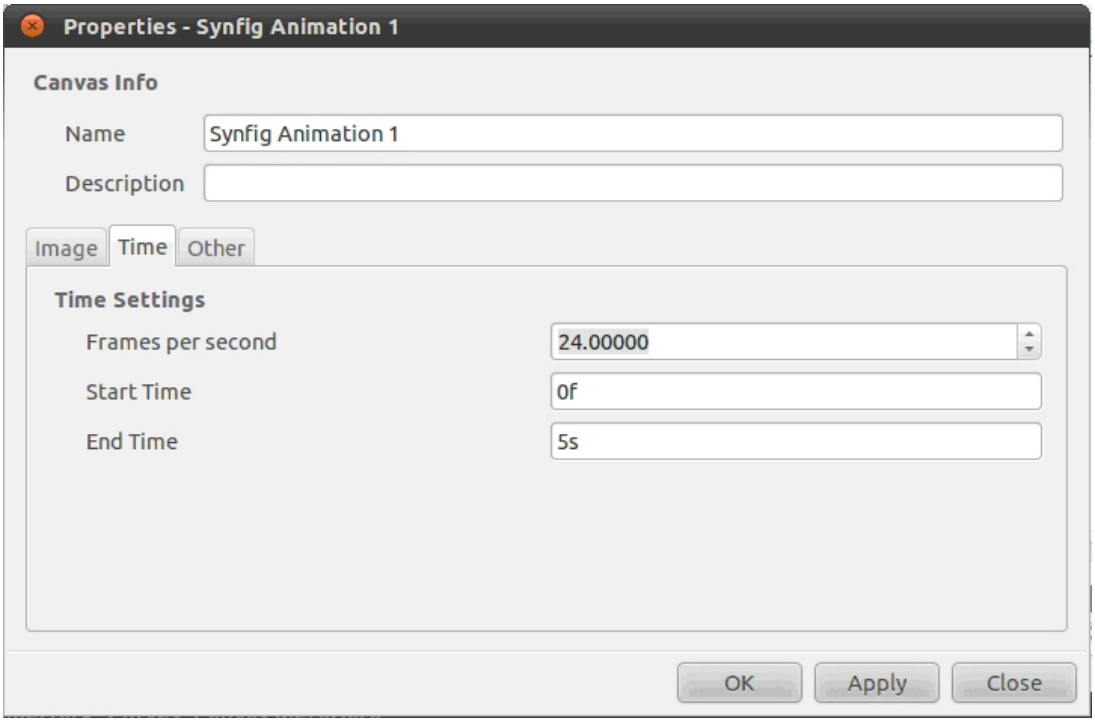


Figure 2.8 : File property dialog box with time tab selected

- Now click OK button and the changes will be applied.
- After creating the file and setting properties we can now start creating our artwork and animation.

Let us now see different tools used to create and manipulate an object.

Tools

Tools help you to create the artwork for your multimedia project. Synfig provides various tools to create and manipulate an object. Figure 2.9 shows these tools, each tool has its own set of options and parameters. Tools are visible in the tool options panel. And parameters are visible in the parameter panel. When you select a particular tool, the tool options panel displays the options that are available for that tool.

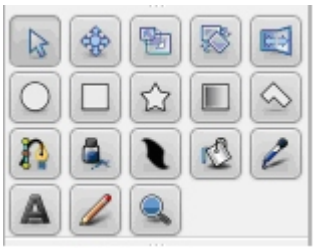


Figure 2.9 : Tools to create and manipulate objects

Let us first discuss the tools used to draw an object.

Circle Tool

The Circle tool is used to create new circle layer. Circle layers are used to represent circles. A circle has two important parameters: centre and radius. You can see the parameters in the parameter panel. We can change any of the parameter after drawing the object.

To draw a circle select the circle tool, Click in the working area where you want the center of the circle to be and then drag to set the radius as shown in figure 2.10.

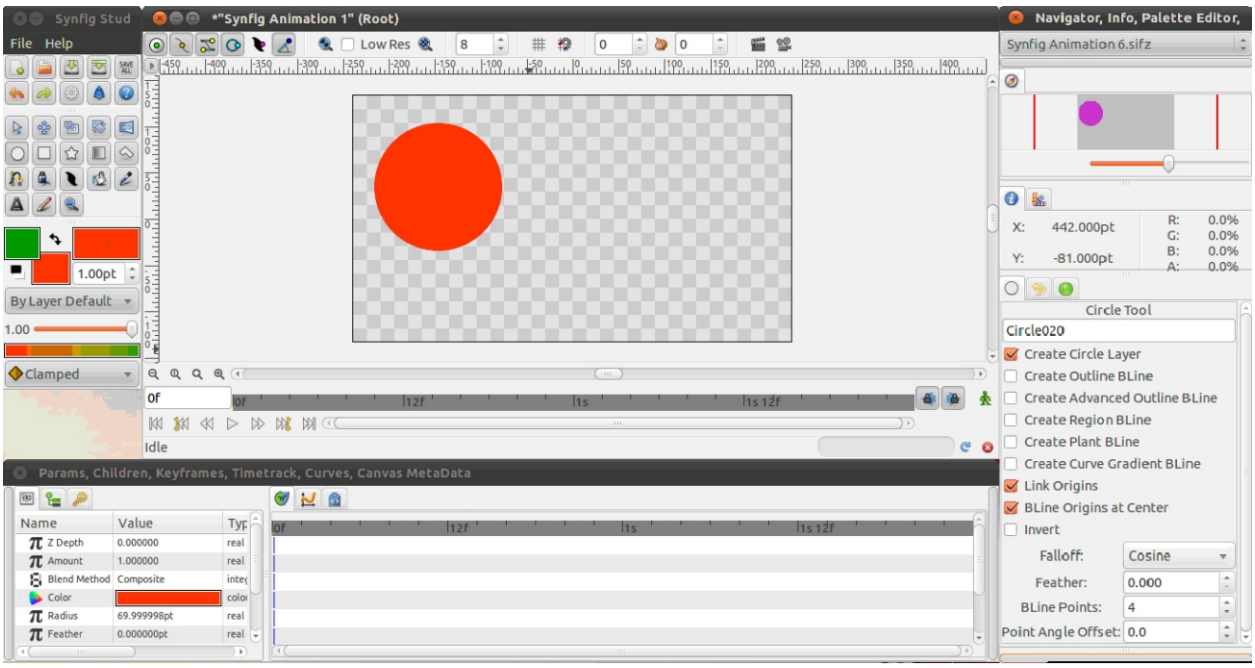


Figure 2.10 : Use of Circle tool

Using the tool options panel you can also change the name of the circle layer, create additional layers using the checkboxes like create outline layer which is used to create an outline around the circle. In the figure 2.10, only the *Create Circle Layer* is selected. If we select the *Create Outline Bline* option then the circle object will be created with an outline.

If you want to edit the circle, say for example you want to increase the radius of the circle or move the circle then click on the duck as shown in the figure 2.11. In case the ducks are not visible then click on the transform tool to see the ducks. You may be wondering what a duck is?

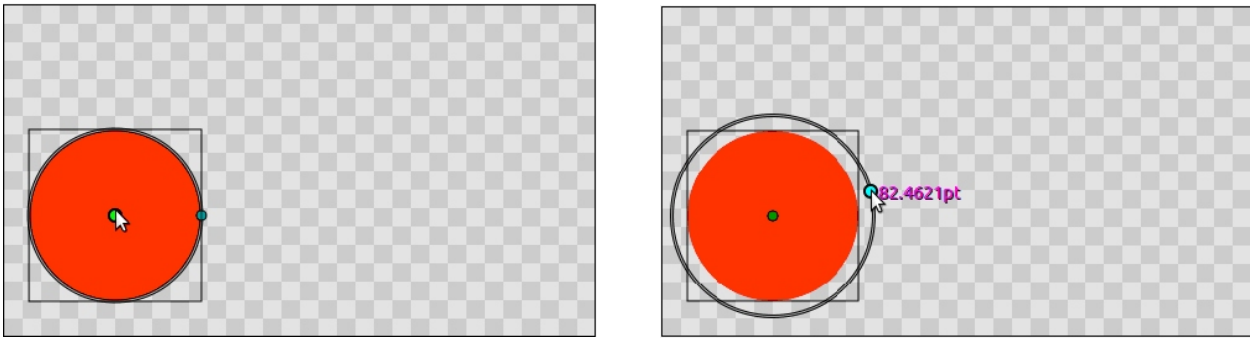


Figure 2.11 : Ducks for circle

A duck is a handle that is used to control some parameter of a layer. For example, a circle will have two ducks: one to control the position of its centre, and second to control its radius. In figure 2.11, you can see the green and blue colored ducks. Ducks come in different color and they have specific meaning. The color of the duck signifies a change in the following aspects of the object:

- Green – position of the object
- Blue – radius of the circle
- Orange – vertices
- Yellow – curves
- Dark blue – to change the angle in star

In figure 2.11 the green duck is used to change the position of the circle and the blue color duck is to change the radius of the circle. Ducks are displayed in the work area for all the currently selected layers. You have to drag the ducks to change the parameters. You can even use the cursor keys for more precise control. If you want to constrain the movement to be either horizontal or vertical then hold down the shift key while dragging.

Sometimes, one type of duck interferes or gets into the way of another duck. You can turn the ducks on/off by selecting the option present on the top of the canvas window as shown in figure 2.12.

Figure 2.12 : Turn on/off various ducks

Rectangle Tool

We can use the rectangle tool in the same way we used the circle tool. It is used to create a rectangle layer. To draw a rectangle, select the rectangle tool, click where you want any corner of the rectangle to be, and then drag to the opposite corner as shown in figure 2.13.

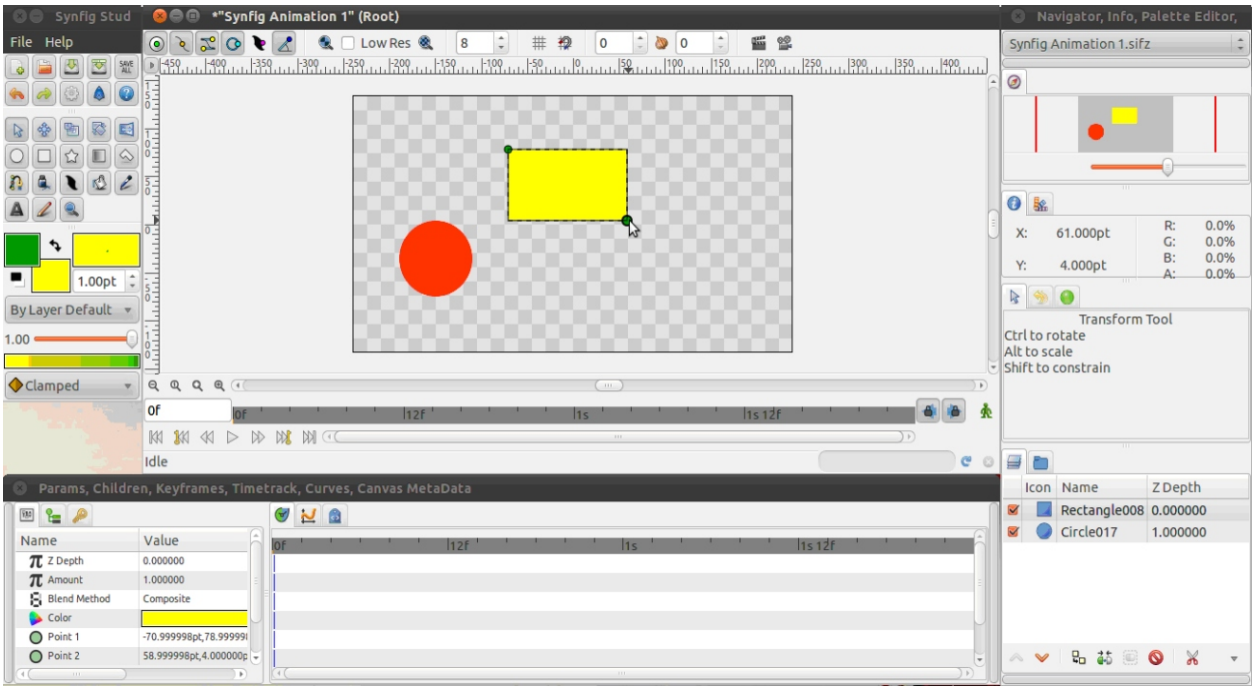


Figure 2.13 : Use of Rectangle tool

You can also see the tool options available in the tool options panel. Also the parameters are displayed in the parameter panel. As we have two objects on the working area, the parameter panel displays the parameters that are common to circle and rectangle. This way we can change a single parameter to make changes in all the objects. If we want to see the parameters of only the rectangle object; then in the layers panel we can select rectangle layer which will now display the parameters of rectangle only.

We can make the changes to the rectangle by selecting the duck and then dragging it. Figure 2.14 shows the ducks for the rectangle tool.

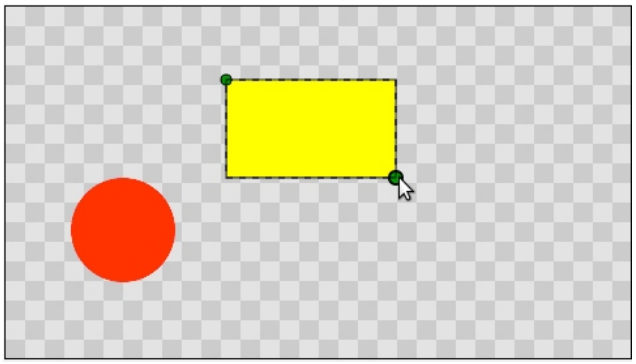


Figure 2.14 : Ducks for Rectangle tool

Star and Polygon Tool

Likewise, we can use the star and polygon tool to create the star layer and polygon layer. The only change that you can see is while editing them. The ducks for each shape is different and change accordingly. Figure 2.15 (a) shows use of star tool and ducks to edit the star. Make the changes to see the difference. Figure 2.15 (b) shows how to draw polygon with polygon tool. A polygon can be created using any number of points and then click on the first point to close it.

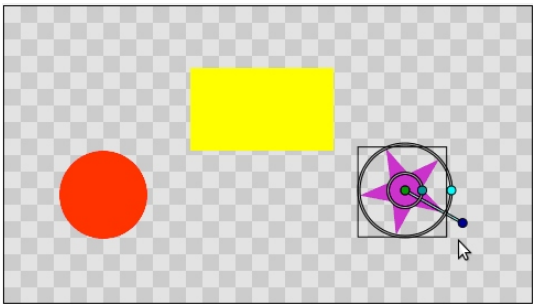


Figure 2.15(a) : Use of Star tool

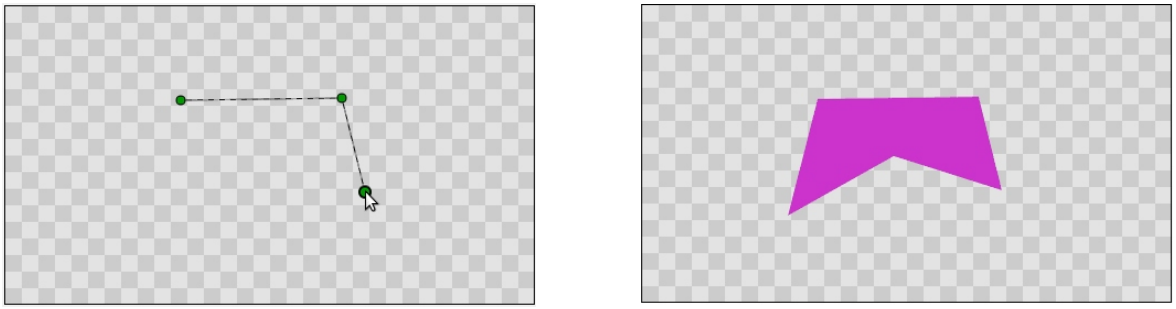


Figure 2.15(b) : Use of Polygon tool

BLine Tool

Bline tool is used to make objects with any number of points and curves. Click on the Bline tool and start inserting the points. In figure 2.16 (a) you can see a shape drawn using Bline tool. To stop drawing the object, right click on the last point. After drawing, the object can be edited using the ducks. Figure 2.16 (b) shows the ducks of the shape drawn using Bline tool.

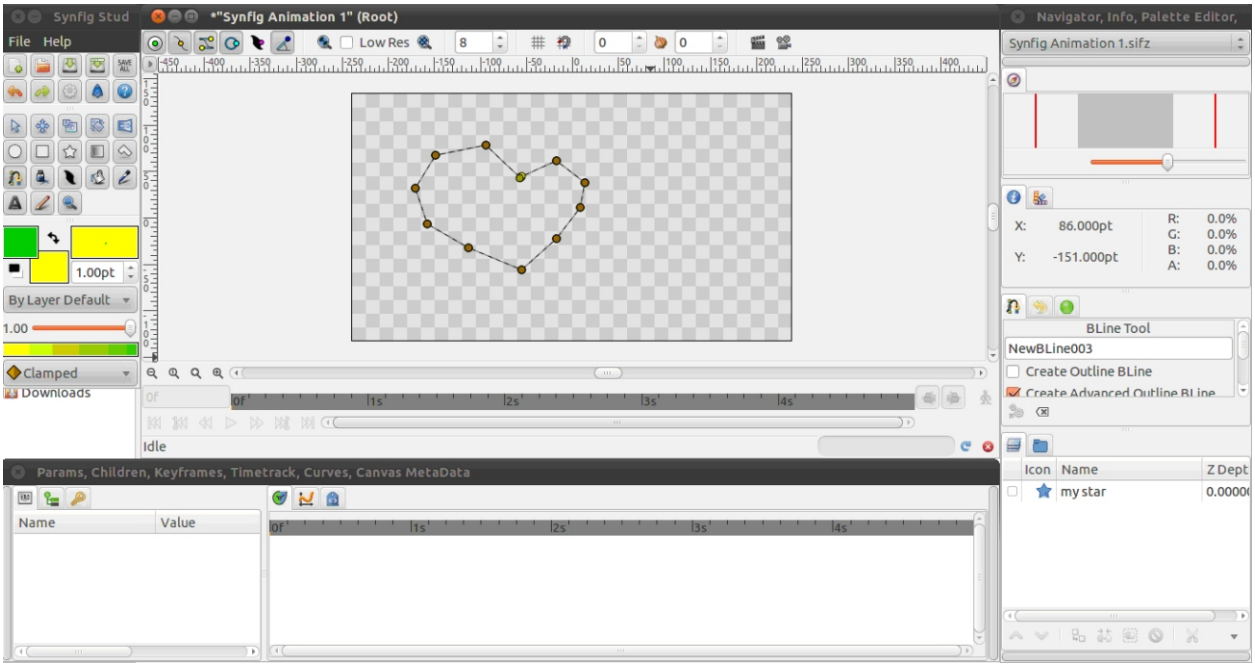


Figure 2.16(a) : BLine tool

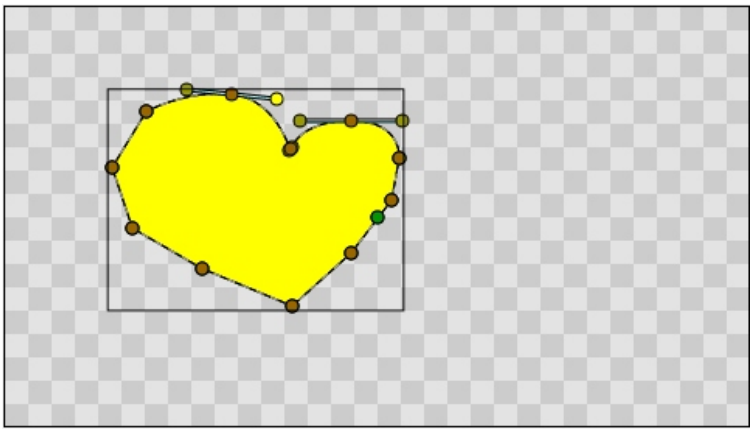


Figure 2.16(b) : Drawn shape with the ducks

After discussing about the object drawing tools, now let us discuss some other tools.

Draw Tool

You must be familiar with the draw tool as it is the most common tool used for drawing. You can draw with the help of mouse. Figure 2.17 shows the use of draw tool.

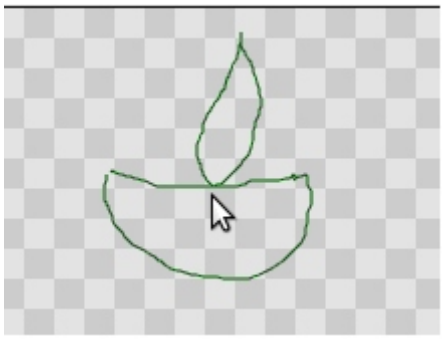


Figure 2.17: Draw tool

Fill Tool

The Fill tool changes the color of objects. To fill a color in the object, select the color from the color palette. Select the Fill tool button and then click on the object. This tool has an effect on the following layers:

- Circle Layer
- Rectangle Layer
- Polygon Layer
- Star Layer
- Region Layer
- Outline Layer
- Checkboard Layer

The other layers are not affected by this tool because they use gradient to fill the visual area.

Eyedrop Tool

The Eyedrop tool allows you to select colors from the Eyedrop tool. Select the Eyedrop tool, and then click in the work area to set the default foreground color in the Eyedrop tool to be the color you are currently pointing at.

Gradient Tool

The Gradient tool is used to create smooth transitions between two or more colors in an object. When you select the Gradient tool, the tool options panel will show the options for the Gradient tool as in figure 2.18.

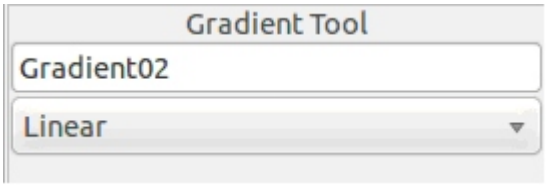


Figure 2.18 : Gradient tool options panel

It allows you to set a name for the layer and choose the type of gradient.

There are 4 types of gradients namely linear, radial, conical and spiral.

Linear - This produces a simple transition in a straight line. Set the foreground and background colors. Click where you want the gradient to begin, and drag to where you want the transition to end. The gradient will be created perpendicular to the line you drag out. You can edit the gradient by moving the endpoint in any direction using the normal tool. Figure 2.19 shows the effect of linear gradient.

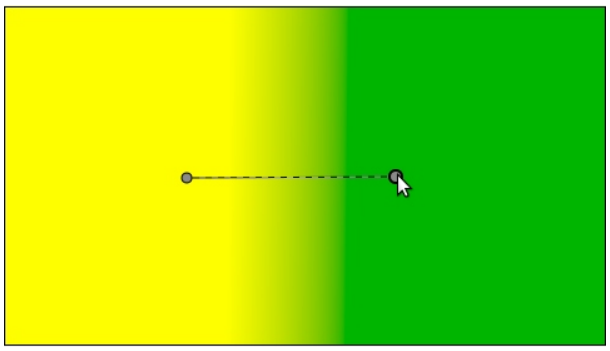


Figure 2.19 : Linear gradient

Radial - This produces circular colors with the transition being at the center of those circles. Click where you want the center of the circles to be, and drag to set the radius of the transition. Figure 2.20 shows the effect of radial gradient.

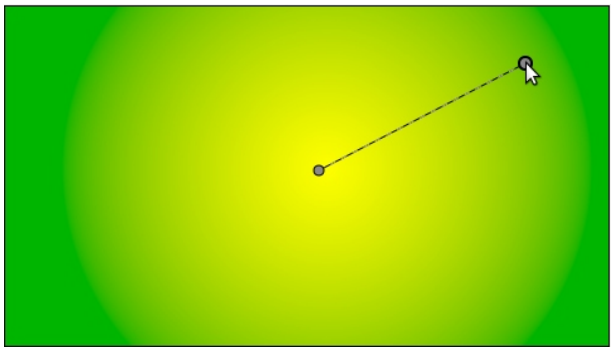


Figure 2.20 : Radial gradient

Conical - This has the appearance of looking down on a tip of a cone. The gradient is along the circular arc of the center and goes in all directions. Click to set the center, and drag to indicate the direction in which the foreground and background colors should go. The center endpoint adjusts the center of the gradient and the other endpoint adjusts the direction of the gradient. Figure 2.21 shows the effect of conical gradient.

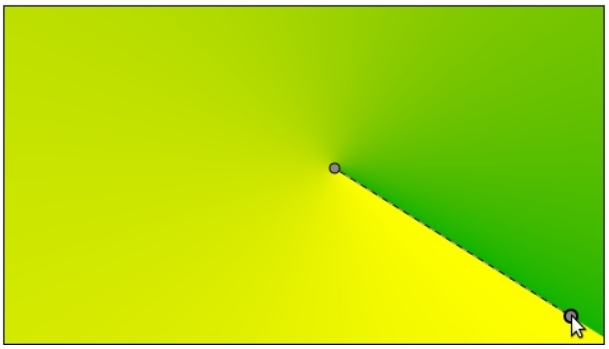


Figure 2.21 : Conical gradient

Spiral - This produces a spiral gradient. Click to set the center of the spiral and drag to set the 'tightness'. Figure 2.22 shows the effect of spiral gradient.

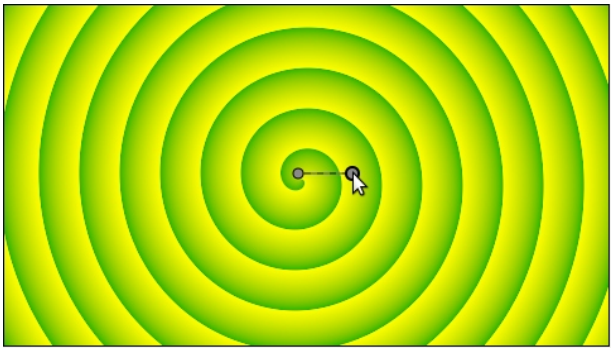


Figure 2.22 : Spiral gradient

Text tool

Text tool allows you to enter text by creating a text layer. Select the text tool icon from the toolbox, and then click in the canvas window where you want the text layer to be created. A dialog box will appear, allowing you to enter the text you want in the created layer as shown in figure 2.23 (a).

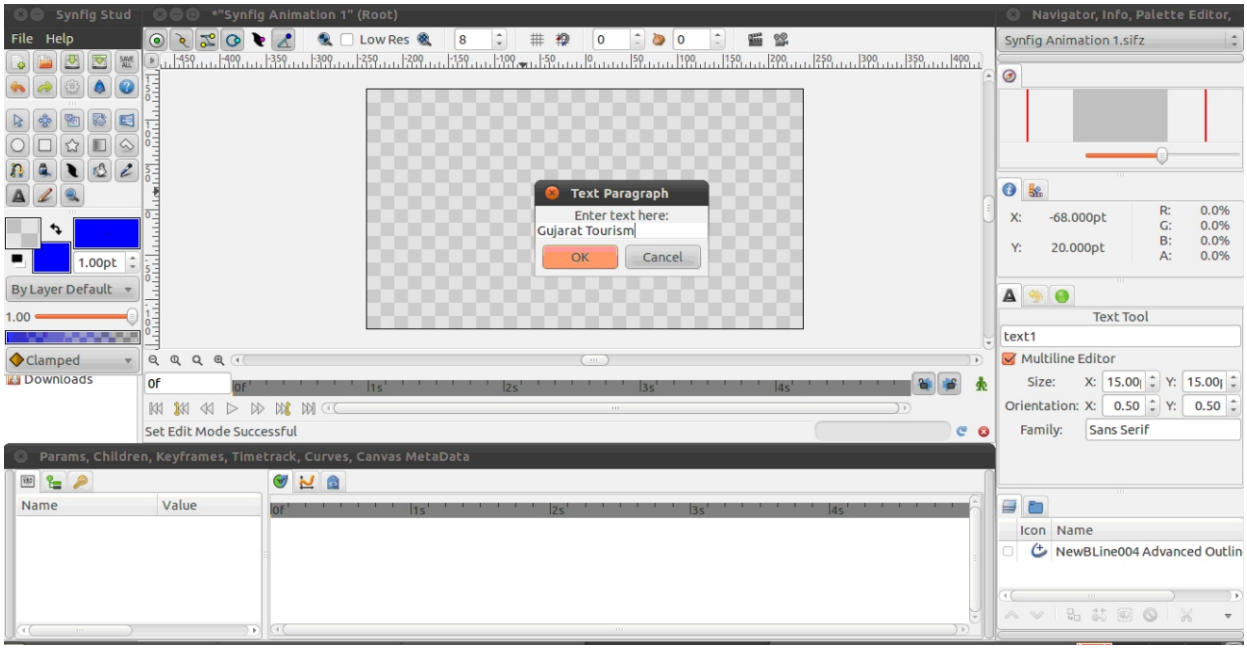


Figure 2.23(a) : Text layer dialog box

Figure 2.23 (b) shows a new text layer created along with its ducks. Using the parameter panel we can change the entered text later on according to our need.

Figure 2.23(b) : Text with ducks

The tool options panel will allow us to:

- Select the name for the new layer; this number will increment as we add new layer.
- Select single or multi line editor for entering the text. If single line is selected then click the enter key to submit the value while in multi-line editor, click the OK button to submit the value.
- Select the horizontal and vertical size of the text.
- Select the 'orientation' of the text. By default (0.5, 0.5) is selected which means that the text will be centered around the point you clicked on.
- Select the font family.

Zoom Tool

The Zoom tool is used to get a closer or far away view of the objects in the working area. The zooming does not affect the output results. It is used to just view the objects from close or far range.

Width Tool

The Width tool helps to increase or decrease the width of a line. It acts like the way you use pencil to make a line thicker or eraser to make it thinner. Select the outline layer to change the width on particular segment of a line, and then move mouse over that line, press the left mouse button and move cursor back and forth along the line. The width of outline will be increased at the places where you moved the cursor. To decrease the width hold "CTRL" key while moving the cursor. This tool is used to fine tune the line width.

Transform Tool

Transform tool allows you to select objects and to move, rotate or scale the ducks. Select the object on the canvas window and click the transform tool. If the object cannot get

selected as it is obscured by another layer then you can select its layer in the layer panel. This will display the ducks of the object. Select the duck and make the change according to your need.

Smooth Move Tool

Smooth move tool works just like transform tool, except when multiple ducks are selected. Select multiple ducks by pressing CTRL+a or dragging a rectangle around the ducks. Now when you drag one of the selected duck, the other selected ducks will also move along with it.

Scale Tool

Just as we discussed smooth move tool, here also when we select multiple ducks, and drag one of the selected ducks the other selected ducks will scale relative to the centre of the selected group.

Rotate Tool

As in smooth move and scale tool, when we select multiple ducks, and drag one of the selected ducks the other selected ducks will move rotating about the centre of the selected group.

Summary

In this chapter we learned about the authoring tools and its types. We have become familiar with the Synfig user interface and also learned to create a new file and set its properties. We discussed the purpose of each panel. The use of each tools along with the tool options were discussed. We can use these tools to create and manipulate the objects and then animate later on. So let us now learn to animate these objects. Having learnt functionalities of various tools available in Synfig, we can now proceed to create a multimedia animation using these tools.

EXERCISE

1. What are authoring tools? List different types of authoring tools.
2. What is the purpose of gradient tool? State the use of four types of gradient learned in this chapter.
3. Briefly explain the three palettes of toolbox window.
4. List the important panels and their function.

8. **Choose the most appropriate option from those given below :**

   (1) The elements are organized as pages of a book or pile of cards in which of the following forms?

   (a) card or page based tools
   (b) icon and event based tools
   (c) time based tools
   (d) animation tools

(2) Which of the following tool helps in changing the color of objects?

(a) draw (b) fill

(c) circle (d) rectangle

(3) Synfig Studio represents which of the following type of authoring tools?

(a) time based authoring tool (b) event based authoring tool

(c) page based authoring tool (d) icon based authoring tool

(4) Which of the following terms represents the number of palettes a toolbox window separated into?

(a) two (b) three

(c) four (d) five

(5) Which of the following is the file extension of a file created in Synfig Studio?

(a) .fiz (b) .sifz

(c) .zif (d) .fis

(6) Which of the following panel shows the currently selected layer parameter?

(a) layer (b) params

(c) timetrack (d) history

(7) Which of the following represents the colour of the duck used to change the radius of the circle?

(a) green (b) yellow

(c) orange (d) blue

(8) Which of the following tools is used to make objects with any number of points and curves?

(a) bline (b) circle

(c) rectangle (d) star

(9) Which of the following tools is used to create smooth transitions between two or more colours in an object?

(a) width (b) fill

(c) eyedrop (d) gradient

(10) Which of the following gradient produces simple transition in a straight line?

(a) conical (b) radial

(c) linear (d) spiral

(11) Authorware and IconAuthor are examples of which of the following types of tools?

(a) card or page based tools (b) icon and event based tools

(c) time based tools (d) animation tools

(12) Which of the following animation software lets you create traditional hand-drawn animation?

(a) pencil (b) synfig

(c) flash (d) director

(13) Which of the following are two important parameters of circle tool?

(a) centre, diameter (b) diameter, point

(c) radius, diameter (d) centre, radius

(14) Which of the following terms represent a handle used to control some parameter of the layer?

(a) point (b) tool

(c) duck (d) panel

(15) The duck used to change the position of the object has which of the following colour?

(a) green (b) blue

(c) red (d) yellow

(16) The layers visibility is controlled by which of the following operations?

(a) opacity (b) gradient

(c) interpolation (d) blend

(17) Which of the following tools allow you to enter text by creating a text layer?

(a) circle (b) text

(c) draw (d) fill

LABORATORY EXERCISES

1. Draw a circle, rectangle and star on the canvas. Select different color for each object. Also insert text as per the object.
2. Using Bline tool draw a candle.
3. Using appropriate tools draw a flower and a candle.