This tutorial will show you how to create a visual Java Bean that represents an integer value as a row of 16 LED's.

Just follow each step in turn...

Go to the Workbench
Creating a Graphical LED cluster bean
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- Add a Project using the menu item Selected -> Add -> Project

- Enter a Project name (copy the case of the example)

- Click Finish
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- Add a Package using the menu item Selected -> Add -> Package ..(use lower case)

- Click Finish
Add a new Class, sub-classing java.awt.Component...use the browse button or type it in manually as shown.

Then click Next
Use the add package button to import java.awt

Then click Finish
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- Enter your Bean description and Author details
- Click on the highlighted class and confirm your text changes
- Now double click the highlighted Class to open a new window
- Select the BeanInfo tab

- In the Features pane use the right mouse button to add features such as methods properties and events etc...
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- Add a new Property of type Object
- Leave it unbound
- Click Finish
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- in the Features pane use the right mouse button to 'add available features'
- Add the getValue() and setValue(Object)
- features
In a similar manner, create a new property called iface of type integer or ava.lang.integer…the user code will differ dependant upon conversions later

- Make it unbound

- Click Finish
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- Add the features getFace() and setFace(Integer)
- Add a new method feature, that returns void and uses one parameter
- Click Next
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- Enter the details for the parameter
- Click Next
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- Enter the description for the parameter
- Make it preferred
- Click Finish
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- Your window should look like this
- Highlight `propertyChange` in the left pane
- Click on `propertyChange` in the right pane
- The code window should open in the bottom pane
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Add the code as shown...
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- Click on the highlighted feature and confirm changes
- Any compilation errors will show on saving
Create a new unbound property called color of type java.awt.Color

Click Finish
Use Add available features to add both getColor and setColor features
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- Click on the Members tab
- Right mouse on the members pane and select Add -> Method
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- Type in `public void paint()`
- Click Next
Click the Add button
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- Add a parameter called g of type java.awt.graphics
- Click Close
- Click Finish
Your window should look like this

Enter the user code between the braces for the paint method
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int w=8;     // width
int h=8;     // height
int y=5;     // y start pos
int x=10;    // x start pos
int p=32768; // full word
int tempvar=0; // temp variable

java.lang.Integer tempvar2 = getiface();     // Get value via iface property
tempvar = tempvar2.intValue();               // Convert to int
while (p >=1)                                 // While loop to draw and colour all 16 LED's
{
    if ((tempvar / p)>=1)
    {
        tempvar=tempvar -p;
        g.setColor (Color.green);
        g.fillOval(x,y,w,h);
    }
    else
    {
        g.setColor (Color.red);
        g.fillOval(x,y,w,h);
    }
}

x=x+15;   // increment x position to draw LED's horizontally
p=p/2;

* The User code between the main braces should look like this
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Your window should look like this
Go back to the BeanInfo Tab

Select value in the left pane

Select setValue to open the code window
Modify the code as shown

Save the changes

curVal is not being used

myInt is being passed directly to Iface
Modify the Initialize() code in the Members pane .. as shown

Save the changes

This will ensure a startup size when the cluster is dropped on a form …setSize (252,18)
Let’s first test this internally…

- Change to the visual composition tab
- Click the Run button (Man running)
- Drag the window open to display all LED’s
Now let’s test this in an applet, where we can pass values to it.

Go back to the Workbench main window.

Highlight the package.

Click the ‘A’ button on the toolbar to create a new Applet.
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- Give the test applet a name
- Leave compose visually checked
- Click finish
Click on the Choose Bean jigsaw piece from the component bar
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- Use browse to find our Ledcluster bean
- Click OK
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- Drop this object in the VISIBLE bound box
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- The easiest way to test without a PLC, is to use a CLTextin bean from the S7 Bean suite
- Highlight the Textin bean
- Use right mouse to select connect - > propertyChange
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- Point the end of this line to highlight the LED’s
Create an LED cluster bean in IBM Visual Age for Java.

- Click over the LED’s and select the PropertyChangeEvent.
Double Click on the dotted green line between the 2 objects
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- Check the Pass event data check box
- Click OK
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- Click the Running man
- Enter a value in the Text field and press enter or the set button
- Confirm the correct operation..
- Green=1  Red=0
- The connection to the PLC is done in the same way, by connecting the PCE of a Variable bean to the LED cluster
Let’s try connecting to a PLC

- Insert a CP bean in the INVISIBLE area outside the bound box
- Double click on the CP bean and set the Host property to the IP address of the PLCs CP card
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- Insert a Device bean in the INVISIBLE area outside the bound box
- Double click on the Device bean and set the Slot property to the slot location for your CPU…usually slot 2 for an S7-300 system
- Insert a Variable bean in the INVISIBLE area outside the bound box

- Double click on the Variable bean and set the Address property to look at a word of data in the PLC (Marker, Input, Output or DB)
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- Insert a Timer bean in the INVISIBLE area outside the bound box
- Double click on the Timer bean and set the Cycle time property to 2000 for an update every 2 seconds
Let’s link them all together

- Connect PC (PropertyChange) of CP bean to PC of the Device bean
- Double click on the dashed green line and check the ‘pass event data’ checkbox
- Connect PC (PropertyChange) of Device bean to PC of the Variable bean
- Double click on the dashed green line and check the ‘pass event data’ checkbox
Connect ‘Action Performed’ of the Timer bean to ‘Process Get’ of the Variable bean
- Connect PC of the Variable bean to PC of the LED bean
- Pass event data
- Run the applet
- Enter the user name and password
- Either modify the PLC value or the CLTextin value and check the correct LED pattern
Congratulations!

All you need to do now is export this applet for use in a Web Authoring package.

You can also export the bean you have created for use in other people's environments.

CAUTION....!

If you export your bean as '.class' files.... NEVER re-import them back into your own environment!

All your source code will be overwritten and lost forever....
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- To add icon resources you will have to create 4 gif files
  - 16 x 16 color
  - 32 x 32 color
  - 16 x 16 mono
  - 32 x 32 mono
- Copy these files to the project resources area as shown
- Go to the BeanInfo tab
- Right click in the features pane and select ‘Generate BeanInfo Class’
You may have to close the class window and re-open it at the BeanInfo tab

You should see the four icon file fields
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- Enter the path to your icon files
- Save your changes
Go to the Visual Composition tab
Right click on the palette
Choose ‘Add beans from project’
You can create a new project if you wish
Select your bean
highlight the destination category
Click ‘Add to Category’
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- Your new icon should appear like this
- You made need to right click on the palette and choose refresh
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Your new 32 x 32 icon should appear like this

You made need to right click on the palette and choose Show Large icons
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You can freely use this in your applet now
Let’s enhance our bean so that we have a choice of either round LED’s or Rectangular LED’s

Create a new property called circular, of type Boolean

Click next
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- Enter a name and description
- Make it preferred
- Click Finish
Add the available features for getCircular() and setCircular(boolean)
- Add the available features for get and set bool
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- Modify the Paint method as shown

```java
java.lang.Integer tempvar2 = getIface(); // Get value via iface property
tempvar = tempvar2.intValue(); // Convert to int
if (getCircular()) // Test for circle then use fill Oval
    { int p=0; // Keep height as 0 for a circle
        while (p < 1)
        { if ((tempvar / p) == 1)
            { // Increment x position to draw LED's horizontally
                int = 15;
                p = p + 2;
            }
            else
            { // Else fill Rectangle
                b = 4; // Looks better if height is 4
                while (p < 1)
                { if ((tempvar / p) == 1)
                    g = color (Color green);
                    g.fillRect(x, y, w, h);
                }
            }
        }
    } else
    { // Else fill Rectangle
        int = 4;
        p = p + 2;
    }
```
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- Test your rectangular LEDs by setting the Circular property to false
Let’s publish our bean for other people to use

Go to the Workbench

Highlight our package

Choose Export from the file menu

Select jar file

Click next
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- Select our LED cluster class
Select our LED cluster icon resources
Select our LED cluster bean

Click OK

Click finish

You have now created a bean jar file for publishing

DO NOT re-import this back into your own environment

This is OK for importing as a bean module to be used by designers…there is no source code included.
Now for the programmer to create a backup of his work export in a similar way…but select the java files and resources

You can also export as a directory…or if you have versioned your work you get the option of exporting as a repository
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- Open the Class
- Under the Editions tab you can use the menu Class -> manage -> version and set versioning to automatic
Open at the package level

- Under the Editions tab you can use the menu Package -> manage -> version and set versioning to automatic
Open at the project level

Under the Editions tab you can use the menu project -> manage -> version and set versioning to automatic
You now have the ability to export the whole versioned project or packages as a repository.