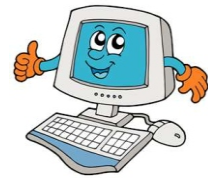


3

Creating Animation Using Synfig



In previous chapter we discussed about the Synfig Interface. We also saw how to use different tools to create and manipulate the basic artwork. Let us now learn how to create an animation. As we have discussed earlier, animation is a visual change over time. In other words, it is the sequence of images displayed one after the other in a given time frame. Let us discuss some basics of animation.

Animation

Animation is a visual change over time wherein the digital images are played one after the other to create a moving effect. The images used in animation can be first created and then displayed in a sequence. This type of animation is known as frame by frame animation. Frames are defined as the length of time in the document. Each frame consists of some objects to be displayed over a period of time. Hence in frame by frame animation, each small change in the image is created and then displayed in sequence. This method is slow and tedious. It also requires lot of time and resource.

The other simple way to create animation is through keyframe. A keyframe is a frame in which we define a change to an object's properties. Using keyframes you need to specify the first position and the last position of the object. The in-between frames are automatically understood and need not be specified. For example, say we want to show a circle moving from left to right. Here you need to create the first keyframe on the left and include the last keyframe on the right. The series of frames in between are drawn automatically. This effect is known as tweening. Tweening is an action which calculates the number of frames between keyframes and path of the action. This type of animation is known as cel animation and the computers generally employ this type animation. The real difference between varieties of animation software is how much to be drawn by the user and how much is automatically generated by the computer.

Another type of computer animation is known as kinematics. It is the study of movement and motion of objects that have joints such as walking man or running leopard. In some animations we can use an effect known as morphing, wherein the image transforms into another. Say for example you must have seen that a person's face transforms into another face and so on. Many products are available in the market that supports this type of effect.

Creating Animation

Now let us create our first animation of a circle moving from left to right. Follow the steps given to create this animation:

- Start Synfig (or Select Application → Graphics → Synfig), this will automatically open a new file for you.
- Click the Caret → Edit → Properties. This opens the canvas properties dialog box as shown in the figure 3.1.

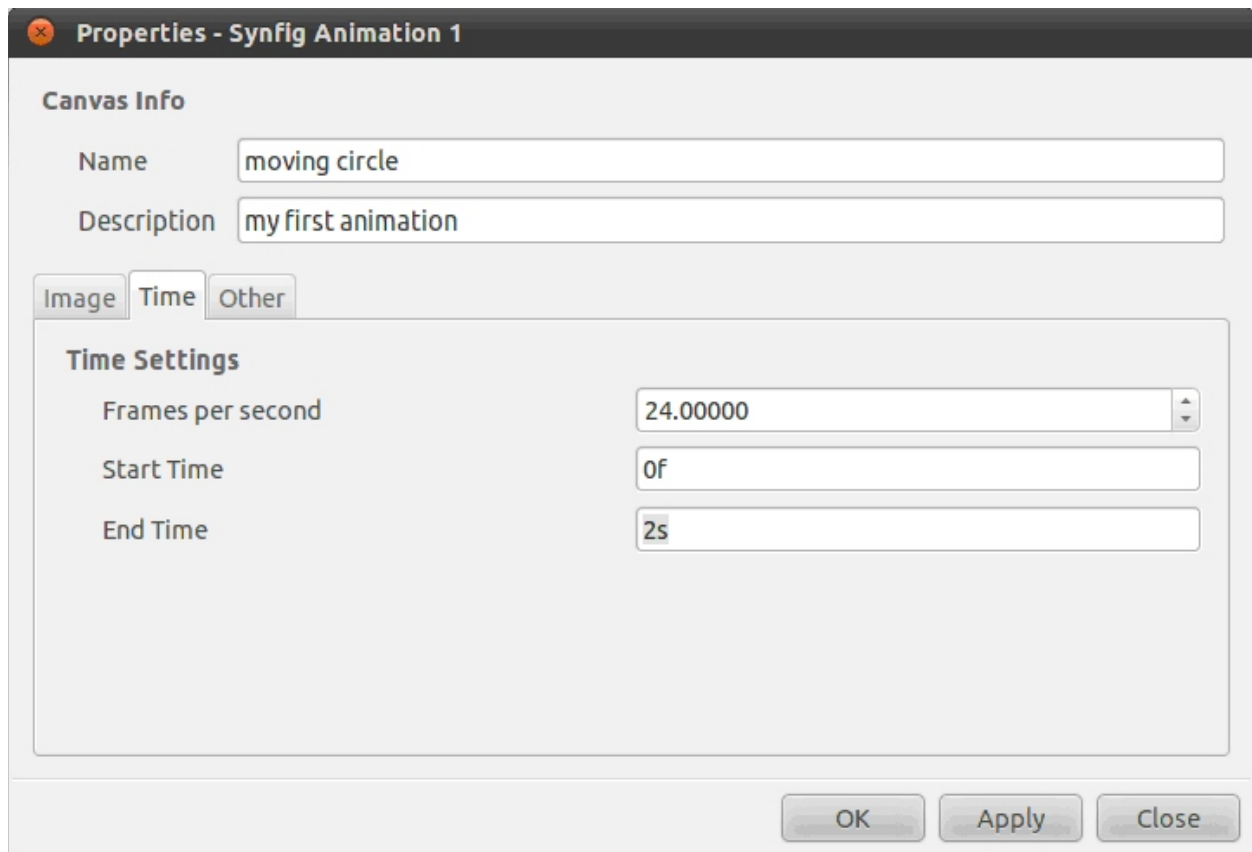


Figure 3.1 : Canvas property dialog box

- Give a name and description to your first animation. As shown in figure 3.1 we have given the name to our animation as “moving circle” and description “my first animation”. Now click on Time tab and change the End time to 2s. It means that our animation will be of 2 seconds duration. By default the End time is set as 5s.
- Click Ok. This will close the canvas properties dialog box and the changes we made can be seen as the file name has changed and the timeline is now 2s long.
- Now we need to draw a circle. Select the color of the circle by clicking on foreground color or using the palette. We can also change the color later by using the parameter panel. Currently we choose the fill color as yellow. Then select the circle tool and create a circle as shown in figure 3.2. You can use the transform tool to make changes in the circle drawn.

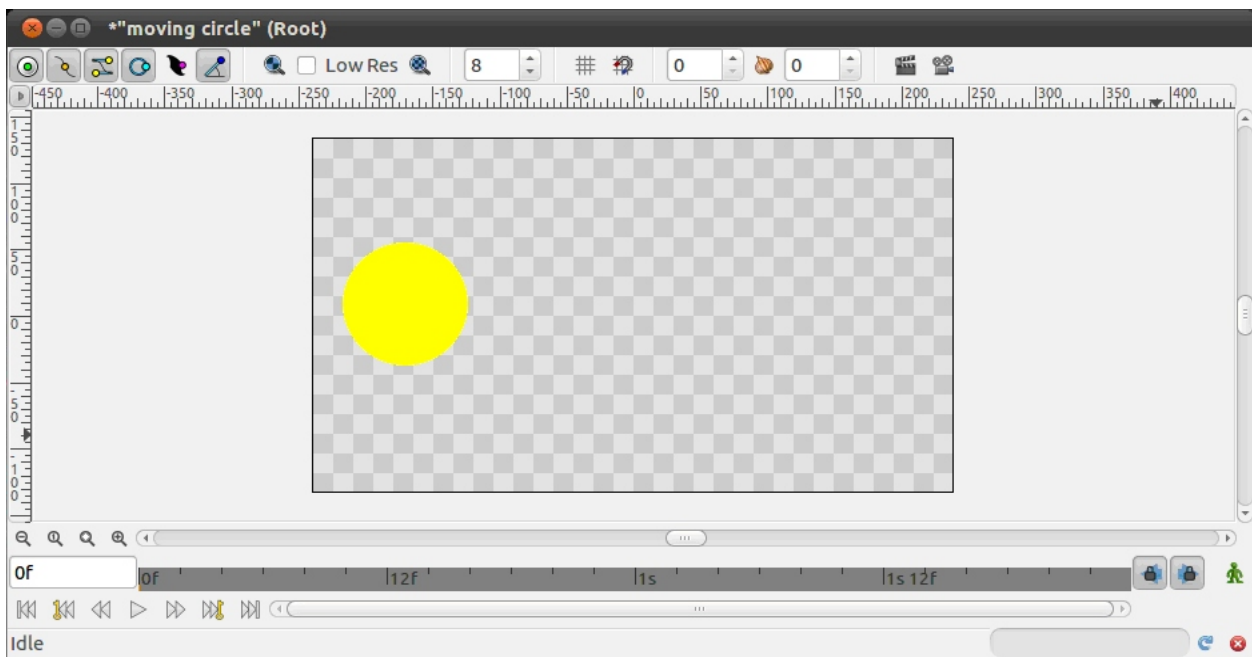


Figure 3.2 : Use of circle tool

Now we are ready with the object that is to be animated. Before starting with animation let us understand two important things: Timebar and Animate editing mode.

Timebar

As shown in figure 3.3 click on the timebar, you can see the orange indicator showing the position in time. Clicking at various points, you can see values “0f, 1s, 1s 10f” etc. in the entry field. You can also type the position in the entry field and press Enter, the indicator will take you to that position in timeslider. These values indicate a specific point on the timeline in terms of seconds (s) and frames (f). By default each second is divided into 24 frames. As you can see in figure 3.1 frames per second (fps) is set as 24. The frame starts at 0 and goes up to 24. For example, when one second and thirteen frames have passed, the entry box displays “1s 13f”.

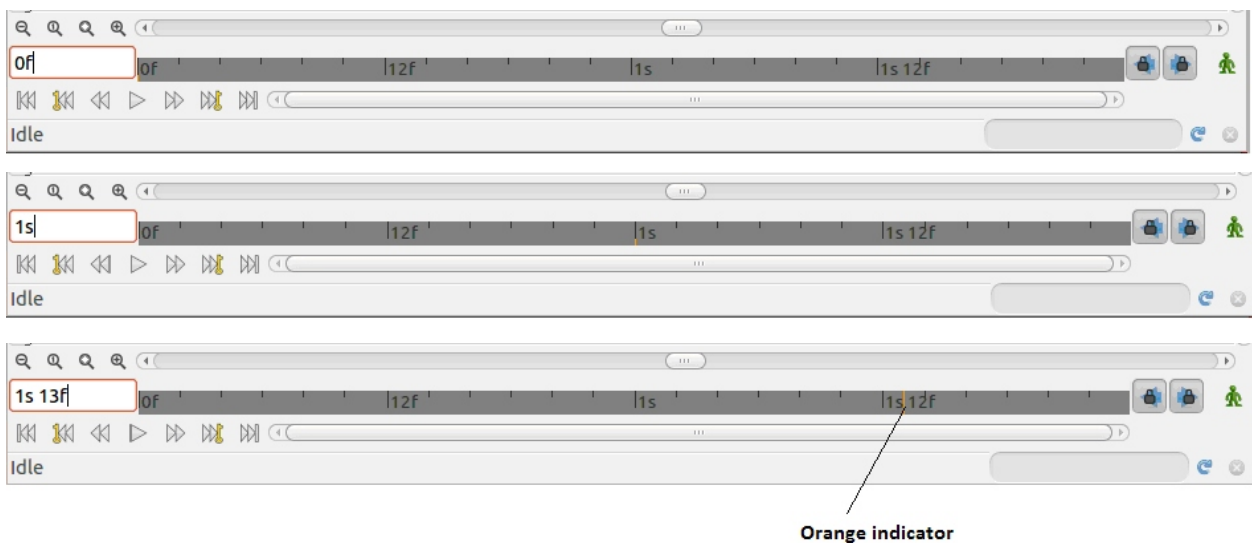




Figure 3.3 : Timebar with the indicator at 0f, 1s and 1s 13f

Animate editing mode

On the right side of the timebar shown in the figure 3.3, you can see a green button (). It will be visible if you have a non-zero end time. Clicking on this button, turns it into red button () and the canvas displays a red outline as in figure 3.4. This means that now the animate editing mode is active and any changes made will have an effect on the animation in the timeslider.

In animate mode, whenever a parameter of an object is changed, a waypoint is created to remember the change in the position and the time on the timeslider at which the change happened.

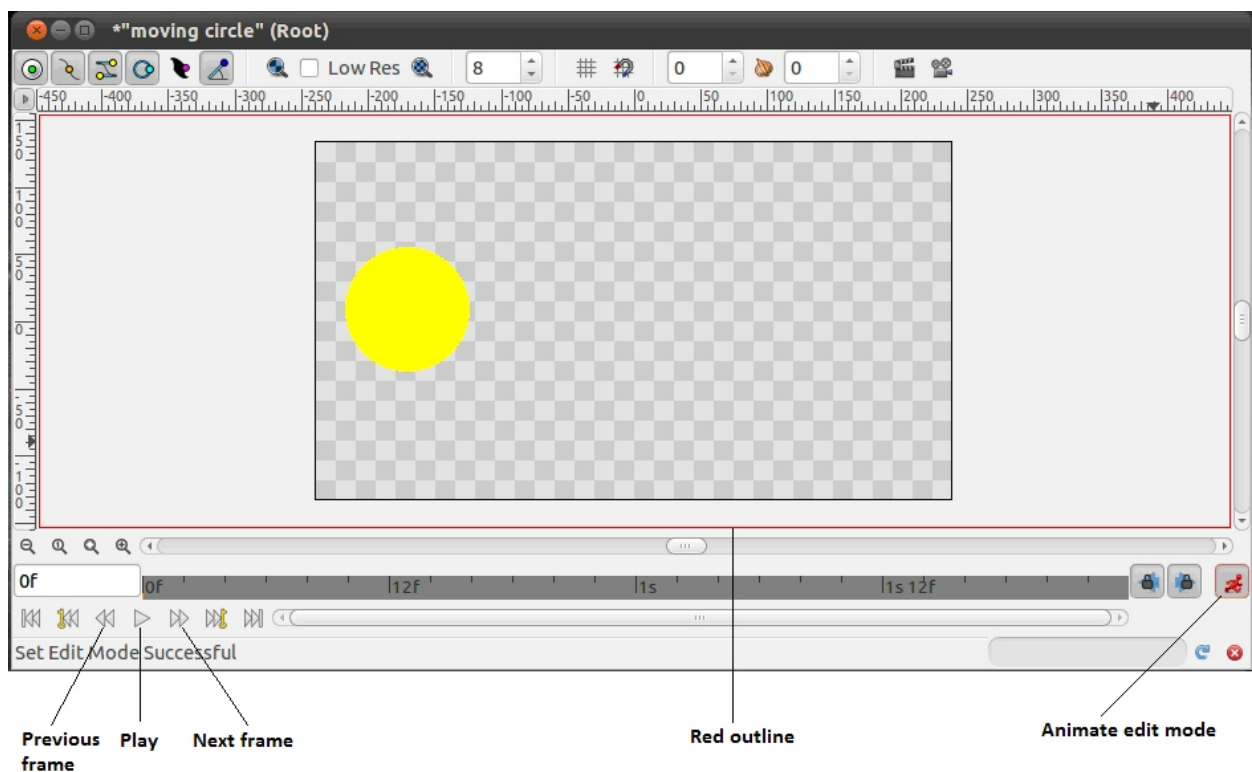


Figure 3.4 : Animate editing mode

When not in animate editing mode, changes to a parameter are applied throughout the entire timeline of the animation.

- Let us now start creating our animation. Click on Animate editing mode.
- You can see “0f” in timeline entry field. Move the circle slightly so that it records the location for the first frame. You can also move the circle to a new location on the working area as the starting point.
- Now click at the end of the timeline. This will show the ‘2s’ mark in the entry field. You can even type ‘2s’ in the entry field to reach the end of timeline. Grab the circle

and hold the shift key to move it in a straight line to the right of the working area as shown in figure 3.5.

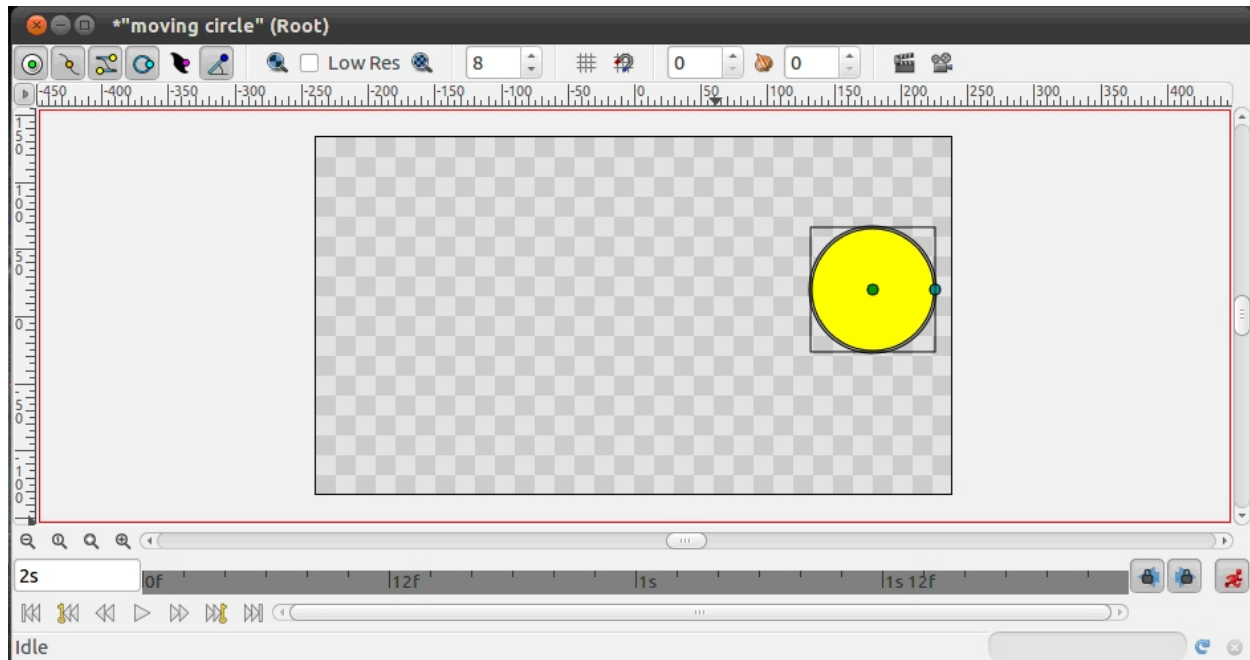



Figure 3.5 : Moving the circle to the right

- Click on any position on the timeslider and you will see the circle on a new position. We had specified only the beginning and the end locations of our circle, but Synfig has automatically created the in-between images or frames. As we discussed earlier, this process is known as tweening. These frames when displayed together will give an effect of moving circle.
- Click on the play key as shown in figure 3.4 to see how our animation will look. You can also click on the previous frame and next frames buttons to see frame by frame animation.
- Finally we need to render our work. Rendering means the computer uses various algorithms to apply the final effects you have specified on the objects created.
- Before rendering, click on the  button to leave the animate editing mode.
- Click on Caret → File → Save. Save the file by the name “moving-circle.sifz”.
- Click on Caret → File → Render. Change the filename to “moving-circle.gif” and the same location where you saved “moving-circle.sifz”. Select target format as “gif” instead of “Auto”, then click Render as shown in figure 3.6 (a). It will take few seconds for the file to render. You can see the message “file rendered successfully” on window status bar located on the bottom of the window.

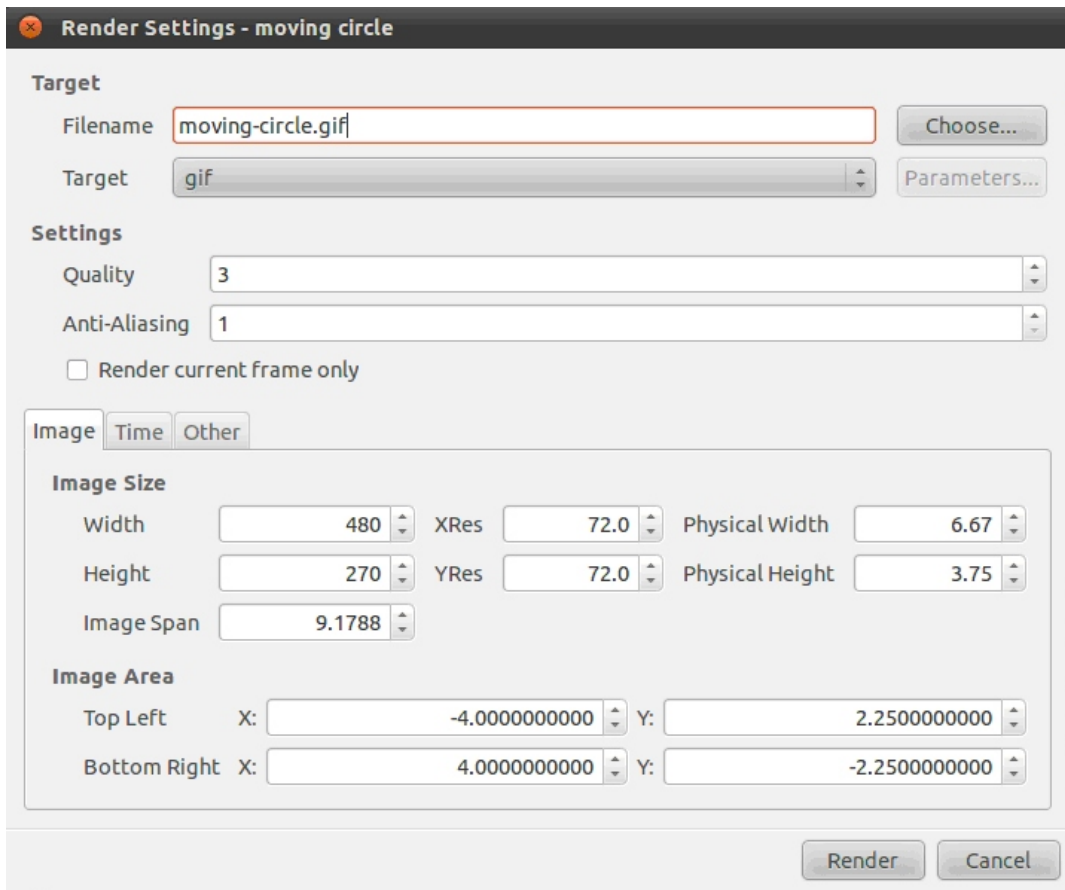


Figure 3.6(a) : Render the file

- Open moving-circle.gif file in a web browser or image viewer to see your animation. Figure 3.6 (b) shows the output as visible in the web browser.

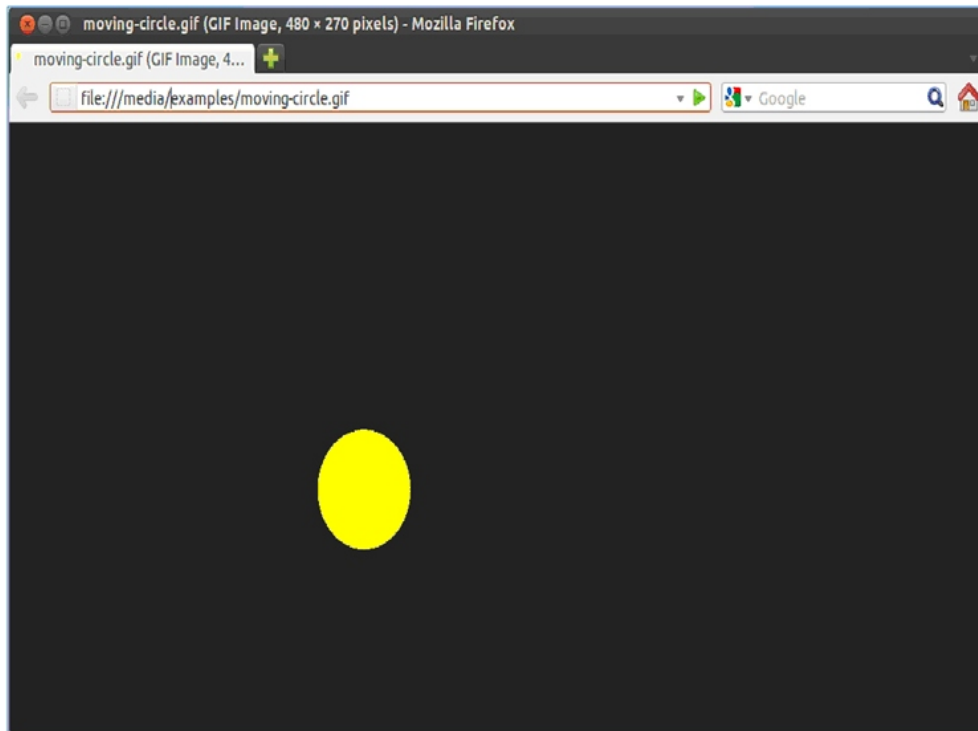


Figure 3.6(b) : Output displayed in web browser

Good. So, you have created your first animation.

Animation using keyframe

Let us create an animation of moving the circle from left to right and then left again using keyframes. For this we need to create following three steps:

- First the circle is on the left.
- Second, the circle is on the right.
- And third, the circle is back on the left.

Follow the steps given to create this animation:

- Start Synfig and open a new file.
- Click the Caret → Edit → Properties. Give a name and description to your animation. As shown in figure 3.7 we have given the name to our animation as “moving circle2” and description “moving circle using keyframes”. Now click on Time tab and change the End time to 2s. Click OK to make the changes.

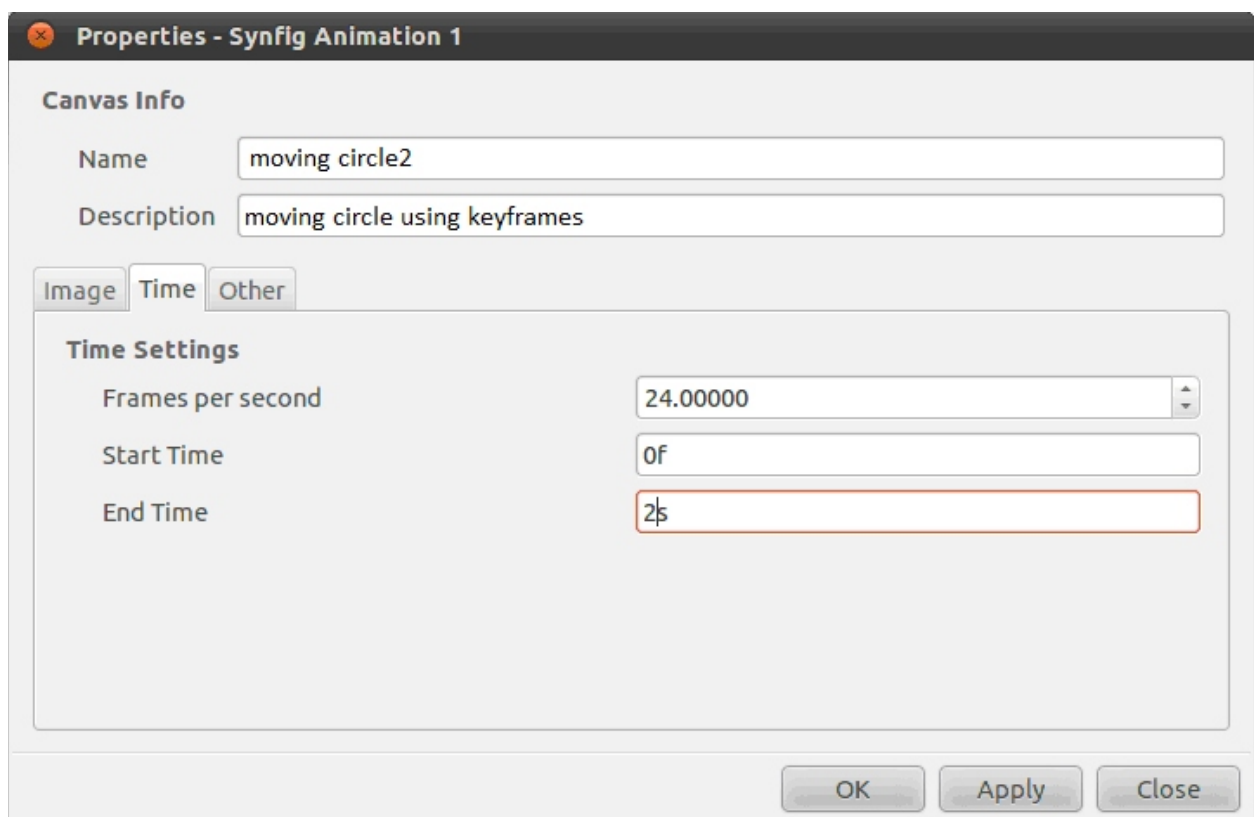


Figure 3.7 : Canvas property dialog box

- Now let us draw the background for our animation. Select the rectangle tool and create a simple black rectangle as shown in the figure 3.8.

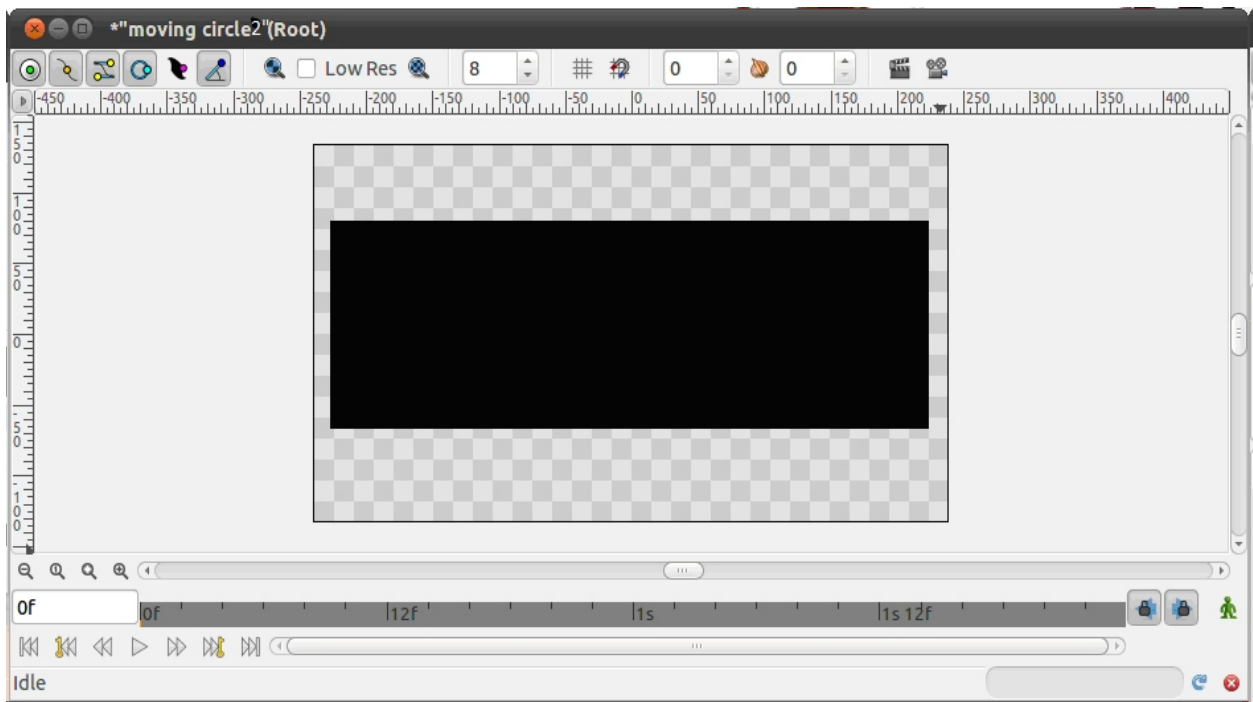


Figure 3.8 : Rectangle drawn using rectangle tool

- Now we need to draw a circle. First change the fill color to green. Then select the circle tool and create a circle as shown in figure 3.9. You can use the transform tool to make changes in the circle drawn.

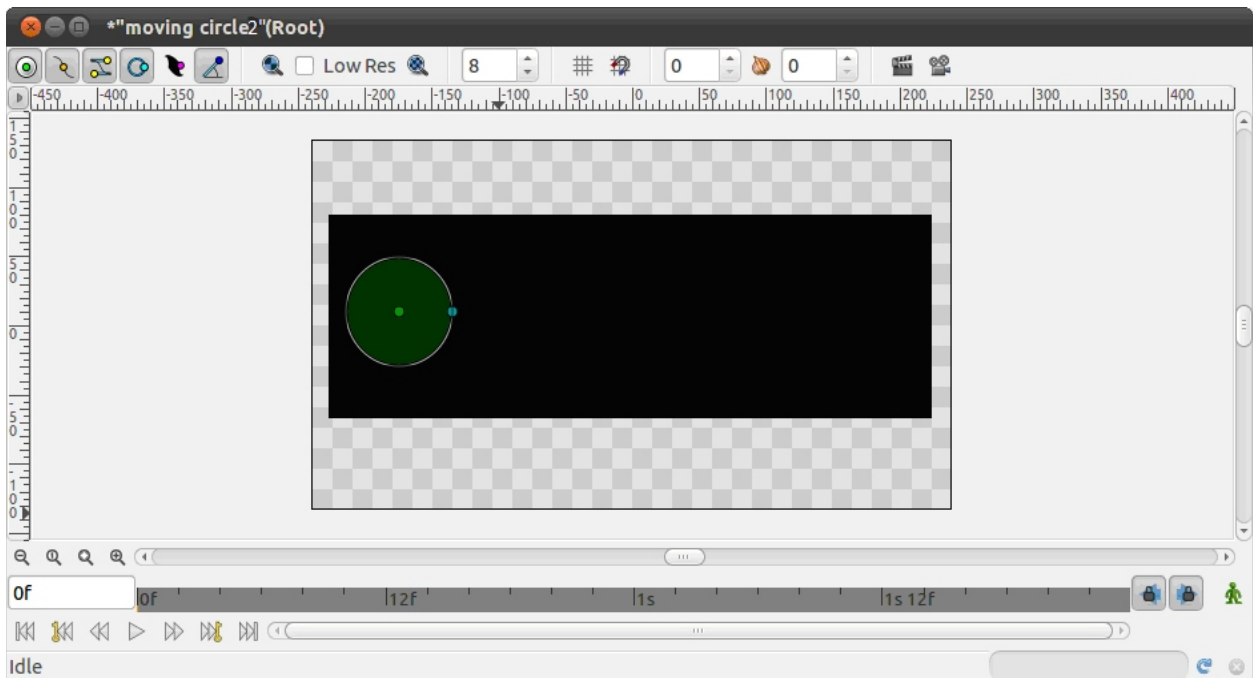




Figure 3.9 : Circle drawn using circle tool

- As the object is ready let us now start creating our animation by clicking on Animate editing mode.

- Go to parameter panel and click on  to open keyframe panel to add keyframes. Earlier we discussed the three steps; these will now become our keyframes. Click the small button  to add a new keyframe as shown in figure 3.10. This will make a new entry in the list displaying “0f, 0f, (JMP)”.

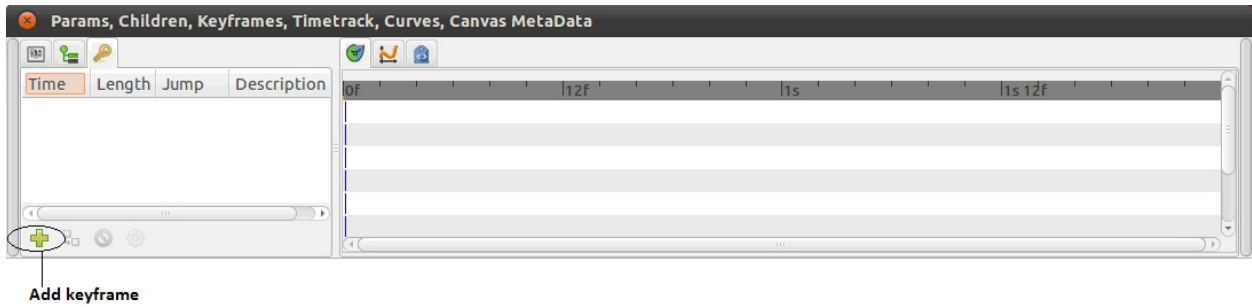



Figure 3.10 : Keyframe panel

- Go to the “1s” mark in the time slider. Click on  to add another keyframe. Again go to “2s” in the timeslider and add another keyframe. So now you have three keyframes in the list as shown in figure 3.11.

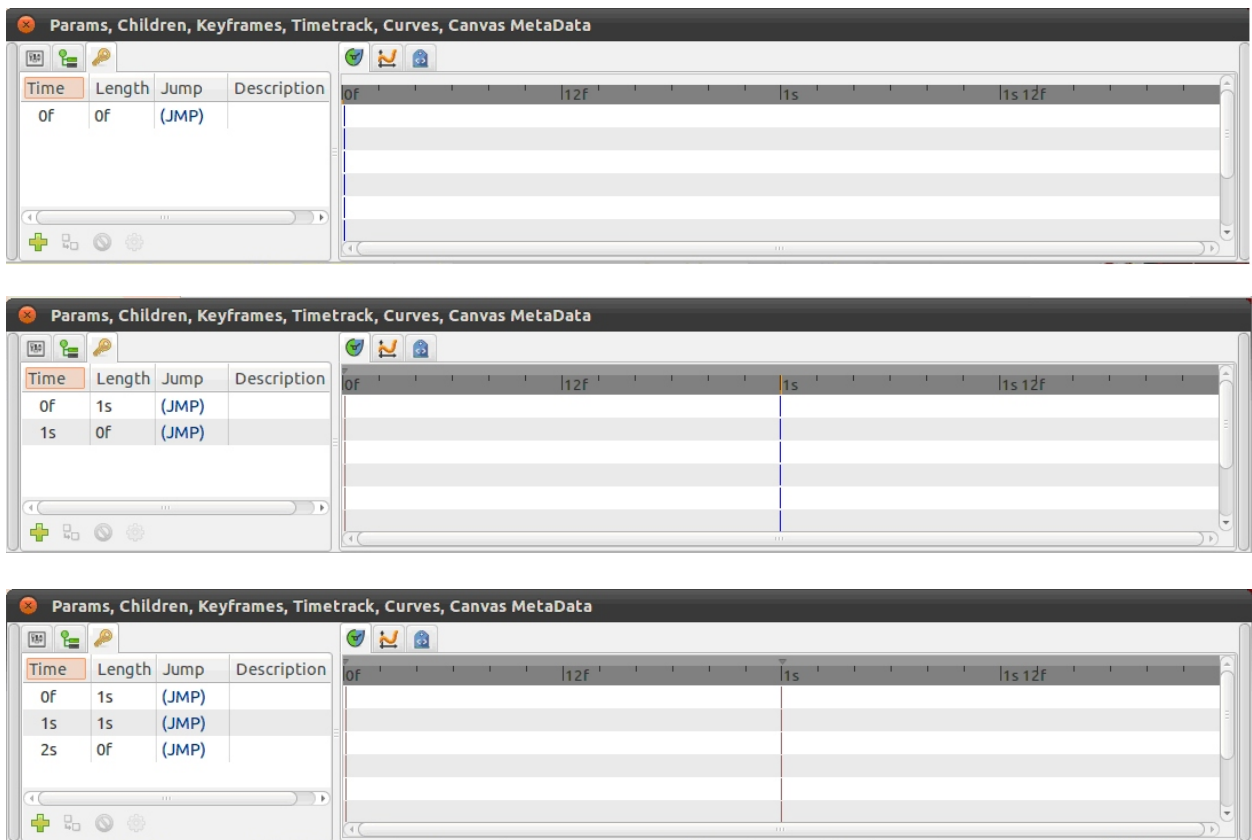


Figure 3.11 : Three keyframes at 0f, 1s and 2s

Let us understand the keyframe panel. It displays “Time” which indicates the start time, “Length” which indicates duration, “Jump” which are links used to jump to correct time and “Description”.

- Here, in all the three keyframes the circle is on the left. But as discussed in our steps the second position of the circle is on the right. So now let us edit the circle at second keyframe i.e at 1s mark. Click on the “(JMP)” of 1s mark and move the circle from left to right as shown in figure 3.12 (a). So finally, we have our circle at 0f on the left, then at 1s we have it on right and on 2s we have it on left again. On the Timetrack panel you can see three orange diamonds known as Waypoints as shown in figure 3.12 (b). They represent the time at which the parameter (like color or location) of the object changes.
- Click on any position on the timeslider and you will see the circle on a new position. We specified only three locations of our circle, but Synfig has automatically created the in-between images or frames. These frames when displayed together will give an effect of moving circle.

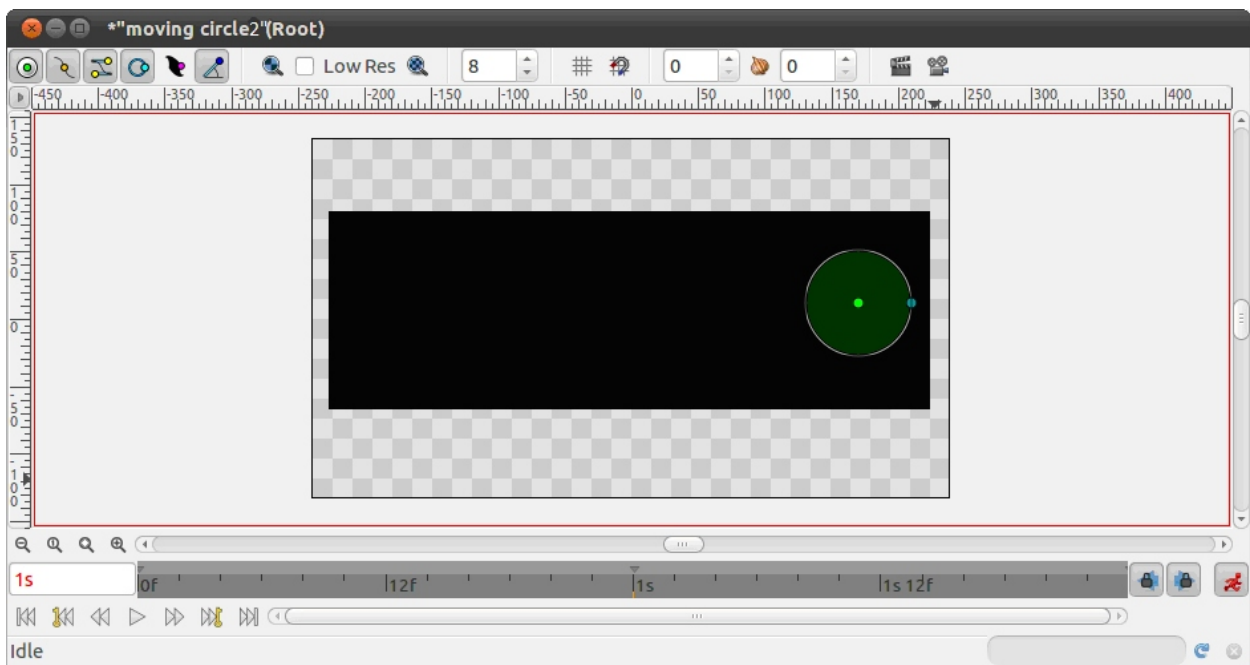


Figure 3.12(a) : Moving circle at 1s to its right

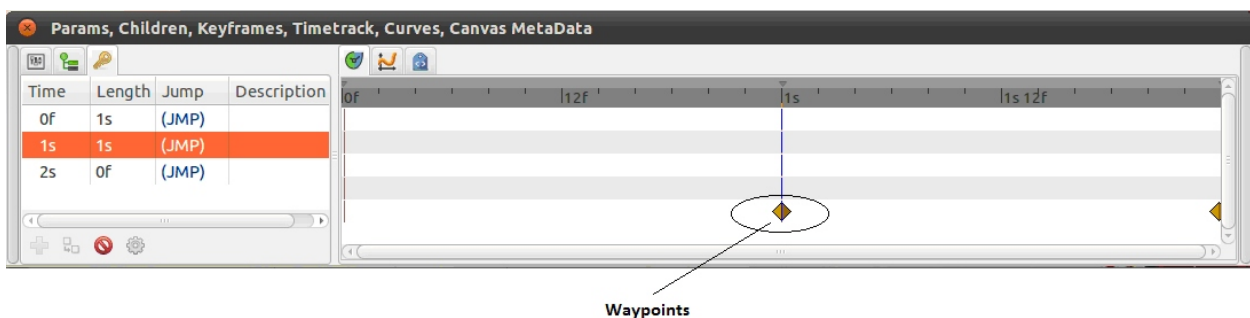



Figure 3.12(b) : Waypoints

- Now to see the animation we need to render our work.
- Before rendering, click on the  button to leave the animate editing mode.
- Click on Caret → File → Save. Save the file by the name “moving-circle2.sifz”.
- Click on Caret → File → Render. Change the filename to “moving-circle2.gif” and the same location where you saved “moving-circle2.sifz”. Select target format as “gif” instead of “Auto”, then click Render as shown in figure 3.13 (a). You can see the message “file rendered successfully” on window status bar located on the bottom of the window.

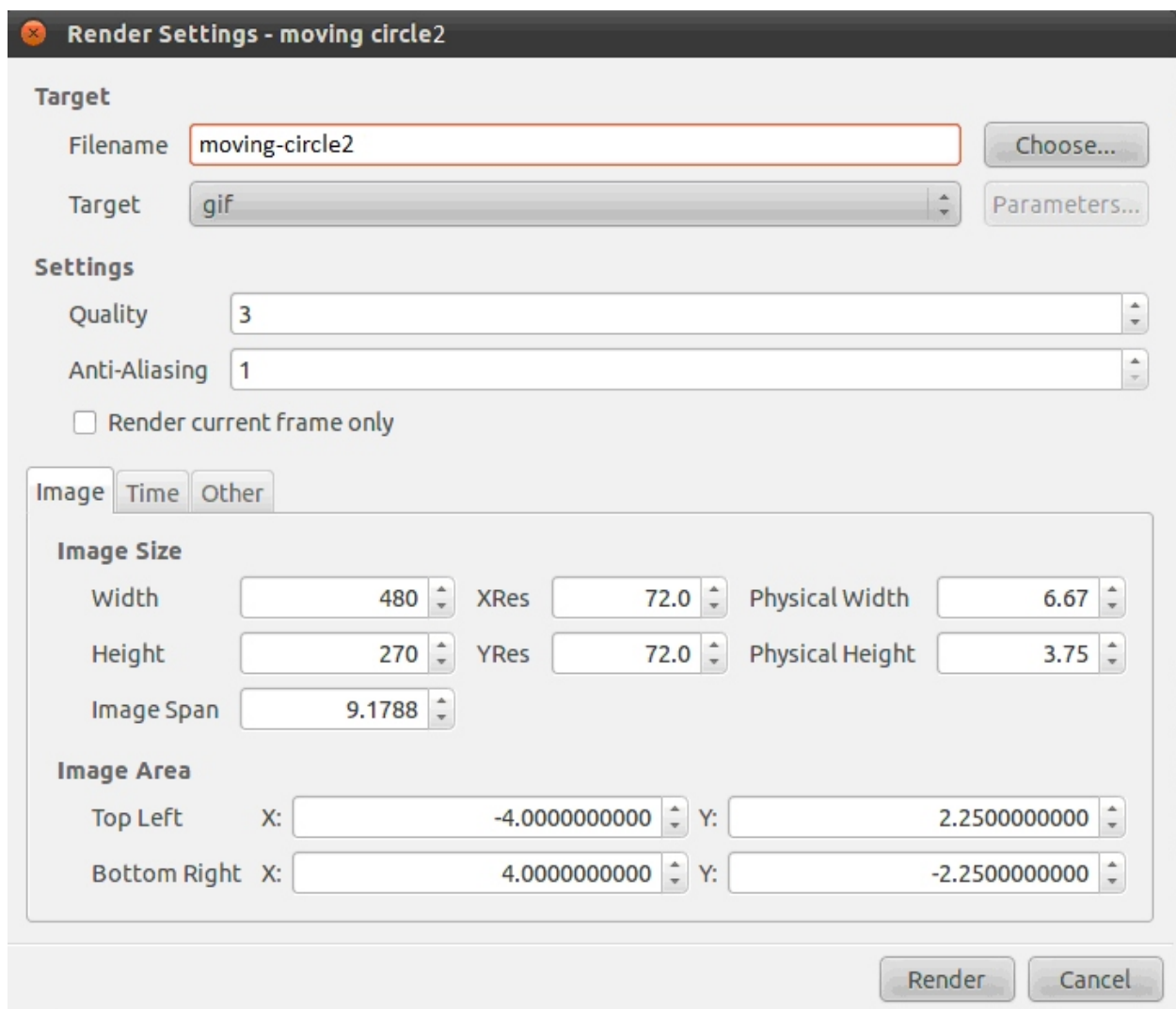


Figure 3.13(a) : Render the file

- Open moving-circle.gif file in web browser to see your animation. Figure 3.13 (b) shows the output.

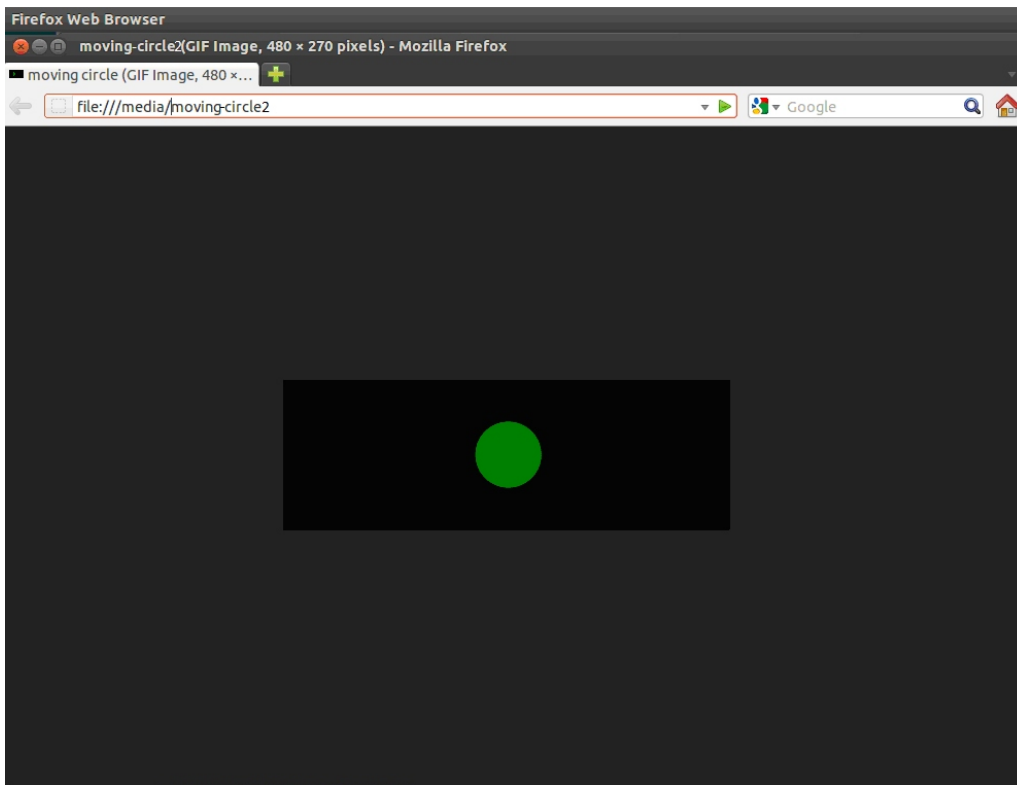


Figure 3.13(b) : Output displayed in web browser

Using Time Loop

If you want your animation to repeat again use the time loop. Let us take an example of a bouncing ball to understand Time loop. We will also see how to duplicate a keyframe which saves time in positioning the object in the animation all over again. In the example we will bounce the ball on the wall. The animation will be created twice using duplicate keyframes concept. And then use the time loop to show the bouncing continue till the end time of the animation.

- Create a new file.
- Select the Circle tool and in the tool options select only the region and the outline layer as in figure 3.14. Draw a circle on the canvas as shown in figure 3.15.

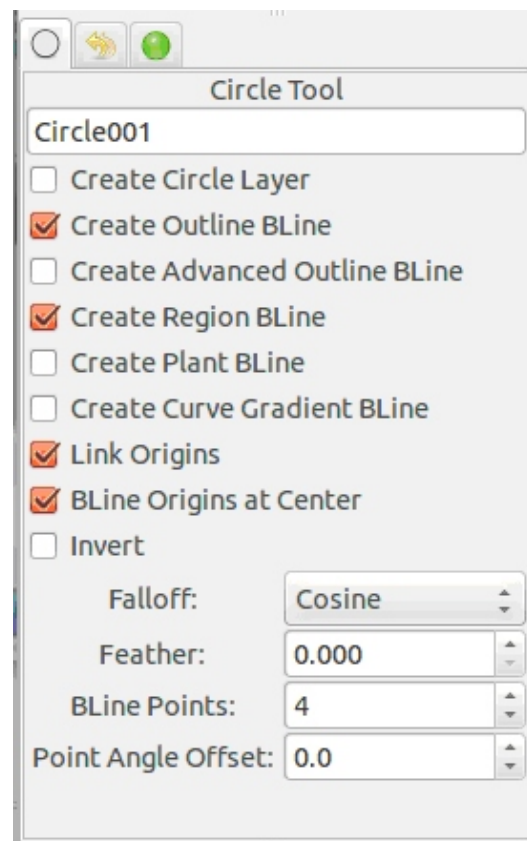


Figure 3.14: Circle tool options

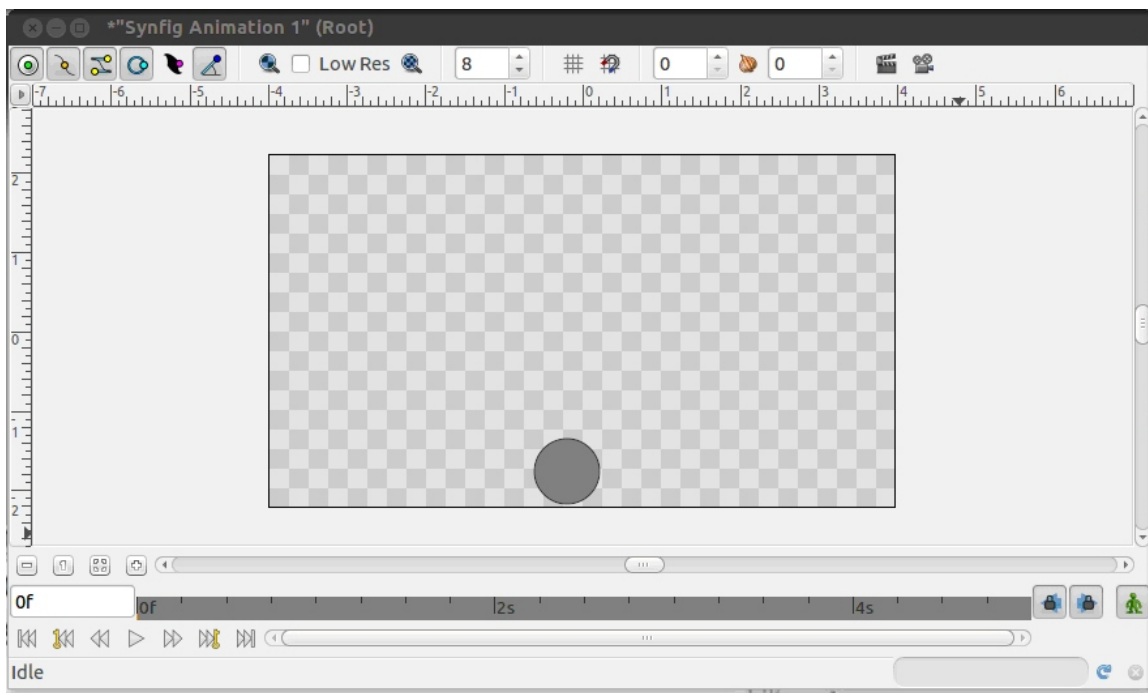



Figure 3.15 : Ball drawn using Circle tool

- Turn on the animate mode. In the timeline, record the position at “0f” by moving the ball slightly from its position. Now select the keyframe panel and add a keyframe by pressing  at the bottom of the keyframe panel. Figure 3.16 shows the keyframe added at “0f”.

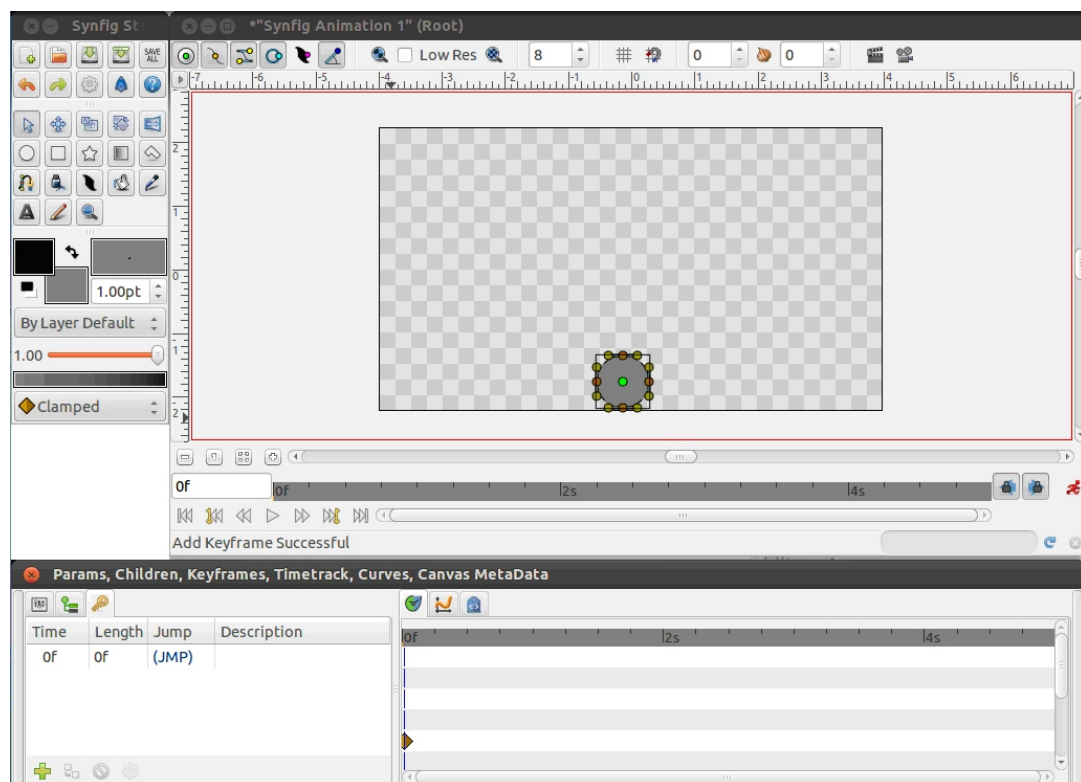


Figure 3.16 : Keyframe at 0f

- Now in the timeline come to 6f and drag the ball to a new position. Add a new keyframe at “6f” as shown in figure 3.17.

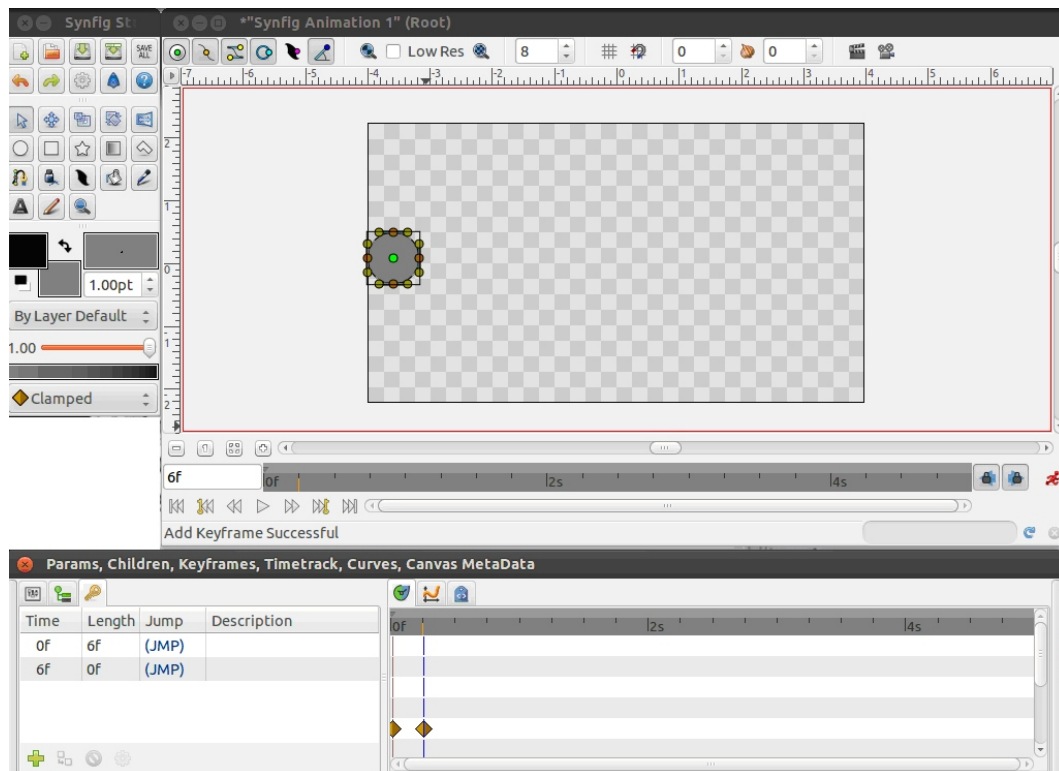


Figure 3.17 : Keyframe added at 6f

- Similarly, go to “12f”, “18f” and drag the ball to the location as shown in figure 3.18 and 3.19. Add a keyframe at both the timing location.

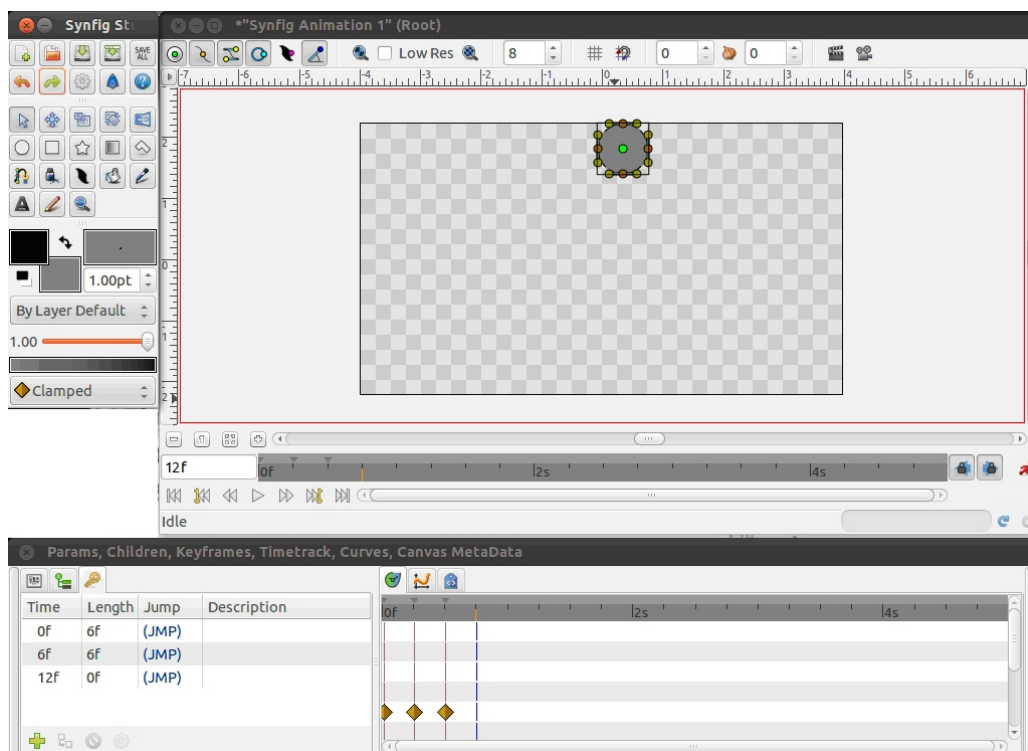


Figure 3.18 : Keyframe added at 12f

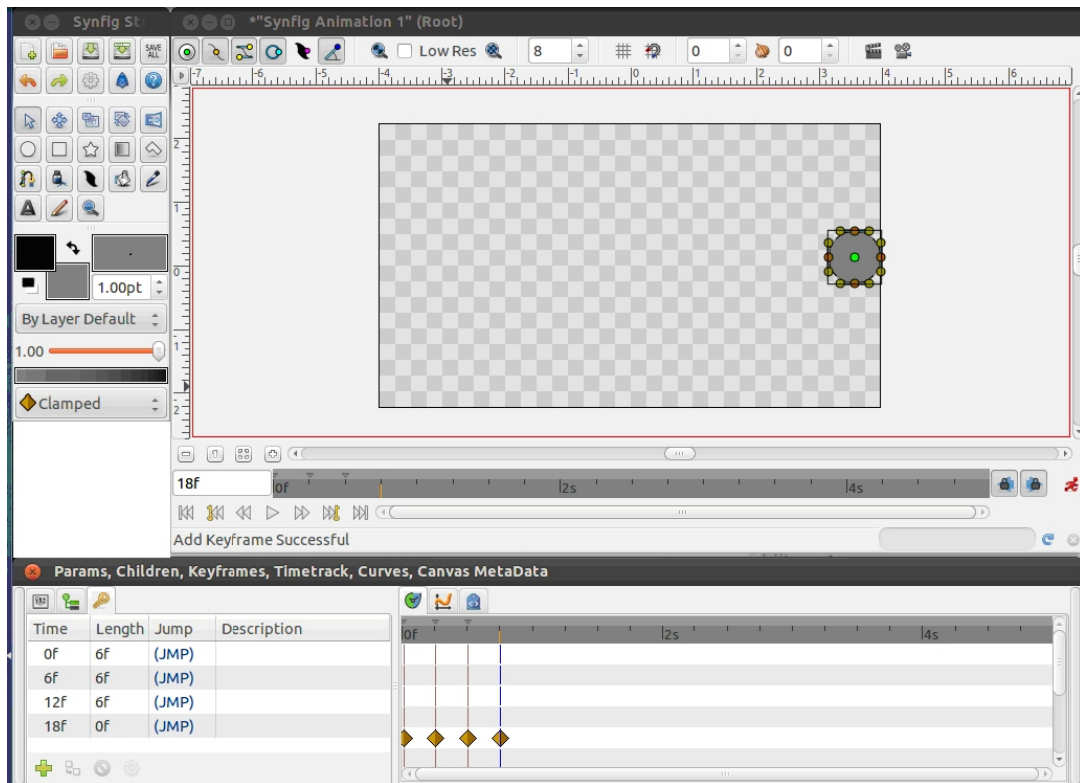


Figure 3.19 : Keyframe added at 18f

- Now come back to “1s” in the timeline, here we need the ball to come to its original position which we had at “0f”. So we need to duplicate the keyframe at “0f”. Select the “0f” keyframe from the keyframe panel and press duplicate keyframe as shown in figure 3.20. This will add a new duplicate keyframe at “1s” as shown in figure 3.21.

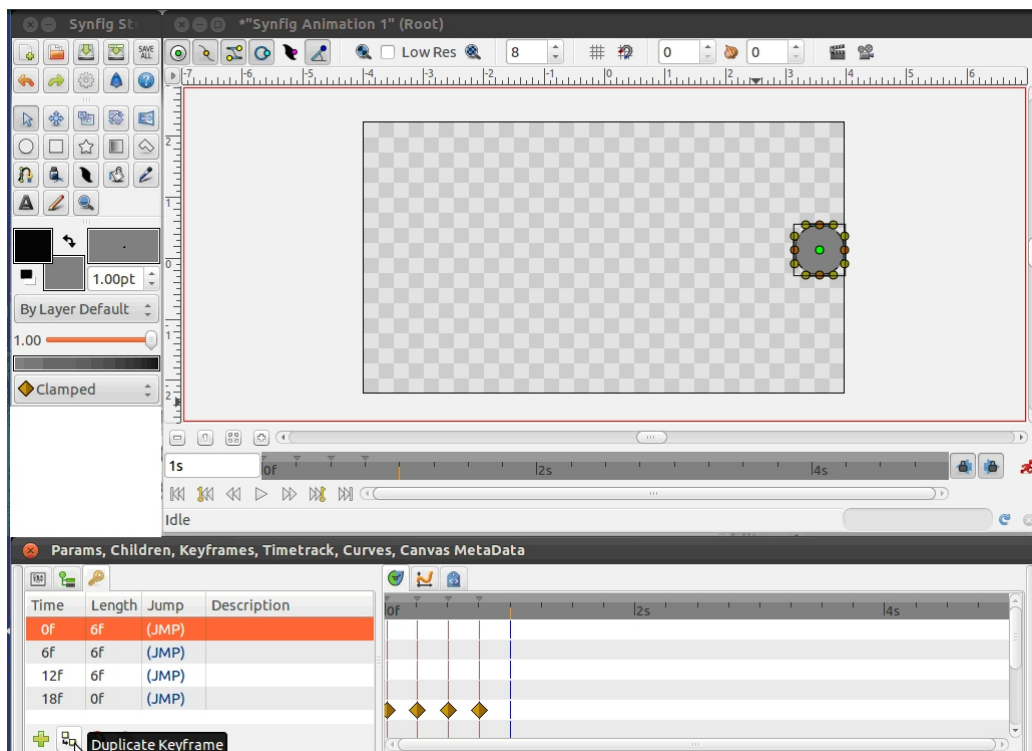


Figure 3.20 : Add a duplicate keyframe at 1s

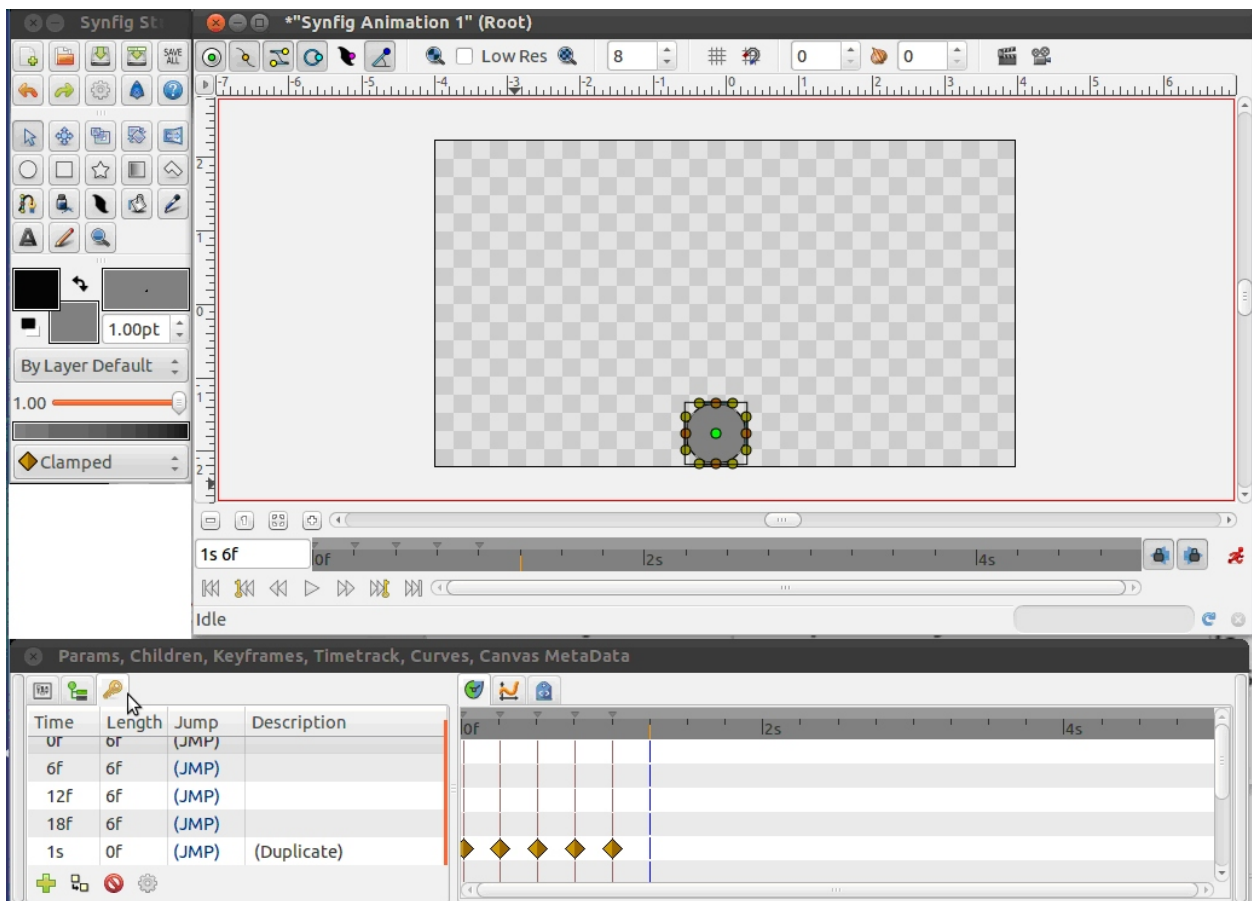


Figure 3.21 : Panel showing duplicate keyframe added

- Likewise to animate the ball twice we need to create the duplicate keyframes at 1s6f, 1s12f, 1s18f and 2s. Figure 3.22 shows the duplicate keyframes added.

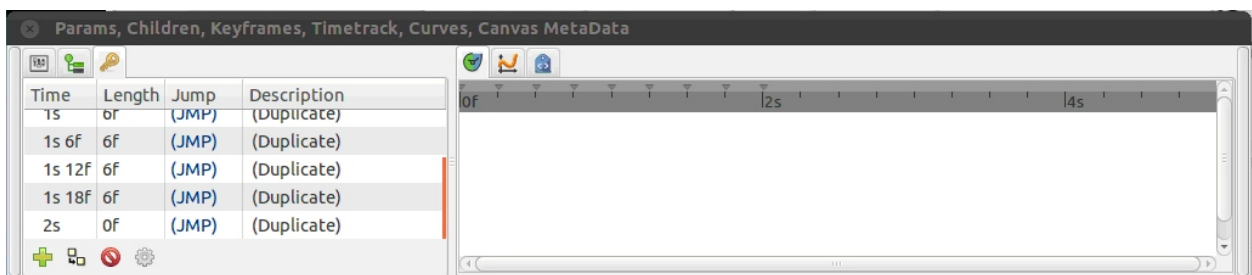


Figure 3.22 : Duplicate keyframes added

- Now preview the animation using File → Preview. You will see the ball bouncing twice till 2 seconds and then stop. We want the animation to go on till the end time. In our case the end time is 5 seconds.

We will insert a new time loop layer above the circle layer.

- Select topmost circle outline layer → Right click → Add new layer → Other Time loop. This will add a new layer as shown in figure 3.23.

Icon	Name	Z Depth
<input checked="" type="checkbox"/>	Time Loop	0.000000
<input checked="" type="checkbox"/>	Circle001 Outline	1.000000
<input checked="" type="checkbox"/>	Circle001 Region	2.000000

Figure 3.23 : Inserting time loop layer

- The time loop parameters in figure 3.24 shows the duration which denotes the frames or seconds that are looped. We can change it to 2s as our animation is playing twice till 2s.

Name	Value	Type
π Z Depth	0.000000	real
<input checked="" type="checkbox"/> Link Time	0f	time
<input checked="" type="checkbox"/> Local Time	0f	time
<input checked="" type="checkbox"/> Duration	1s	time
<input type="checkbox"/> Only For Positive Duration	<input type="checkbox"/>	bool
<input type="checkbox"/> Symmetrical	<input checked="" type="checkbox"/>	bool

Figure 3.24 : Duration parameter in the Time loop

- Preview the animation and you will see that the animation goes on playing till the end time. If you change the endtime to “10s” in the file properties window then the animation will go on playing till 10s.
- Save and render the file. Figure 3.25 shows the output on web browser.

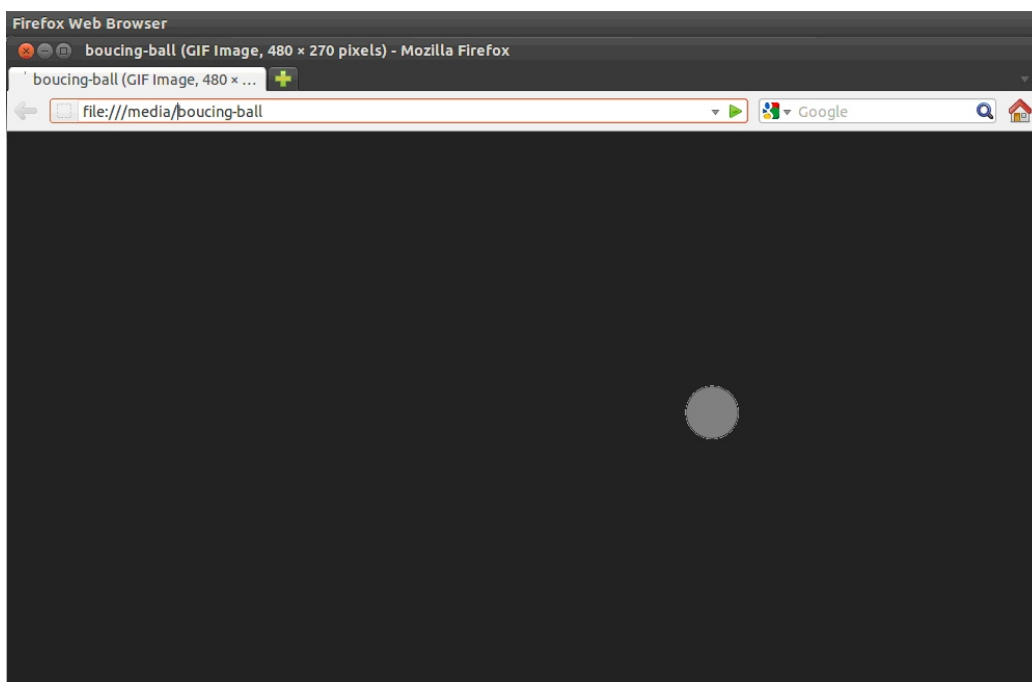


Figure 3.25 : Output displayed in web browser

Summary

In this chapter we learned how to create animation. Animate edit mode helps in recording the changes made to the object's position at different time using the timebar. When not in animate edit mode, any changes made to the object or its parameters will not have an effect on the animation. The concept of keyframe and waypoint was discussed. We also learned how to repeat an animation till the end time using the time loop layer. In the next chapter we will learn more about the concept of layers and using it to give effects to the objects.

EXERCISE

1. Define Animation and state its type.
2. Explain frame by frame and cel animation.
3. What is a keyframe?
4. What is tweening?
5. Explain animate edit mode.
6. State the purpose of timebar.
7. What is morphing?
8. What is kinematics? Give three examples.
9. **Choose the most appropriate option from those given below :**
 - (1) Which of the following terms represent the objects to be displayed over a period of time?
(a) frame (b) object
(c) keyframe (d) panel
 - (2) Each small change in the image is created and then displayed in sequence in which of the following techniques?
(a) frame by frame animation (b) cel animation
(c) tweening (d) morphing
 - (3) Which of the following timings is default setting for the End time?
(a) 2s (b) 5s
(c) 3s (d) 6s
 - (4) Which of the following terms represents a frame that defines the change to an object's properties?
(a) timeline (b) layer
(c) keyframe (d) panel
 - (5) Which of the following represents an indicator used to represent waypoint?
(a) circle (b) square
(c) rectangle (d) diamond

- (6) In animate edit mode the canvas outline colour changes to which of the following colours?
- (a) orange (b) yellow
(c) red (d) green
- (7) Which of the following terms defines the length of time in the document?
- (a) frame (b) keyframe
(c) layer (d) tweening
- (8) Which of the following is correct entry in the timeslider?
- (a) 3f 9f (b) 3s 9f
(c) 3f 9s (d) 3s 9s
- (9) Which of the following terms represent an effect wherein the image transforms into another?
- (a) morphing (b) tweening
(c) kinematics (d) keyframe
- (10) Which of the following is the default setting for frames per second?
- (a) 15 (b) 30
(c) 24 (d) 28
- (11) Which of the following terms represent the study of movement and motion of objects that have joints such as walking man or running leopard?
- (a) animation (b) kinematics
(c) tweening (d) morphing

LABORATORY EXERCISES

1. Create an animation showing the star moving from top to bottom.
2. Create an animation showing a ball bouncing on the floor. Use time loop to continue the animation till the end time.
3. Create an animation showing a circle moving from right to left and at the same time star moving from left to right on the canvas.
4. Create an animation showing three balls bouncing at different speeds.

