5 | Digital Content Creation (GIMP, Inkscape)

Introduction

Digital content can be in any form. We have different types of files, such as images, videos, audio, text files, software program files which can be compiled and made executable. Following is the list of contents along with its example

1. Images files

2. Blogs – HTML files with Images and Videos in it.

3. Audio Files – Mp3 and various other format files etc.

4. Videos files –

In this SOP we are going to learn GIMP, Inkscape

GIMP

GIMP (GNU Image Manipulation Program) was created in 1995 as a computer science project by students, Spencer Kimball and Peter Mattis. Today GIMP has become a very sophisticated software with plenty of documentation and support. GIMP is a Free and Open Source Software. You can freely distribute the program as well as its source code to any number of users. You can even study the source code and enhance it. GIMP runs on Linux and most of the other desktop Operating Systems.
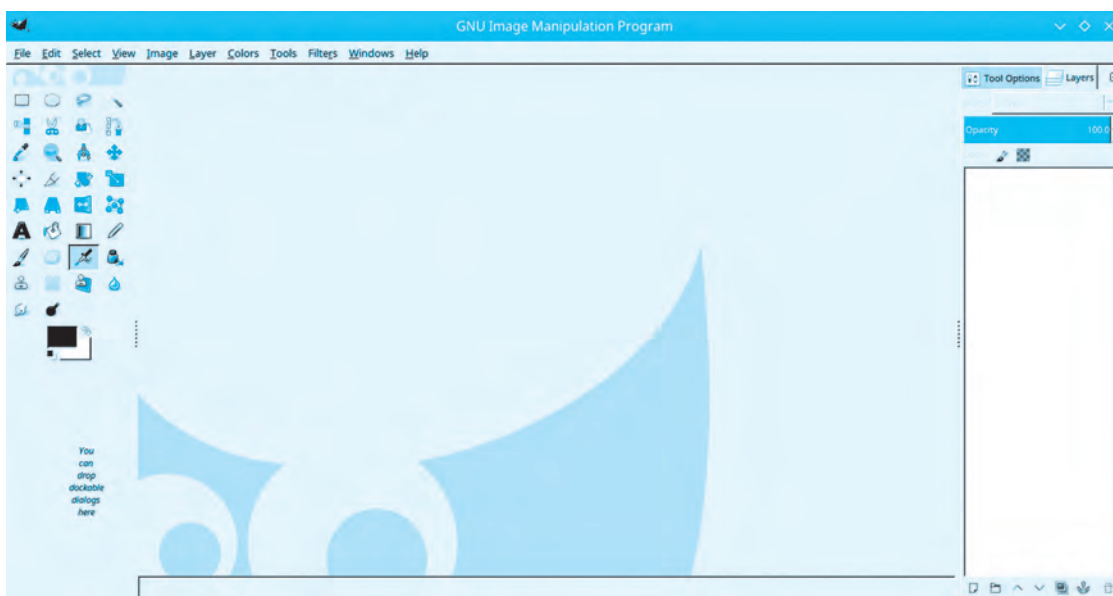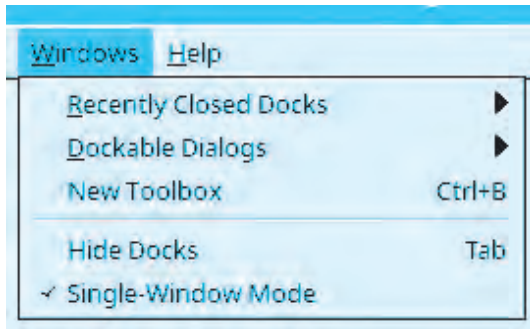

Fig 1 : GIMP Opening Screen

Gimp Opening Screen (The appearance may vary depending upon your version)

GNU/Linux distribution already comes with a GIMP package. Installing through package manager is a preferred method of installing GIMP, as the distribution maintainers take care of all the dependencies and bug fix updates.

GIMP is very easy to learn. The opening screen of GIMP is shown above. Please ensure that you use the '**Single Window Mode**' which is suitable for beginners. To do this, tick Windows -> Single-Window Mode if it is not ticked already.

Fig 2 : Single Window Mode Option

GIMP toolbox contains set of tools. These tools can be used to do various operations on images. Tool icons visually describe the corresponding operations. We will cover a few of them.

Students are required to explore the other tools by using them and referring to the GIMP documentation, manual and web tutorials which are freely available.

The most frequently used tool is Foreground and Background colour tool. The upper rectangle represents foreground colour while the lower represents background.

Fig 3 : GIMP Toolbox

Clicking on each of the rectangles gives a colour selection dialog from which users can choose required forground or background color. Note that each colour selection is represented by set of numbers. You can note down these numbers and reproduce the colour at any time.

Let us do a small activity. We will create a colourful baloon with some text on it.

Step 1 : Create a blank image, also called as 'Canvas'. File->New (or Ctrl+N).
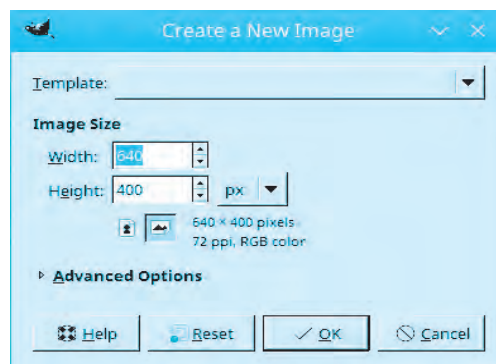

Fig 4 : Canvas Creation

We start with a new blank image of size 640 x 400 pixels. The new image will have white background and black foreground.

This 640 x 400 image will be the surface of our baloon.

We want our baloon to have very attractive colours. So let us fill the whole image area with some bright colour. We can use single flat colour or even mixture of few colours. Here we will use gradient colour. Gradient colour is a gradually fading mixture of two colours

Step 2 : Change Foreground and Background colour with colours of your choice. The tool will show you the colours you have chosen in the form of small icon.
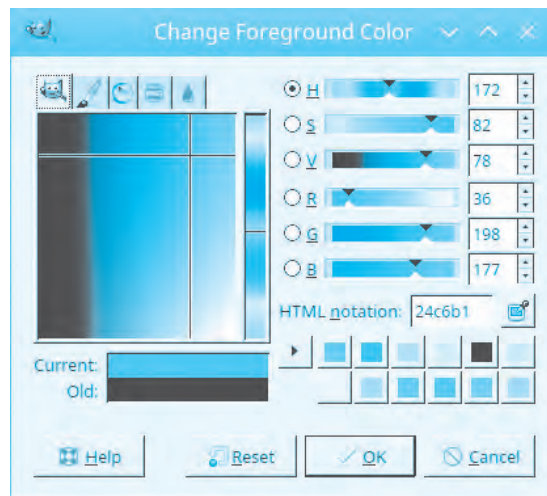

Fig 5 : Colour Toolbox

Step 3 : Now select the **Blend Tool (short cut L)** from the tool box and drag the mouse from left to right on your canvas. After you release the mouse, the canvas will be filled by the gradient of foreground and background colour. The baloon made up of this canvas will look nice. But we will decorate the canvas further by putting some text and coloured ovals on it.

Fig 6 : Gradient Color

Step 4 : Next click on Text tool (short cut T) The resulting dialog will give you various options to change font, font size, colour of the font etc. You can type text in the language of your choice provided that additional languages are added in Region and Language Settings of your Linux Distribution. You can refer QR Code to install Marathi Font.

BalBharatiDev01	49	px
	0.0	0.0

बालभारती
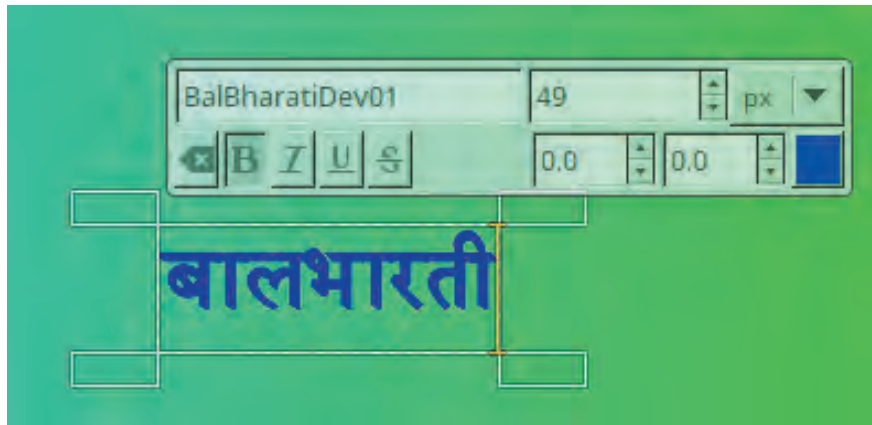
BalBharatiDev01 font can be downloaded from ebalbharati site (if required)

Fig 7 : Text Tool

Step 5 : After you are satisfied with the font, size and other attribute, press escape. Note that a new layer is created with the text you entered. As you add various objects like text,graphics,drawings etc to your image, new layers are created. This enables you to selectively move the objects and change their colour, size etc. Later you can merge down these layers into your main image.

Step 6 : Using move tool, we can move the text roughly to the centre of the image but instead we prefer to put it precisely in the centre, using the Align Tool. Click on Align Tool (short cut Q) and then select the Text layer and text. In the Align dialog, Select relative to image and click on Vertical Centre and then Horizontal Centre buttons. The text layer should now occupy the exact centre of the image.

Step 7 : Drawing coloured oval (Ellipse) : Change the background and foreground colours again with two different colours. We have chosen Red and Yellow respectively.

Create a new layer in your image. Now click on the Ellipse select tool (short cut E) and select the oval shaped area on the image. It will not have any colour. Use the menu Edit->'Fill with FG colour' to give Red colour to your oval. Similarly draw another one and fill with BG color.

Step 8 : Using move tool place these ovals near the Text. Do not move them too far from the center or they will go to the rear side of the baloon. Select the layers one by one and merge them using the command Layer->Merge Down. We now have a colourful single layer. Let us create a baloon from this canvas.

Fig 8 : Output till step 8

Step 9 : Do Filters->Map->Map Object. Select Map to Sphere, Check 'Update preview live' and Uncheck the 'Transparent Background'. This will give you a dialog showing the preview of the resulting balloon (sphere)

Press Ok and the image will now turn into nice balloon with 3D effect.

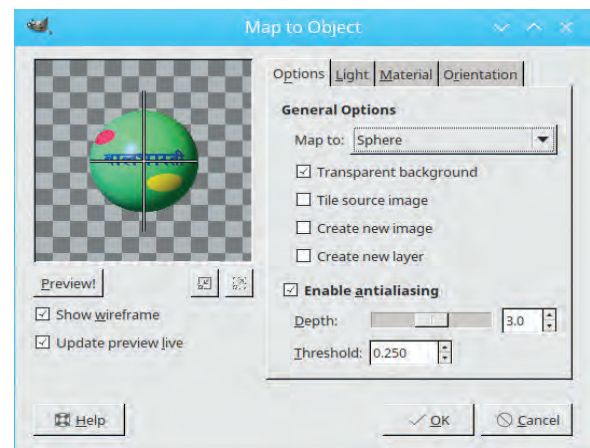The balloon is little elongated since our canvas was rectangular.

Fig 9 : Map to Object Tool

Fig 10 : Output for Step 9

Step 10 : We will tweak the balloon further and give it more realistic shape. Apply the Distort Filter with Curve Bend option. That is Filter->Distort-> Curve Bend. In the resulting dialog choose Automatic preview and Lower curve border. Then drag the Mid point of the Curve Indicator line using the mouse :
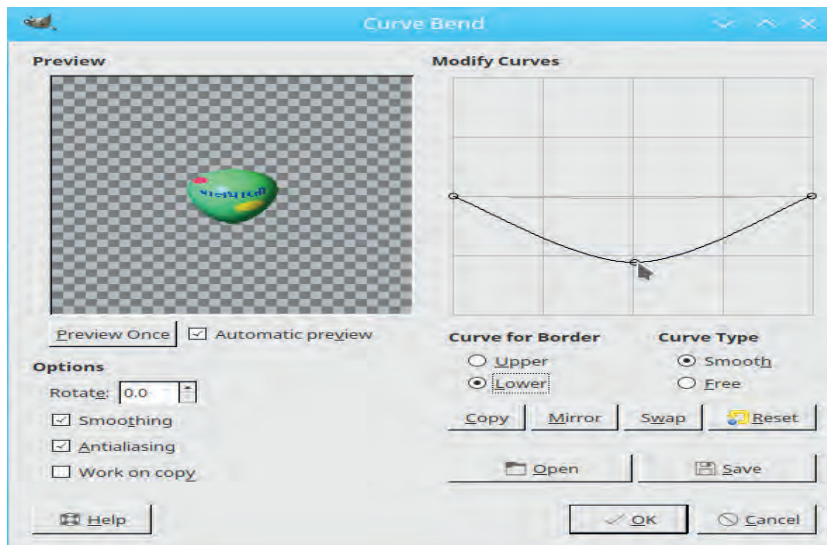

Fig 11 : Curve Bend filter Option

Press Ok and you will get a nice colourful balloon with 3D effect.

Fig 12 : Output for Step 10

Step 11 : Let us remove the unwanted portion around the balloon. To do this simply do Image-> Crop to content.

Fig 13 : Output after cropping

Step 12 : Finally export the image to PNG (jpg format does not support transparency) You can use this balloon as the object to other images. Open an image where you want to insert the balloon.

Fig 14 : Image for Step 12

File -> Open -> Image ->As Layer. Then move the balloon layer to the desired location and merge the balloon layer to the original image. Note that the transparent part is not visible. All images are rectangular in shape. Due to transparency our image appears to have balloon like shape.

Fig 15 : Output for Step 12

Inkscape

Inkscape is a free and open source software for creating vector images. Vector Images are stored as drawing rules and not as a set of pixels. Whenever we resize a vector image, the image is redrawn using the rules. Hence the resized images have the same quality as that of original images.

The image rules or descriptions are stored in xml format with the extension SVG (Scalable Vector Graphics). Inkscape is primarily used for diagrams, charts, graphs, illustrations, logos, icons, line arts, user interfaces of softwares etc.

Inkscape is availble on all major desktop operating systems. It is included in official repositories of all major Linux distributions. One can easily install it from package manager like Synaptic.
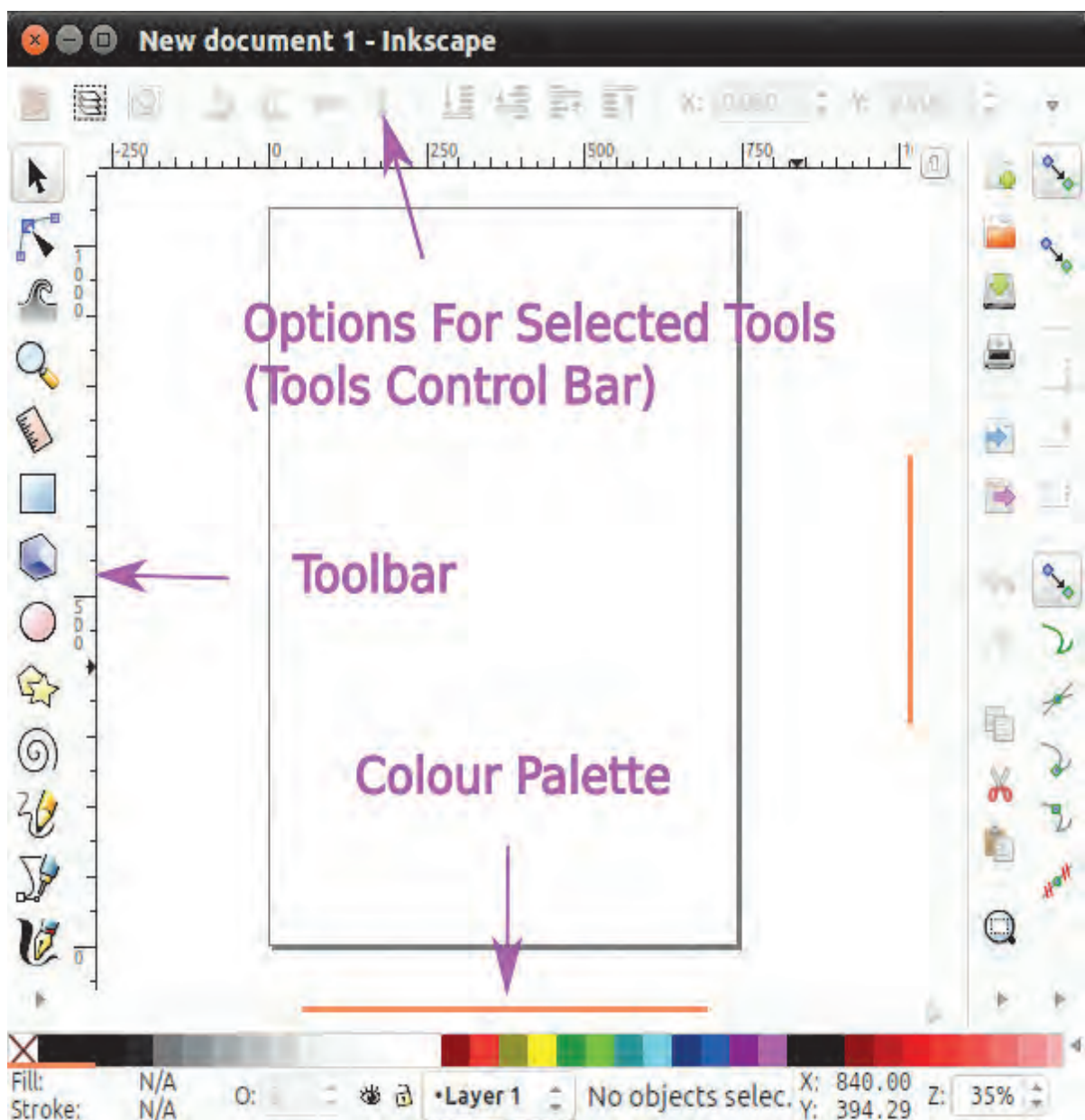

Fig 16 : Inkscape Opening Screen

The opening screen gives you a toolbar on the left. On the top you have a tool control bar. When a tool is selected, this bar shows various settings for the currently selected tool. The right side is reserved for additional dialogs such as fill and stroke align and distribute etc.

We will draw simple objects in order to learn basic skills using the given tools. We use only geometric shapes such as line, circle, ellipse, rectangle and square for these drawings. You might already have used similar tools in many other drawing and painting softwares. But Inkscape gives you far better control than most of the other softwares.

Circle/Ellipse Tool :

Let us start with Circle or Ellipse tool.
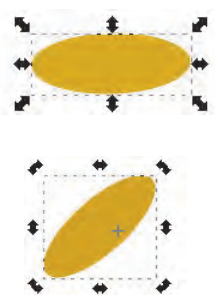
1) Select the tool button from left tool bar showing circle icon.

2) Drag it with the mouse to any place in the client area. You will get a circle or an ellipse from starting point to the end point where you release the mouse button. To get the exact circle, press the Ctrl key while dragging. This will guide you by snapping to the exact square.

3) After the ellipse is complete choose the selection tool (topmost from the left tool bar). Then click on the ellipse. The ellipse will then show 8 size handles. You can resize the ellipse by dragging these handles. Also clicking once again on it will turn the sizing handles to rotation handles. You can toggle between Size and Rotation handles.

Fill Colour in the object :

To fill the ellipse with colour, just click on any desired colour given in the bottom colour palette.

To choose more precise and accurate colours, use the menu Object -→ Fill and Stroke. This will give a dialog with a few tabs and also Red, Green and Blue (RGB) colour options. You can choose any combination of Red, Green and Blue to obtain very precise colour from it. Note that you have 0 to 255 that is total 256 choices for each of Red, Green and Blue so total 256 x 256 x 256 = 16777216 colours can be chosen.

Duplicate the object :

Using duplicate, you will get an exact copy of the object. Using Edit-→Duplicate (Shortcut Ctrl-d) you get exact copy of the same object. The duplicate will be at the same place so you need to move it in order to make the duplicate object visible.

Activity :

Draw different sized ellipses, fill them with colour, rotate and then move and position them in order to draw a simple object as shown below . Our example object is an animal made up of ellipses. A squirrel is shown using only ellipse. We have applied duplication of objects, colouring, rotation and order of objects at appropriate places. You can draw any other animal using simple objects.

Objects may overlap each other. This order of Objects can be changed by using menu Object -> Raise to Top, Lower to Bottom.

To draw line segments, use Bezier tool. After selecting the tool, click at starting point and drag with mouse to draw line , double click to finish the segment at desired point. Now to increase the line width, click on menu Object -> 'Fill and Stroke', while the line segment is selected. In the 'Stroke Style' tab, adjust the width.

To change the stroke paint, go to stroke paint tab in the same dialog and choose the desired colour. You may have to press shift at the time you click on colour in order to apply it. To draw a vertical or horizontal segment with precision, keep Ctrl key pressed during the drawing. This will correct the angle in steps of 15 deg as you move closer to the angle.
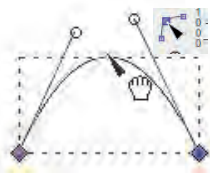
Using the node tool, transform the drawn segment into a curve. Select the tool and stretch (drag) the middle part of the segment. It will turn into a curve
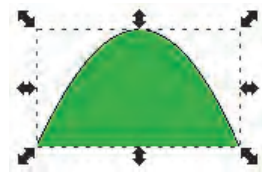
Let us fill this curve with a colour. It is very simple. Just select the object (curve in our case). Ensure that 8 sizing handles are surrounded by the object. Then click on the required colour. We have chosen Green colour. This will fill the region under the curve.
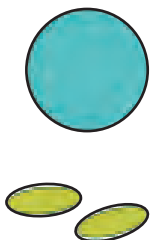
Now we draw a circle or ellipse. You are already familiar with this. Pick this tool from the left tool box and drag it on the canvas with left mouse button. Rlease the mouse button after you get the desired size of the ellipse. To produce exact circle, keep the ctrl button pressed. In the same way, rectangles or squares are drawn. We also draw two small ovals and fill them with a suitable colour.
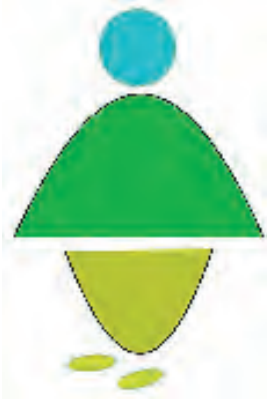
We will draw another curve by stretching the line segment downwards. Fill it with some colour and join these two curves.

Bring together these shapes to form a simple basic human figure. You need to select and move them in order to put them at proper places. You can use Edit->Duplicate (Shortcut Ctrl+d) for pair of feet.. Also use rotate handles to rotate the object. Sizing handles are converted to rotate handles on click and vice versa.
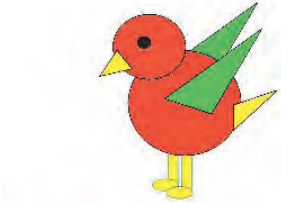
Here is another example. A small bird with colourful wings, tail, beak and legs. All the components are geometric shapes that are joined together. Legs and Wings can be drawn and duplicated.
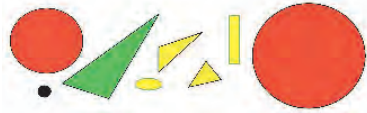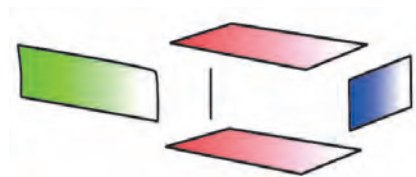
The adjacent diagram shows the drawing components used to make bird.

Gradient in Inkscape :

Let us now learn another concept in colouring, the Gradient. Gradient is a gradual mixture of colours. Gradients are used to give special effects to paintings. Gradients look attractive. They often give a kind of depth to the shapes.

Activity to draw a staircase :

1) Draw a parallelogram using beziar tool. Ensure that the last node will coincide with the first. This will make the region closed.

2) Now choose a plane colour to fill this region. We have chosen red. Go to menu Object->Fill and Stroke. Ensure that the region is filled with proper colour and the Fill tab is selected.

3) Finally click on Gradient tab. The region is now filled with red gradient slowly fading towards the other end with white colour. This is the upper surface of a staircase step.

4) Duplicate this object and move a little down words to get the bottom surface.

5) Next draw another paralelogram of appropriate size for the front surface. Fill this surface with Green Gradient.

6) We do not require the rear surface. A small edge may be drawn instead to indicate the rear surface of the step block.

7) Join all components. Completed single staircase block is shown in the adjacent figure.
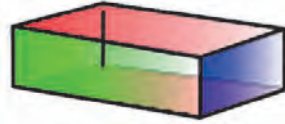
**8)** Finally take multiple copies of this block and make a staircase object.
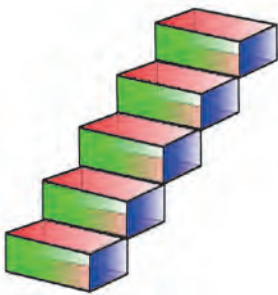
Always ensure that the desired color is filled in the region of the object before selecting gradient tab.

When duplicate is created it will be placed just above the original object. Select and move it immediately from its place to avoid multiple copies one below the other. This will unnecessarily increase the size of the image.

Palette gives only the standard set of colours. You can use Fill and Stroke dialog and RGB model tab to adjust the colour with more accuracy. There are CMYK and other models to select the colour. Study of colour models is beyond the scope of this text book. Students are encouraged to study this advance topic.

Activity to draw a simple flower :
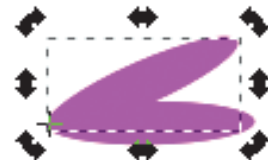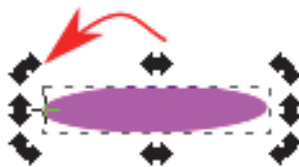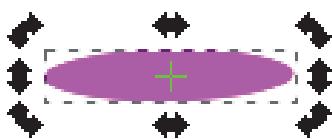
1) Draw one elongated ellipse. This is a petal of our flower.

2) Fill with pink colour.

3) Click on it to get sizing handles. Again click it to get rotation handles. Look carefully at the center of the ellipse. There you will find the center of rotation. If you try to rotate this petal using the handle, it will rotate around this center. We will move this center to left corner. To do this just drag it with mouse.

4) Now duplicate the petal (Ctrl+D). This operation will also copy the new location

of the center. Now if you rotate the petal. It will move along its corner like needles of the clock.

5) Duplicate and move these petals successively to get complete round of petals resulting into a flower.

6) We can decorate the flower further by adding colourful center. Draw a circle. Fill it with a bright colour, say red. In the fill and stroke dialog, increase the stroke width in stroke style tab. Choose a different stroke paint, we have chosen yellow. Now move this circle to the center of the flower.

7) Finally, we attach a stem to our flower. There is a calligraphy tool. This tool a used to write stylish text. This is a kind of angled pen. As you change the direction of the stroke, the width of the stroke changes. Draw a smooth curved stroke as shown. Also draw two ellipses for leafs. Give green colour to these objects. Use duplicate the leaf and use flap command to avoid repetitive work.
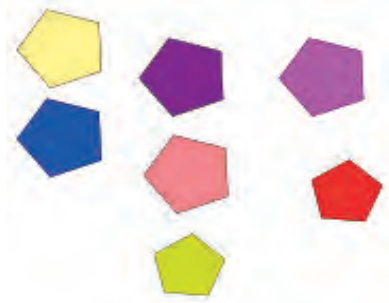
8) The completed flower is shown in the adjacent picture. Gradients can also be used to colour the petals. You can see in another example, the petals are coloured with yellow and orange color gradients. Try to draw different flowers and find out more tools that can be used for creating flowers.
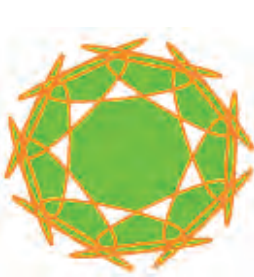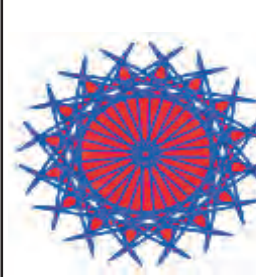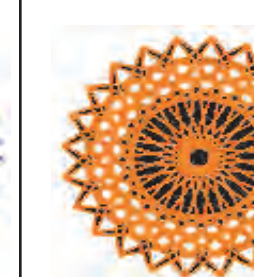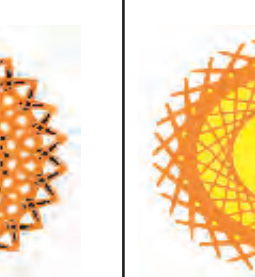
Activity to draw Star and Polygon :

The next tool that we are going to try is Star and Polygon tool.

1) Open this tool. You can switch between star and polygon by the buttons given in this tool's settings.

2) Drag Stars or Polygons of various sizes. One fascinating thing about star tool is that the underlined algorithm can produce different design patterns as you change basic parameters which create the star. Try experimenting on number of corners, spoke ratio and rounded setting.

| Corners : 9	Corners : 16	Corners : 24	Corners : 24
Spoke Ratio : 0.608	Rounded : 0.050	Randomized : 0.128	Spoke Ratio : 0.560
Rounded : 5.010	Rounded : 4.600	Rounded : 5.010	Rounded : 6.990

Activity to draw a Snail :

Just below the star tool, there is spiral tool which can be used to draw the spirals of all sizes and styles. You can set number of turns and also the other parameters. Let us use spiral object to draw an interesting object, a snail. The shell of a snail has spiral pattern.

1) Draw a spiral and increase the stroke width.

2) Draw ellipse for body of the snail and use appropriate tools for other parts.

3) Draw traingle as a tail, small circles as eyes, rectangle & filled circel as antenna of the snail.

Activity to draw a Car :

We will now take a look at the Simplify path command. This command gives smootness to the curve. The edges or corners are removed and replaced by smooth curve. It is a recurring process, that is you can give the command Path -> Simplify (Shortcut Ctrl + L) repeatedly till you get the desired result.
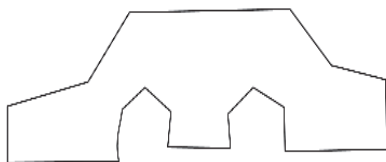
As an activity, let us draw a simple car object using bezier segments.
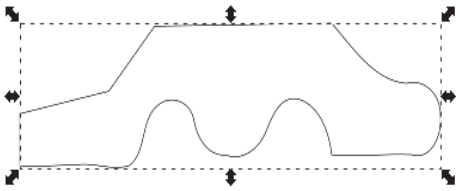
1) Using Bezier tool, draw an outline of a car by using a series of segments. Close the outline by choosing the first node as last node.

2) Now select the car outline and press Ctl+L (Shortcut for Path -> Simplify. Corner nodes will slowly turn into curves. You can stop when desired seamless shape is obtained. In case you go ahead and smooth it more than required, you can always press Ctrl+Z (undo)

3) After you get the outline in good proportion,colour the car.

4) Create two wheels (circles) with thick stroke.

5) Give appropriate fill and stroke colour.

6) You may draw some strips to represent street. You may need to order the object using Object -> Raise to Top, Lower to Bottom.

Activity : Move the mouse pointer on the toolbar and identify the tools. Make a list.
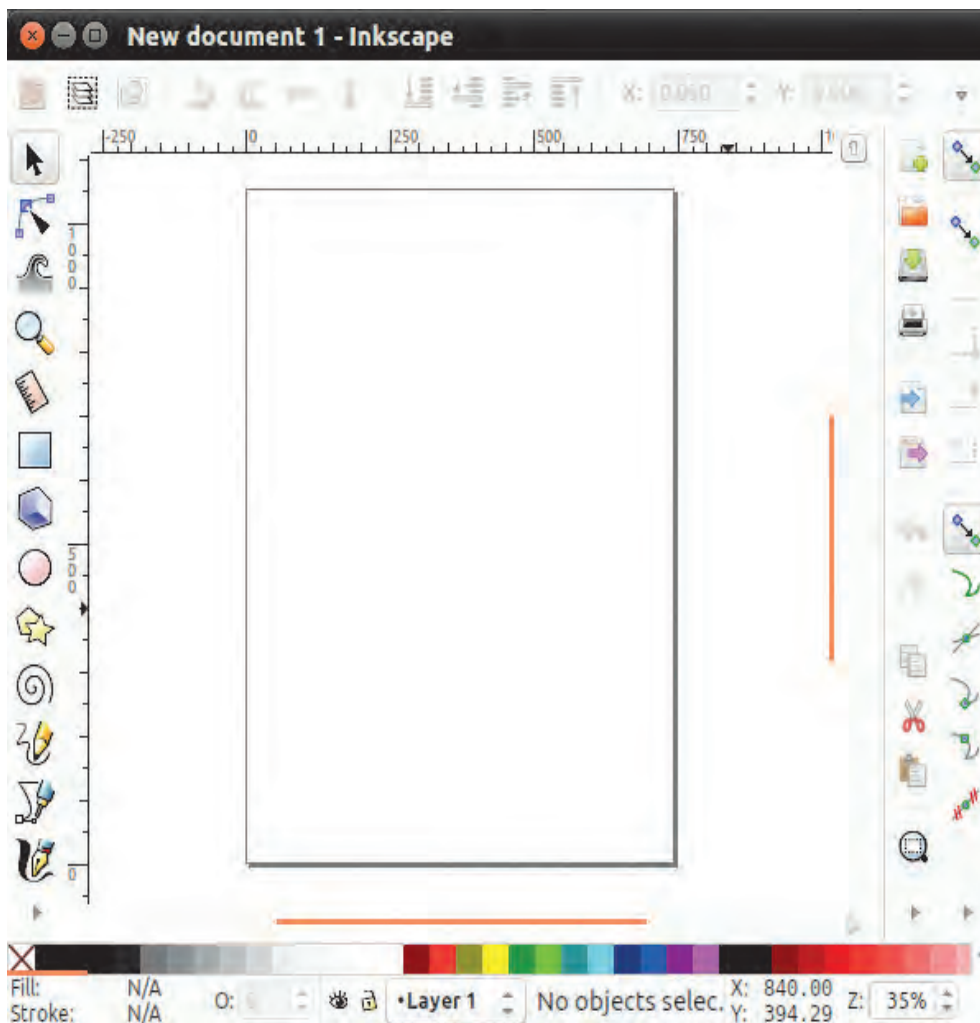
Skill Set 5 - Digital Content Creation

SOP 1 :   Use of Toolbox and editing an image using GIMP.

- Create an image by using Toolbox controls from GIMP.
- Insert the image in an already created image.

SOP 2 :   Use GIMP for the following.

- Create a new image
- Put your name using the text tool.
- Use various filters to make a logo of your name.
- Autocrop image to text size.

SOP 3 :   Use Inkscape for the following.

- Draw a simple landscape using basic geometric shapes.
- Use gradient tool for the same.

SOP 4 :   Use Inkscape for the following.

- Load an Id size image,
- Make 12 copies of it.
- Arrange in 4 rows x 3 columns on an A4 size page.

SOP 5 :   Use Inkscape for the following.

You are starting a new business.

- Create an advertisement to be published in local newspaper promoting your product or services.
- Size should be 210 x 210 mm.
- Create your own visiting card using inkscape.

SOP 6 :   Using Inkscape make the following picture.

○○○