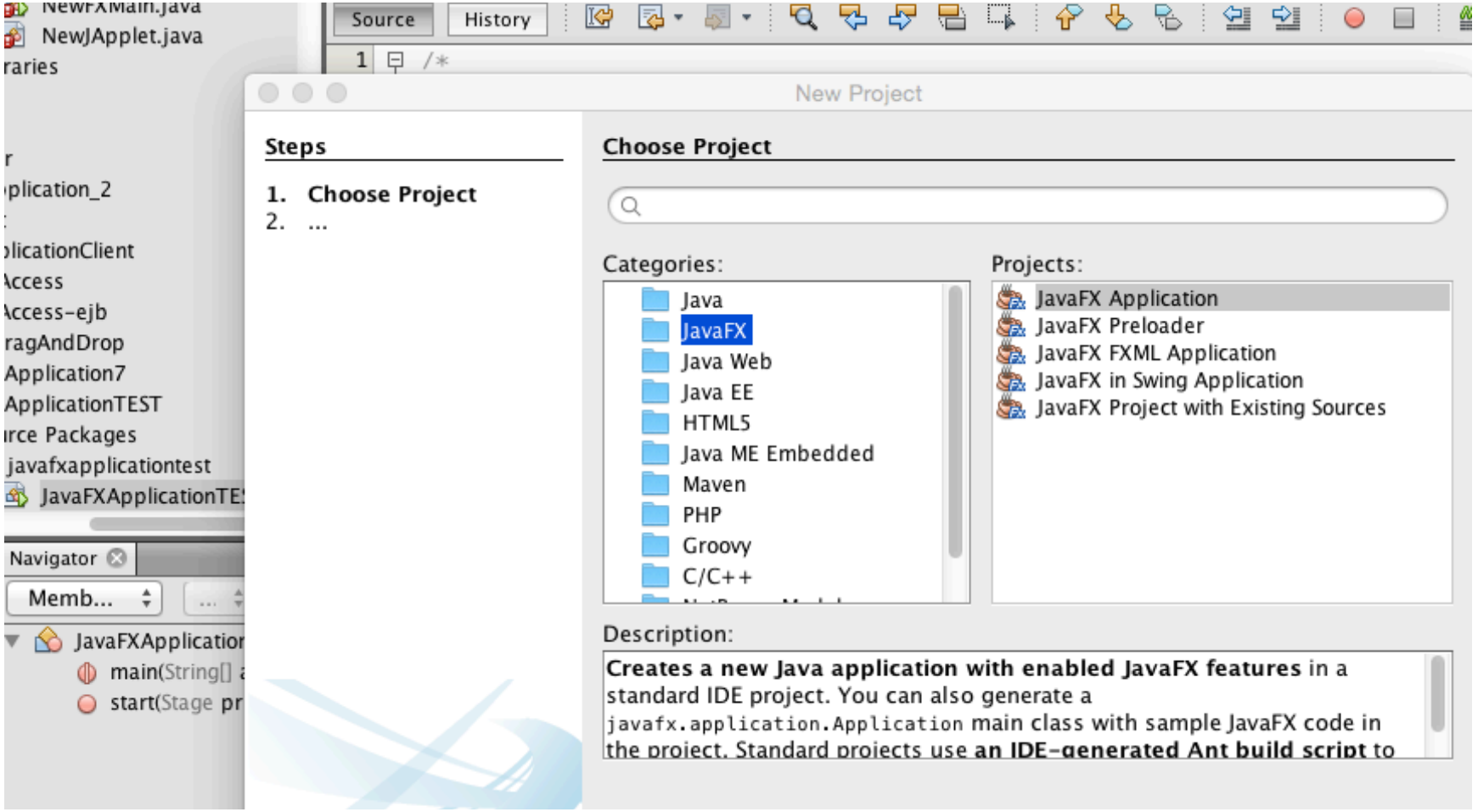
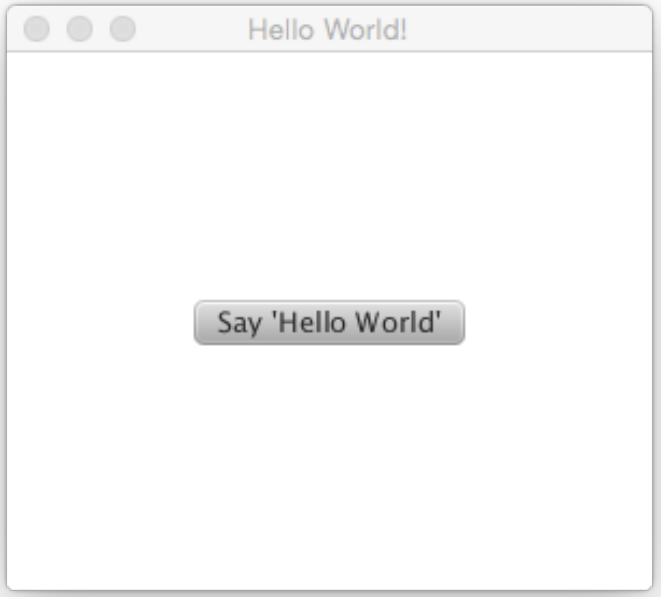
Grafica e non solo: Java FX

Creazione di una Applicazione JavaFX



Java FX




```
public class JavaFXApplicationTEST extends Application {
    @Override
    public void start(Stage primaryStage) {
        Button btn = new Button();
        btn.setText("Say 'Hello World'");
        btn.setOnAction(new EventHandler<ActionEvent>() {
            @Override
            public void handle(ActionEvent event) {
                System.out.println("Hello World!");
            }
        });
        StackPane root = new StackPane();
        root.getChildren().add(btn);
        Scene scene = new Scene(root, 300, 250);

        primaryStage.setTitle("Hello World!");
        primaryStage.setScene(scene);
        primaryStage.show();
    }
    public static void main(String[] args) {
        launch(args);
    }
```

Java FX

```
public class JavaFXApplicationTEST extends Application {
    @Override
    public void start(Stage primaryStage) {
        Button btn = new Button();
        btn.setText("Say 'Hello World'");
        btn.setOnAction(new EventHandler<ActionEvent>() {
            @Override
            public void handle(ActionEvent event) {
                System.out.println("Hello World!");
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        });
        StackPane root = new StackPane();
        root.getChildren().add(btn);
        Scene scene = new Scene(root, 300, 250);
        primaryStage.setTitle("Hello World!");
        primaryStage.setScene(scene);
        primaryStage.show();
    }
    public static void main(String[] args) {
        launch(args);
    }
}
```
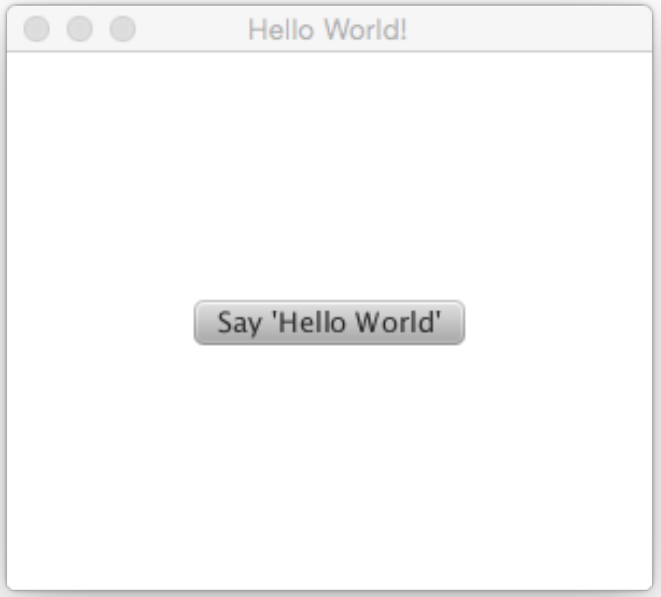
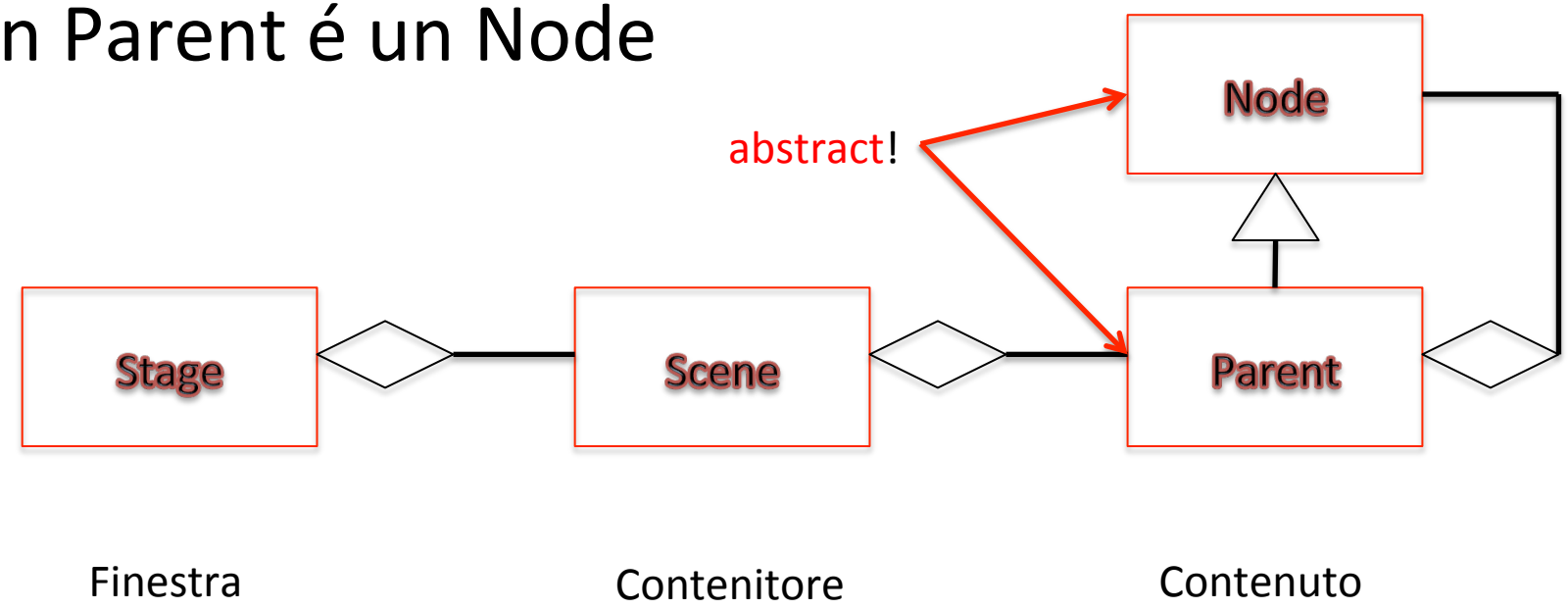



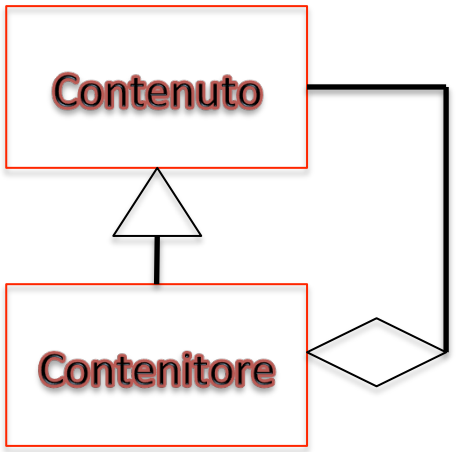
Stage/Scene/Parent/Node

Finestra == Stage

- Uno Stage contiene una Scene
- Una Scene ha un Parent
- Un Parent é un Node



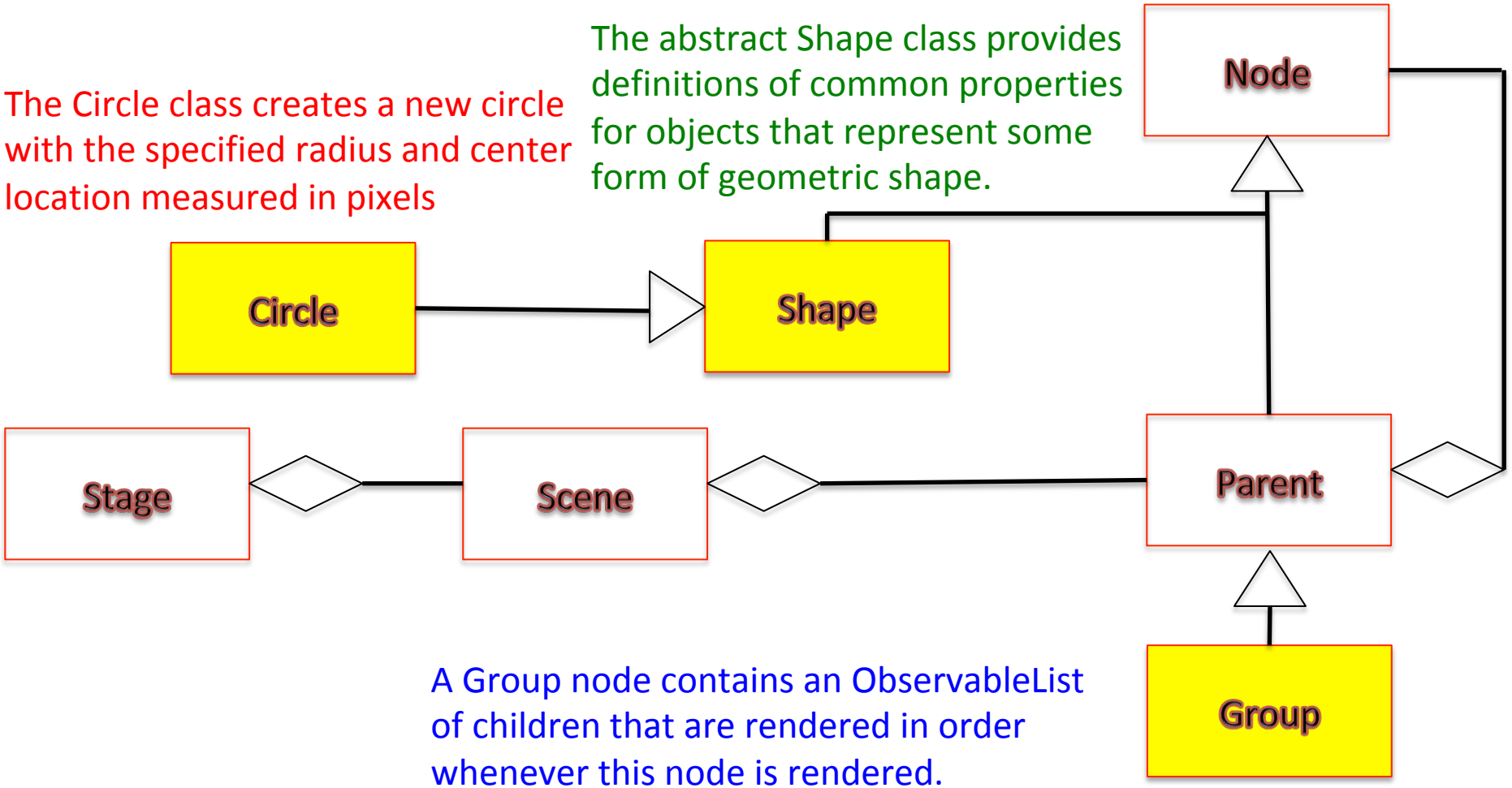
Combinazione speciale di is-a e has-a



Group – Shape - Circle

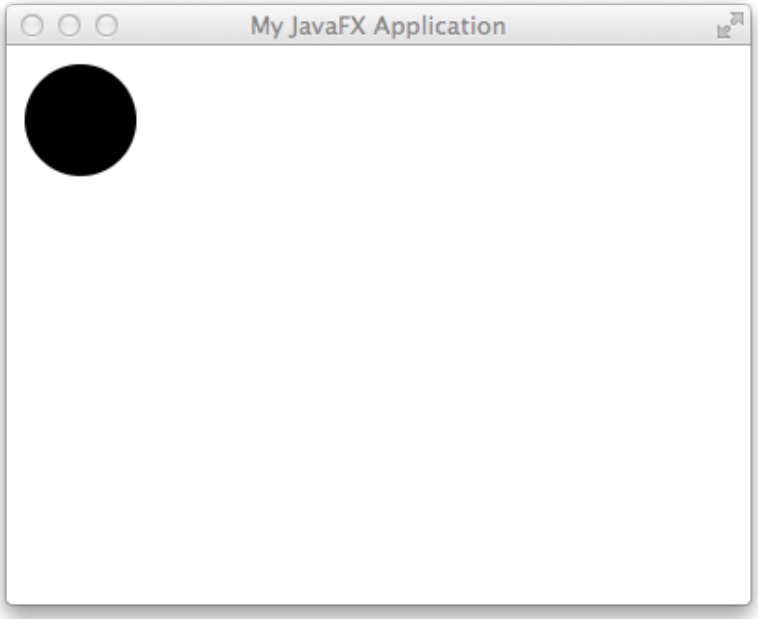
The Circle class creates a new circle with the specified radius and center location measured in pixels

The abstract Shape class provides definitions of common properties for objects that represent some form of geometric shape.



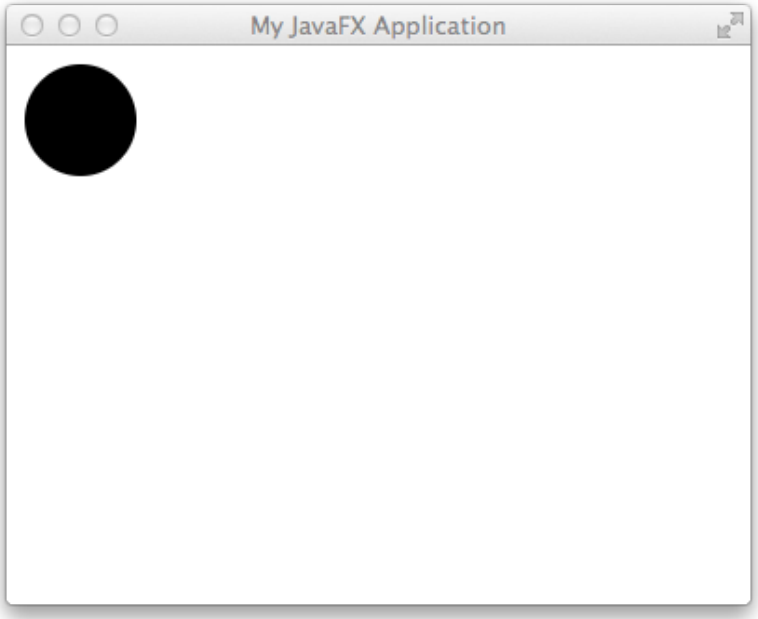
A Group node contains an ObservableList of children that are rendered in order whenever this node is rendered.

Applicazione minima




```
package it.unitn.disi.javafxapplication;
import javafx.application.Application;
import javafx.scene.Group;
import javafx.scene.Scene;
import javafx.scene.shape.Circle;
import javafx.stage.Stage;
public class MinimalApp extends Application {
     public void start(Stage stage) {
         Node circ = new Circle(40, 40, 30);
         Parent root = new Group(circ);
         Scene scene = new Scene(root, 400, 300);
         stage.setTitle("My JavaFX Application");
         stage.setScene(scene);
         stage.show();
     }
       public static void main(String[] args) {
         Application.launch(args);
  } }
```

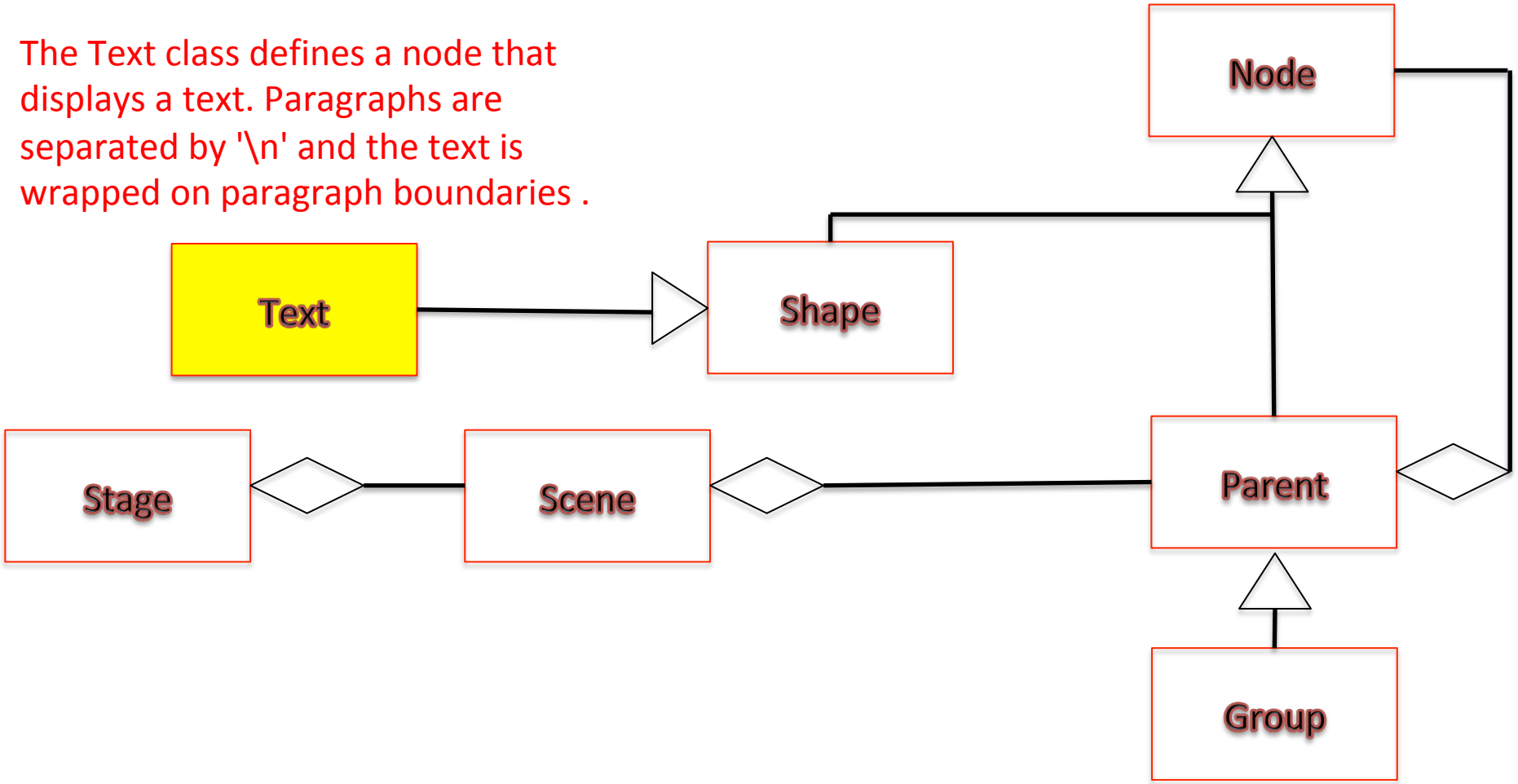
Applicazione minima




```
package it.unitn.disi.javafxapplication;
import javafx.application.Application;
import javafx.scene.Group;
import javafx.scene.Scene;
import javafx.scene.shape.Circle;
import javafx.stage.Stage;
public class MinimalApp extends Application {
     public void start(Stage stage) {
         Circle circ = new Circle(40, 40, 30);
         Group root = new Group(circ);
         Scene scene = new Scene(root, 400, 300);
         stage.setTitle("My JavaFX Application");
         stage.setScene(scene);
         stage.show();
     }
       public static void main(String[] args) {
         Application.launch(args);
  } }
```

Group – Shape - Circle

The Text class defines a node that displays a text. Paragraphs are separated by '\n' and the text is wrapped on paragraph boundaries .



Shape hierarchy

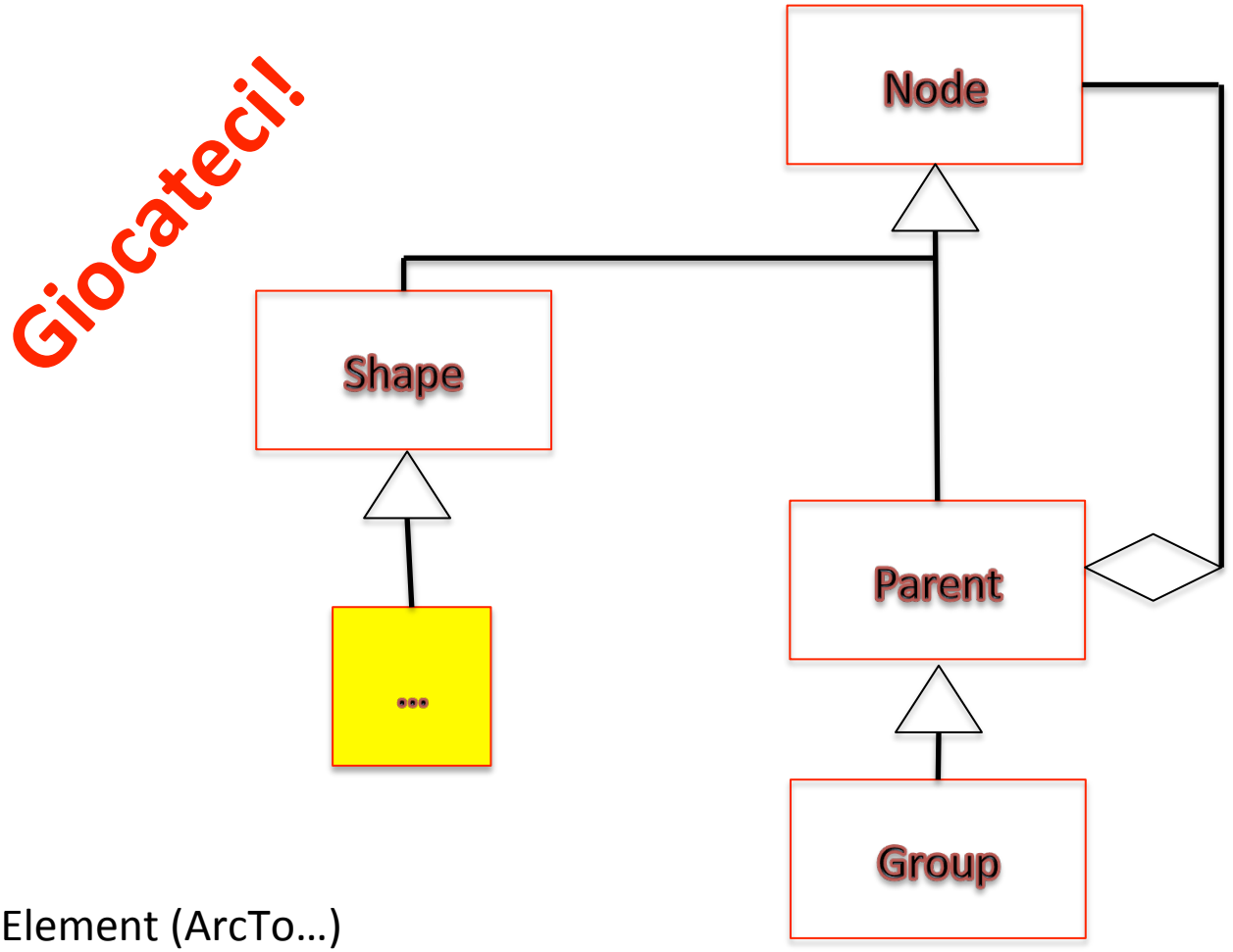
Shape

- Line
- Polyline
- Polygon
- Rectangle

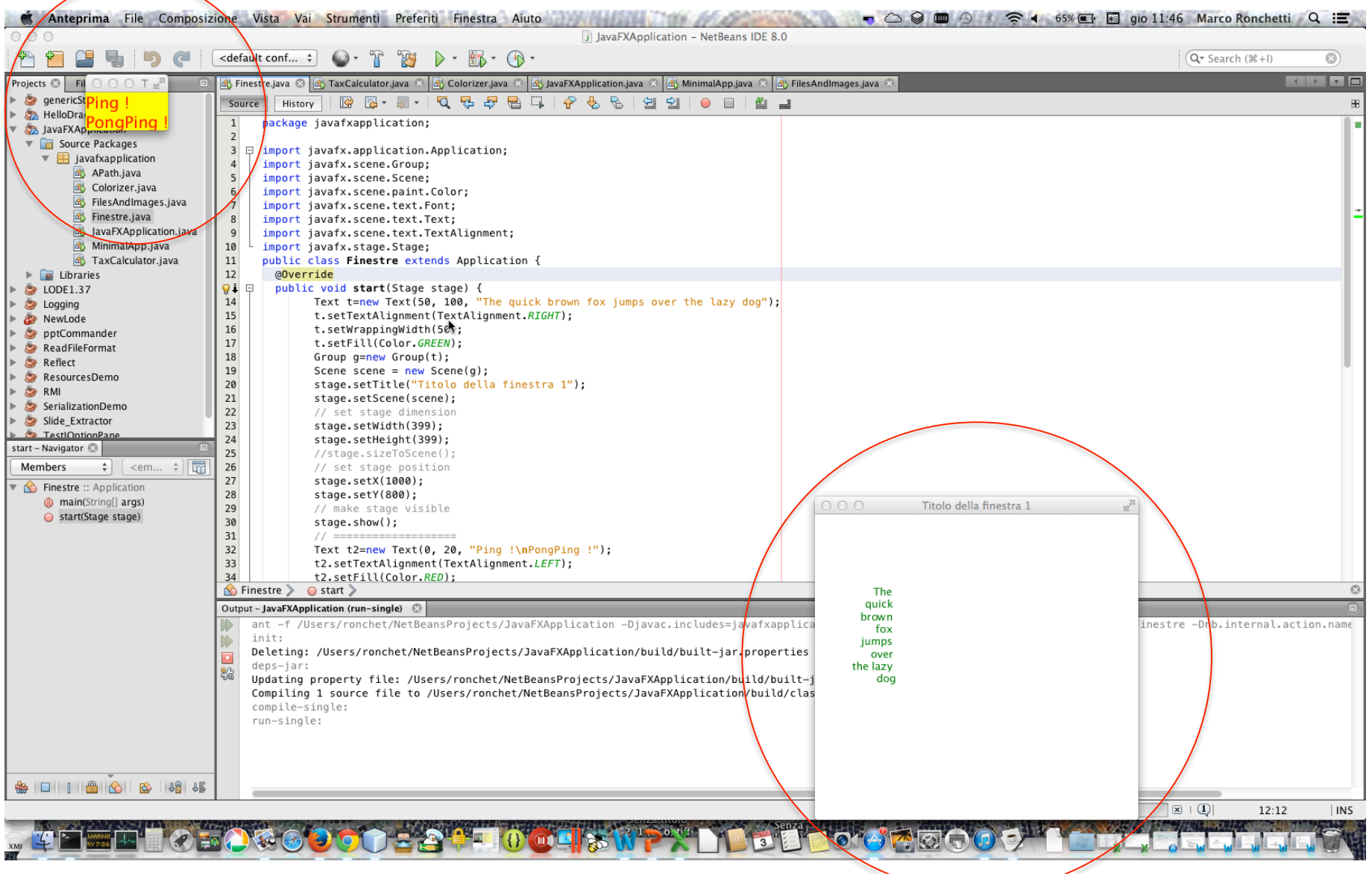
- Arc
- Circle
- Ellipse
- QuadCurve
- CubicCurve

- Text

- SVGPath
- Path composto di PathElement (ArcTo…)

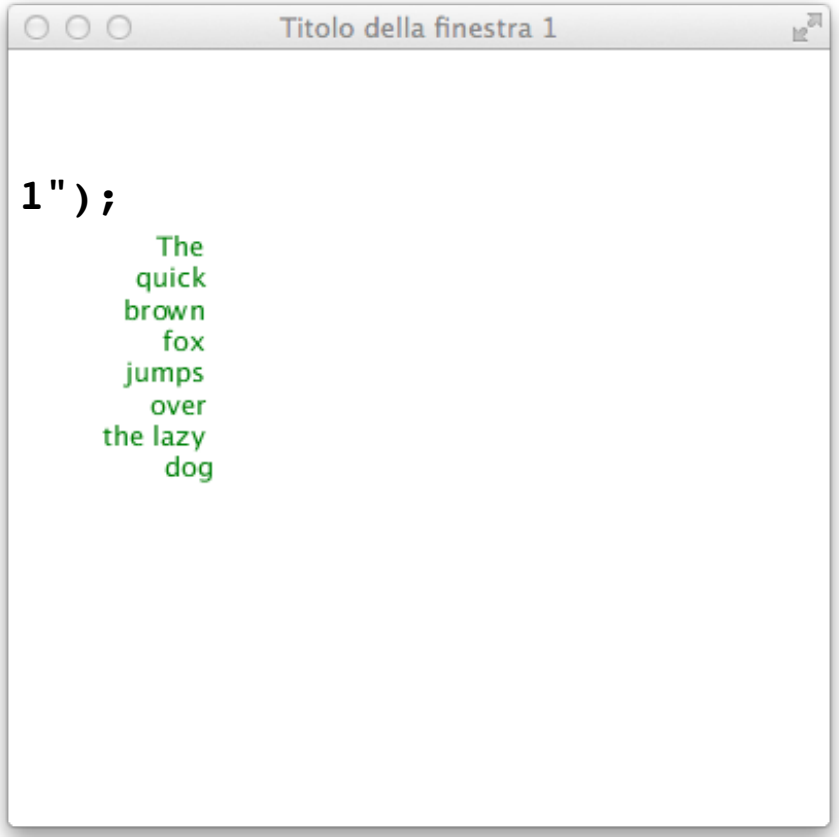


Esempio: Finestre multiple



Finestre multiple: Prima finestra

```
public class Finestre extends Application {
public void start(Stage stage) {
     Text t=new Text(50, 100, "The quick brown fox jumps over
        the lazy dog");
     t.setTextAlignment(TextAlignment.RIGHT);
     t.setWrappingWidth(50);
     t.setFill(Paint.valueOf("GREEN"));
     Group g=new Group(t);
     Scene scene = new Scene(g);
     stage.setTitle("Titolo della finestra 1");
     stage.setScene(scene);
     // set stage dimension
     stage.setWidth(399);
     stage.setHeight(399);
    // set stage position
     stage.setX(1000);
     stage.setY(800);
     // make stage visible
     stage.show();
```



Finestre multiple: Seconda finestra

```
        Text t2=new Text(0, 20, "Ping !\nPongPing !");
         t2.setTextAlignment(TextAlignment.LEFT);
         t2.setFill(Paint.valueOf("RED"));
        t2.setFont(new Font(20));
         Group g2=new Group(t2);
         Scene scene2 = new Scene(g2);
         scene2.setFill(Paint.valueOf("YELLOW"));
         Stage stage2=new Stage();
         stage2.setTitle("Titolo della finestra 2");
         stage2.setScene(scene2);
         stage2.setX(100);
         stage2.setY(80);
         stage2.sizeToScene();
         stage2.show();
}
public static void main(String[] args) {
        launch(args);
} }
```

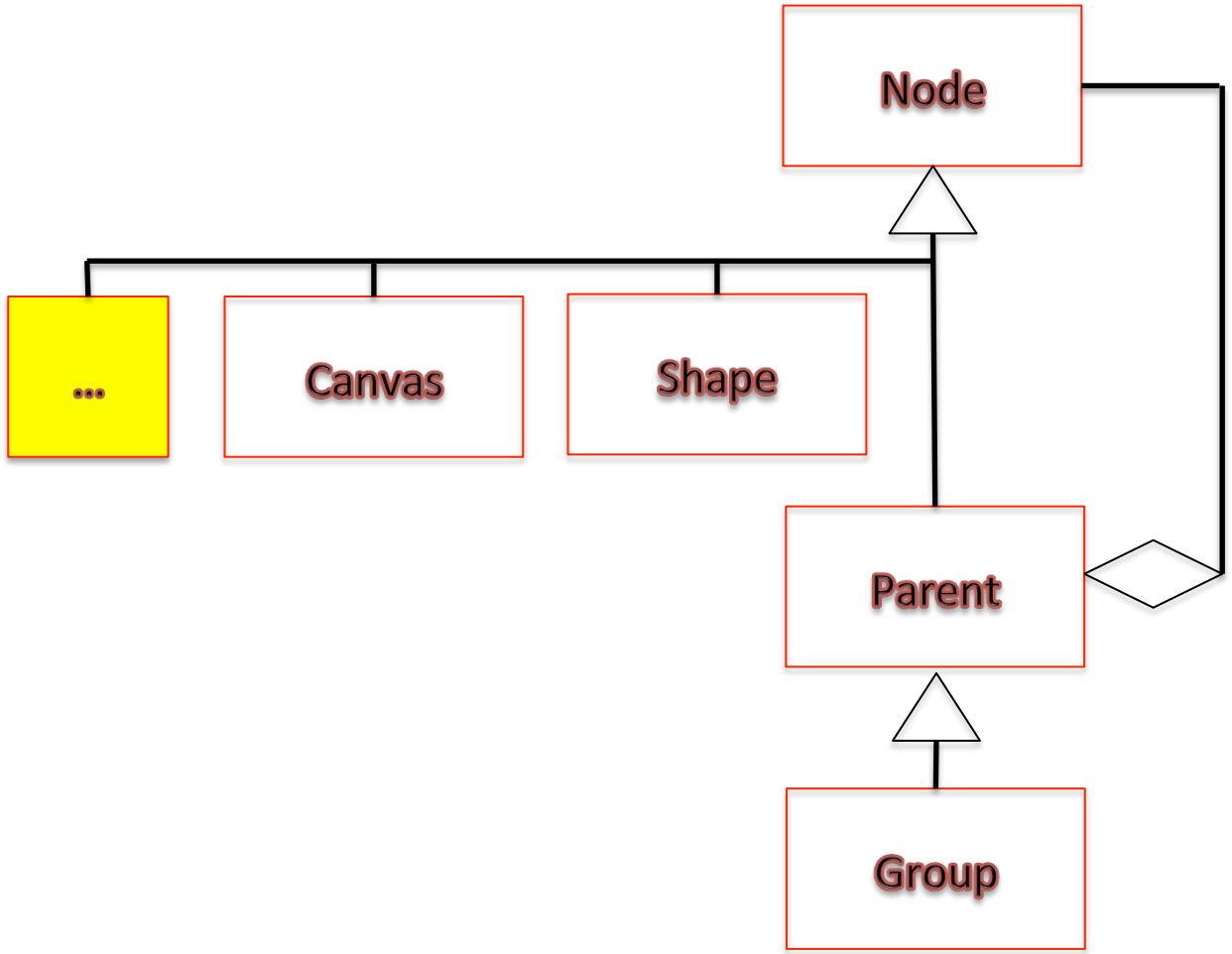
Altri esempi e approfondimenti

- Da guardare in autonomia a casa!

Node hierarchy

Node

- Parent
- Shape
- Canvas



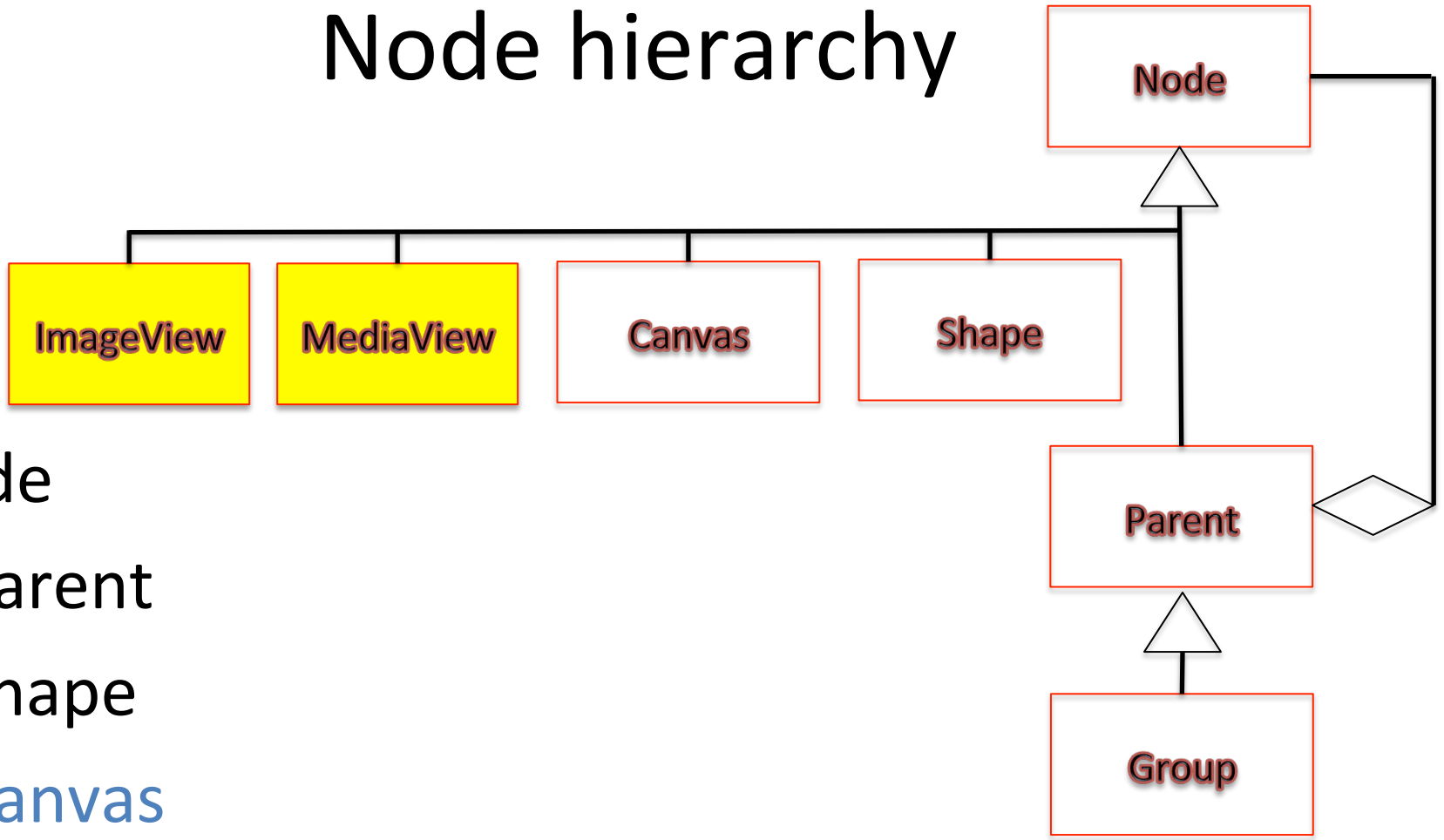
Canvas

Una "tela del pittore" con un metodo per ottenere il suo GraphicContext che ha varie primitive per disegnarci sopra:

- fillArc()
- fillRect()
- drawImage()
- …

http://docs.oracle.com/javafx/2/canvas/jfxpub-canvas.htm

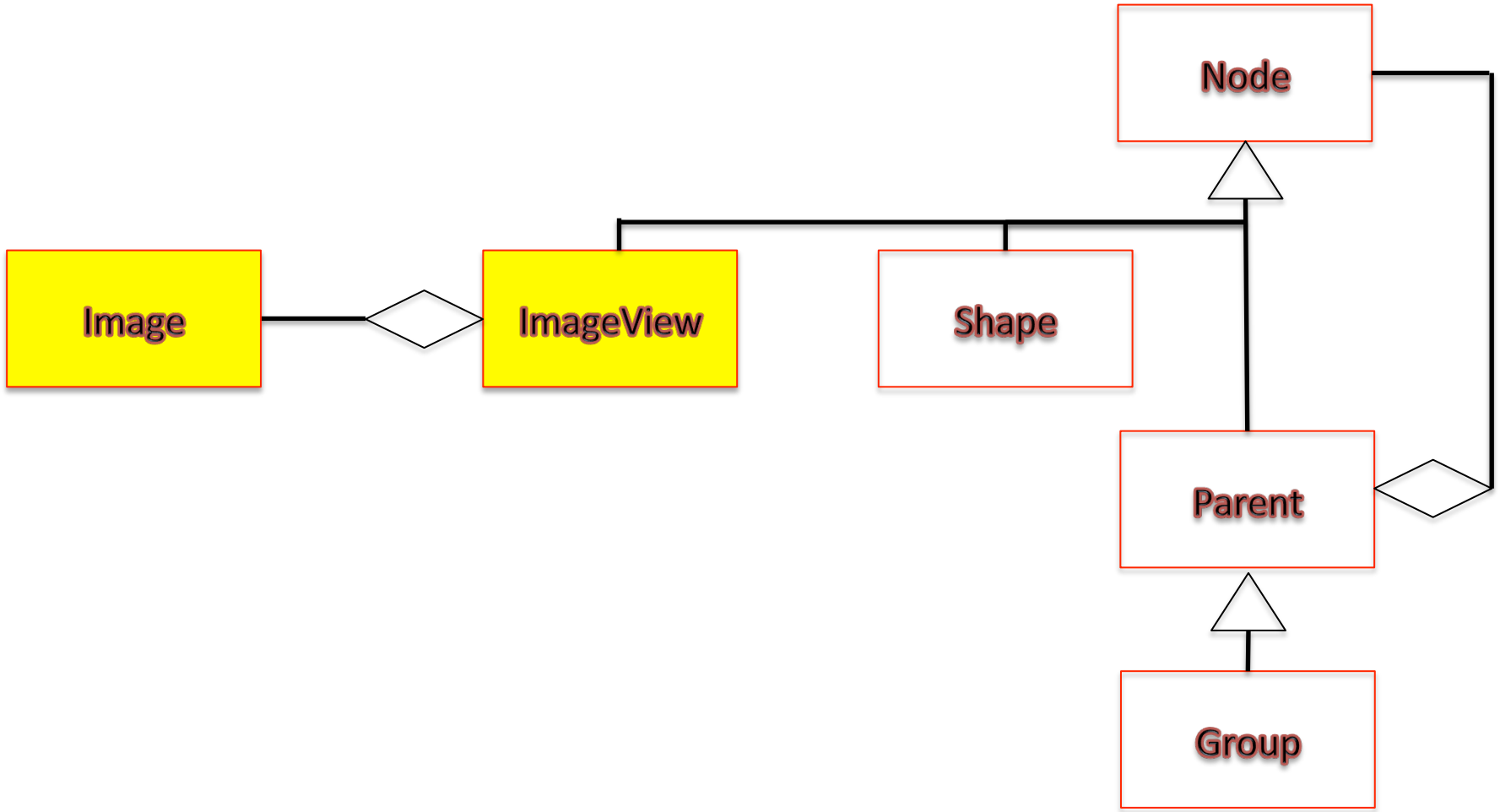
Node hierarchy



Node

- Parent
- Shape
- Canvas
- ImageView
- MediaView

ImageView - Image



Parent hierarchy (partial)

Parent

- Control
  - superclasse di vari widget,

    tra cui FileChooser
- …

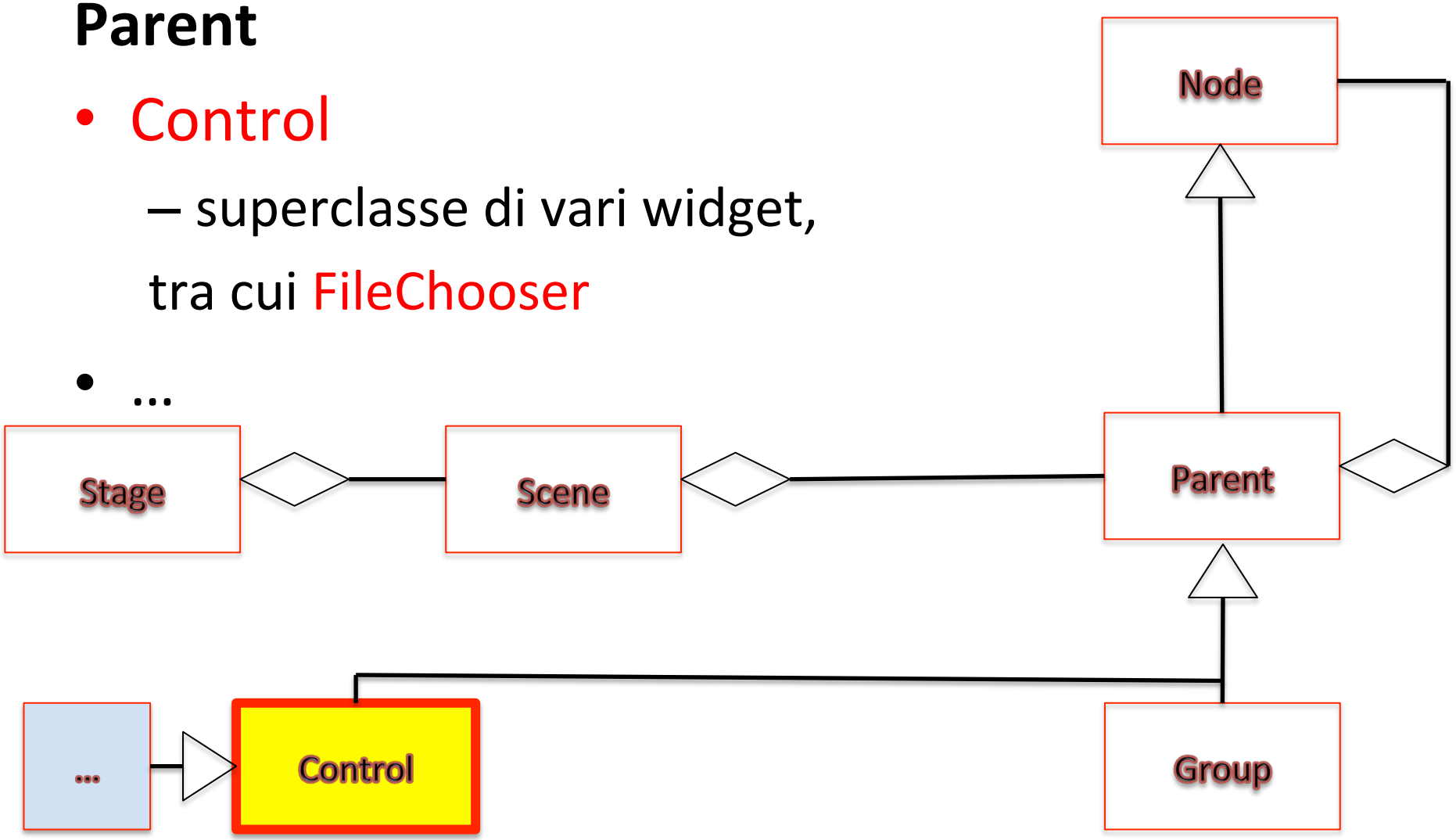
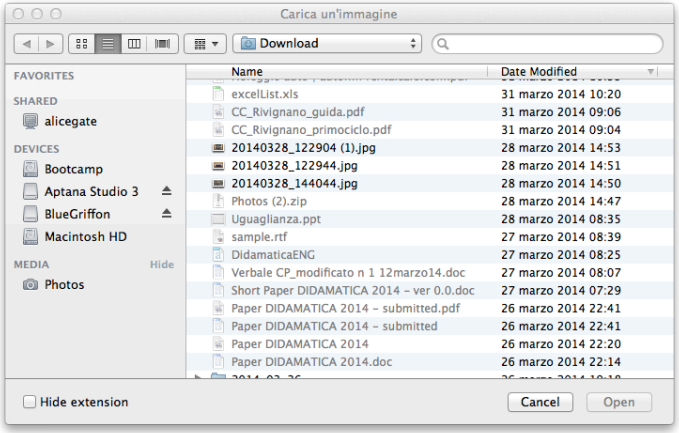


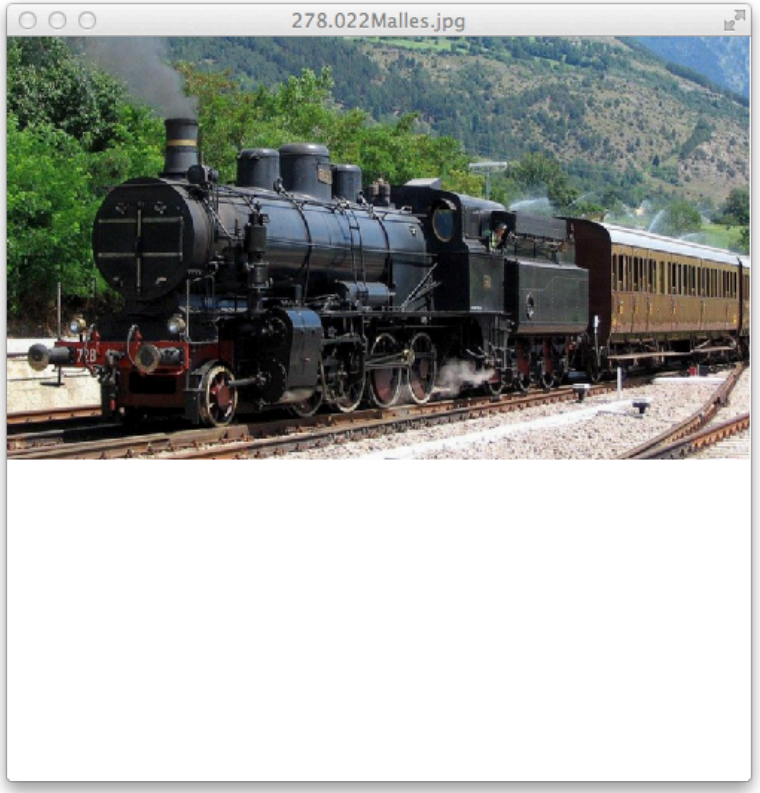
Image and File



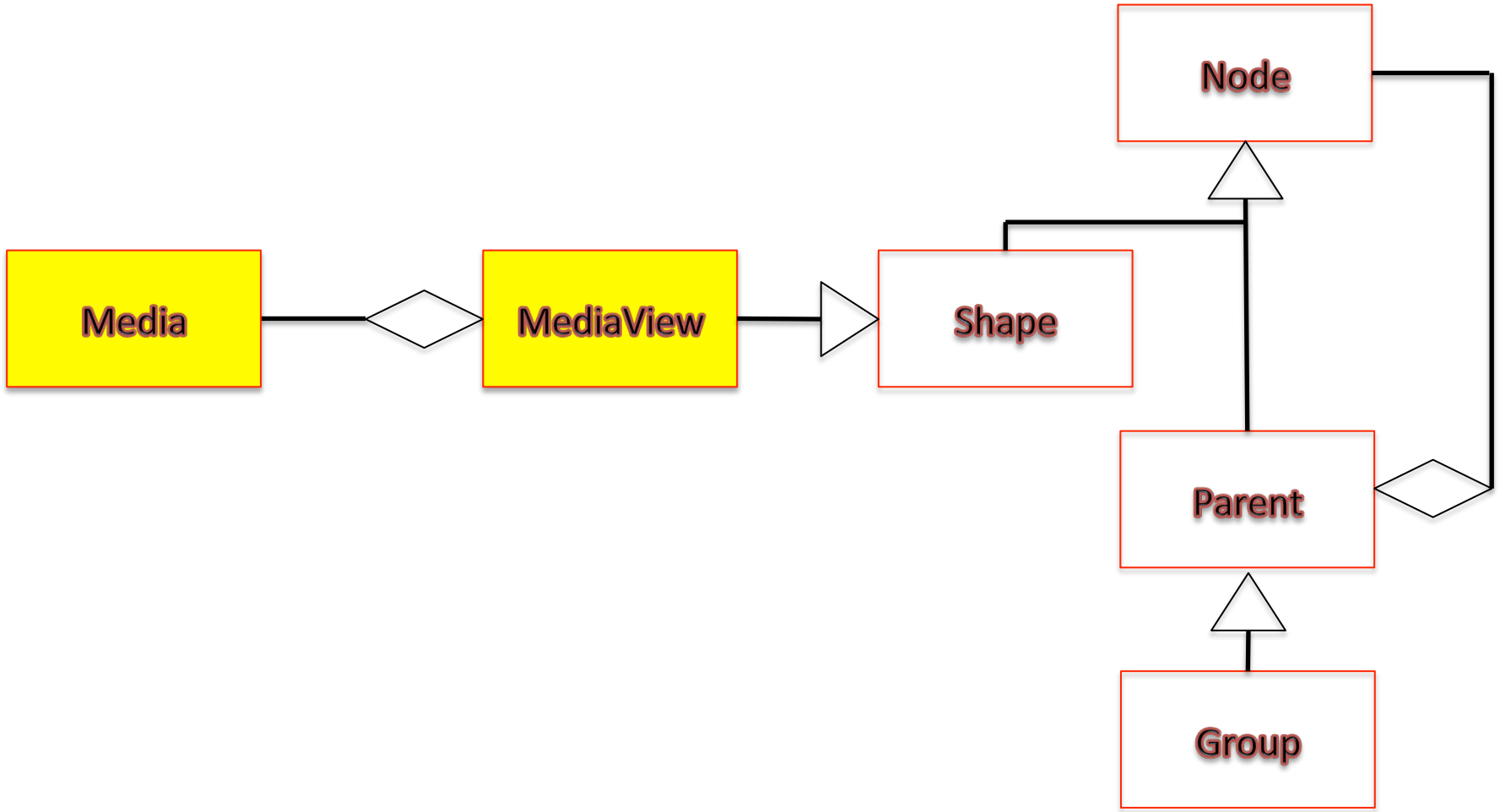

```
public class FilesAndImages extends Application {
    public void start(Stage stage) {
        FileChooser fileChooser = new FileChooser();
         fileChooser.setTitle("Carica un'immagine");
        fileChooser.getExtensionFilters().addAll(
                new FileChooser.ExtensionFilter("JPG", "*.jpg"),
                new FileChooser.ExtensionFilter("PNG", "*.png")
         );
        String url = System.getProperty("user.home");
         File f=new File(url);
        fileChooser.setInitialDirectory(f); // bugged on MacOsX
        File file = fileChooser.showOpenDialog(stage);
         if (file == null) {
             System.out.println("No file chosen");
             System.exit(1);
         }
```

Image and File

```
        Image image = new Image("file://" +
                    file.getAbsolutePath(), 500, 500, true, true);
        ImageView iw = new ImageView(image);
        Group root = new Group(iw);
        Scene scene = new Scene(root, 500,500);
        stage.setTitle(file.getName());
        stage.setScene(scene);
        stage.sizeToScene();
        stage.show();
    }

    public static void main(String[] args) {
        Application.launch(args);
    }
}
```

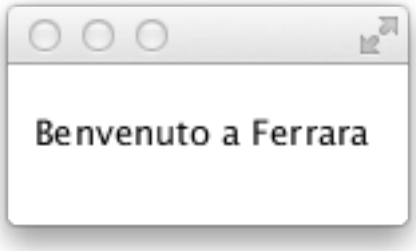


MediaView - Media



MediaView

```
public class Sounds extends Application{
    public void start(Stage stage) {
        Media media = new Media("http://www.ferraraterraeacqua.it/
it/audioguide/audioguide-di-ferrara-citta-del-rinascimento/
01_benvenuto-a-ferrara.mp3");
        MediaPlayer mediaPlayer = new MediaPlayer(media);
        mediaPlayer.setAutoPlay(true);
        // create mediaView and add media player to the viewer
        MediaView mediaView = new MediaView(mediaPlayer);
        Group root = new Group(mediaView);
        root.getChildren().add(
               new Text(10, 30,"Benvenuto a Ferrara"));
        Scene scene = new Scene(root, 150, 60);
        stage.setScene(scene);
        stage.sizeToScene();
        stage.show();
    }
    public static void main(String[] args) {
        Application.launch(args);
    }
}
```



http://docs.oracle.com/javafx/2/media/overview.htm

Uno sguardo ai parent

Parent hierarchy

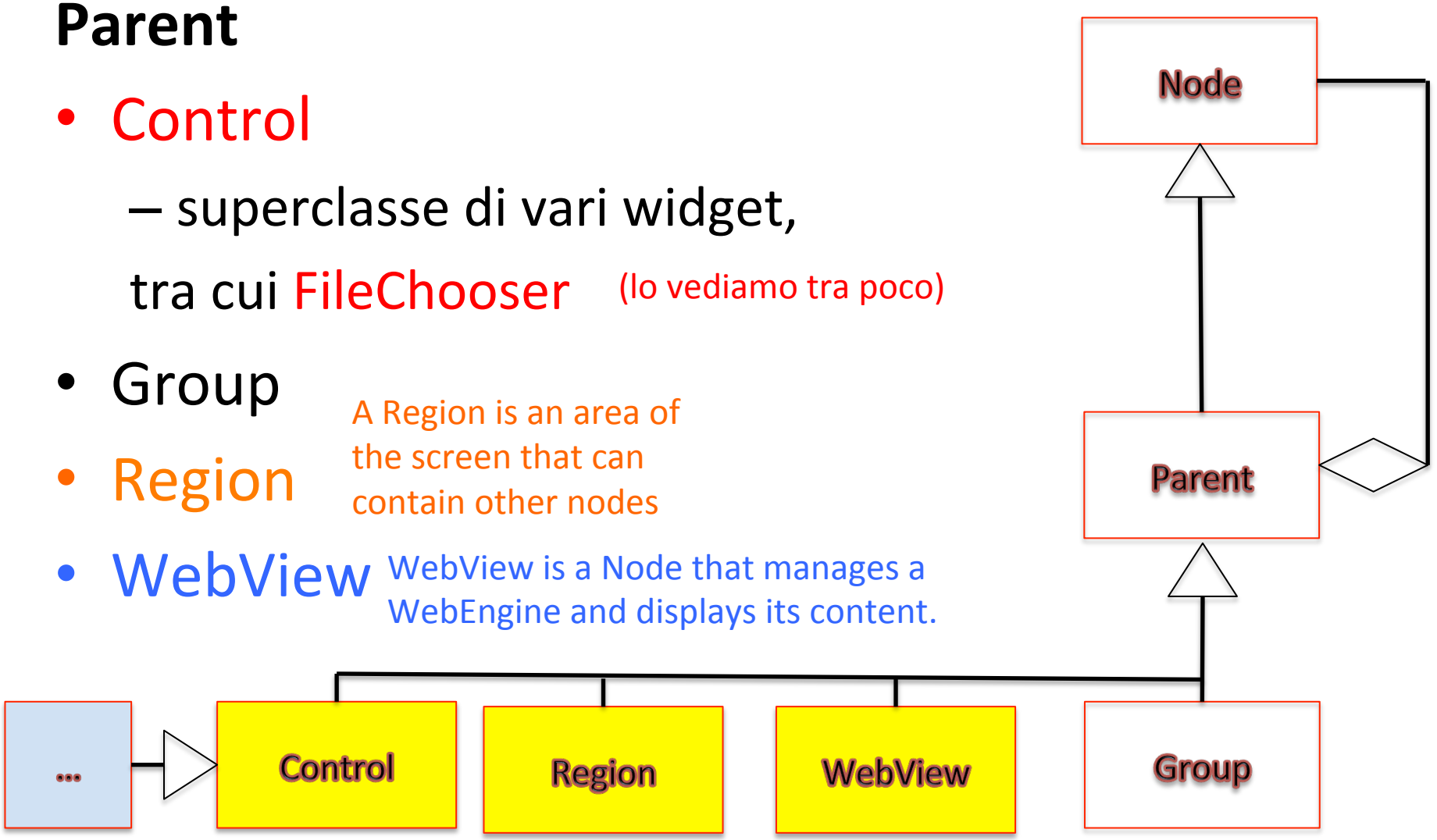
Parent

- Control
  - superclasse di vari widget,

    tra cui FileChooser (lo vediamo tra poco)
- Group
- Region
- WebView

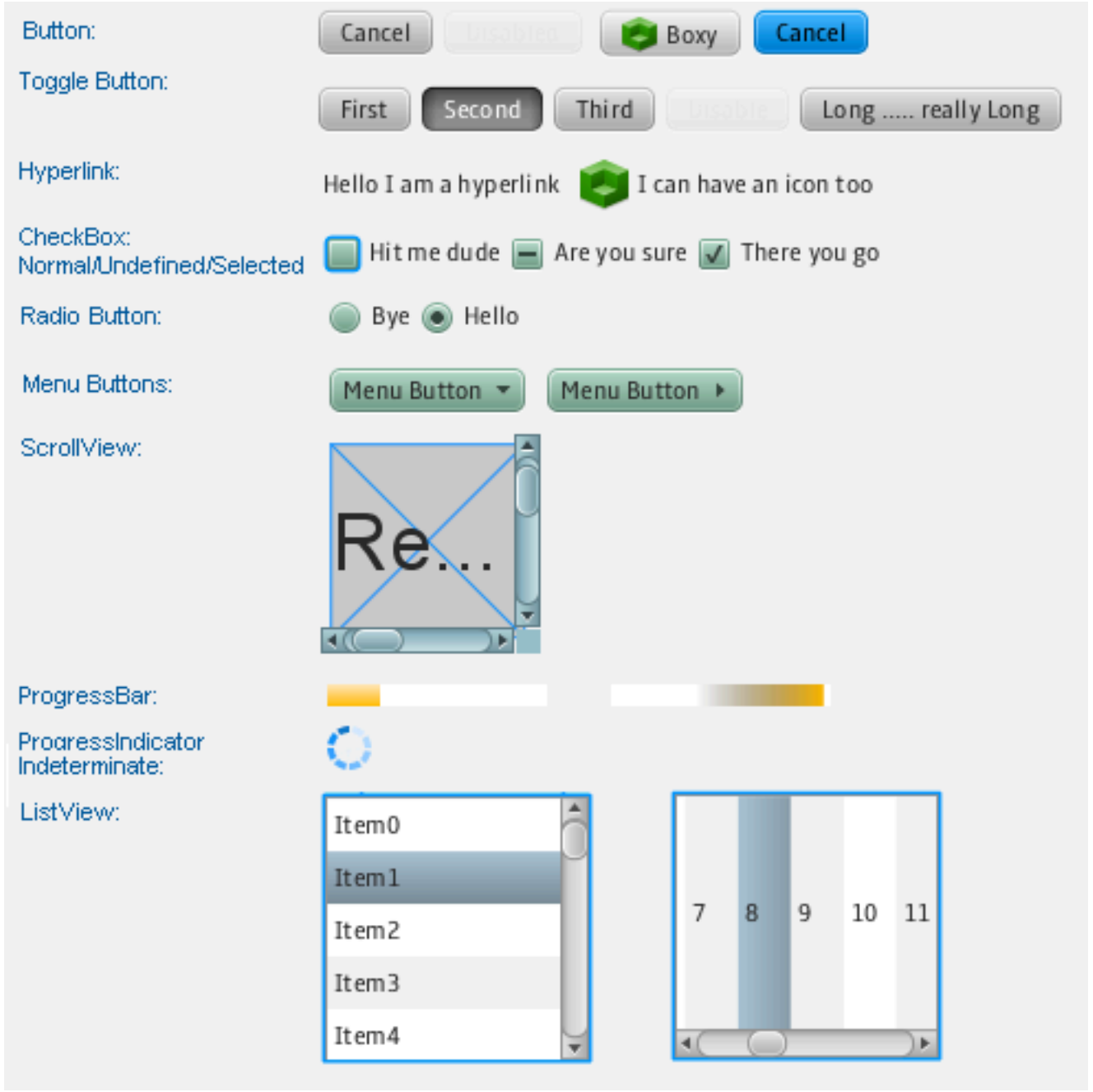
A Region is an area of the screen that can contain other nodes

WebView is a Node that manages a WebEngine and displays its content.



JavaFX UI Controls

Controls

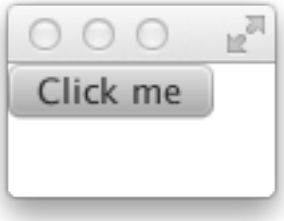

Button:
Cancel
Boxy
Cancel
Toggle Button:
First
Second
Third
Long ..... really Long
Hyperlink:
Hello I am a hyperlink
I can have an icon too
CheckBox:
Normal/Undefined/Selected
Hit me dude
Are you sure
There you go
Radio Button:
Bye
Hello
Menu Buttons:
Menu Button
Menu Button
ScrollView:
Re...
ProgressBar:
ProgressIndicator
Indeterminate:
ListView:
Item0
Item1
Item2
Item3
Item4
7
8
9
10
11

Gestione di base degli eventi

Basic Events

```
public class Event0 extends Application {
      public void start(Stage stage) {
        Button btn = new Button();
        btn.setText("Click me");
        Listener a=new Listener();
        btn.addEventHandler(Event.ANY, a);
        Group root = new Group(btn);
        Scene scene = new Scene(root, 300, 250);
         stage.setScene(scene);
        stage.sizeToScene();
        stage.show();    }
    public static void main(String[] args){
        Application.launch(args); }
}
class Listener implements EventHandler{
    int counter=0;
    public void handle(Event t) {
     System.out.println(++counter+" Ricevuto un evento di tipo "
        +t.getEventType()); } }
```

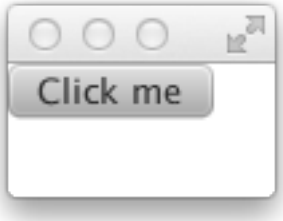
```
1 Ricevuto un evento di tipo
                INPUT_METHOD_TEXT_CHANGED
2 Ricevuto un evento di tipo MOUSE_ENTERED
3 Ricevuto un evento di tipo
                MOUSE_ENTERED_TARGET
4 Ricevuto un evento di tipo MOUSE_MOVED
…
12 Ricevuto un evento di tipo MOUSE_MOVED
13 Ricevuto un evento di tipo MOUSE_PRESSED
14 Ricevuto un evento di tipo ACTION
15 Ricevuto un evento di tipo MOUSE_RELEASED
16 Ricevuto un evento di tipo MOUSE_CLICKED
17 Ricevuto un evento di tipo MOUSE_MOVED
```



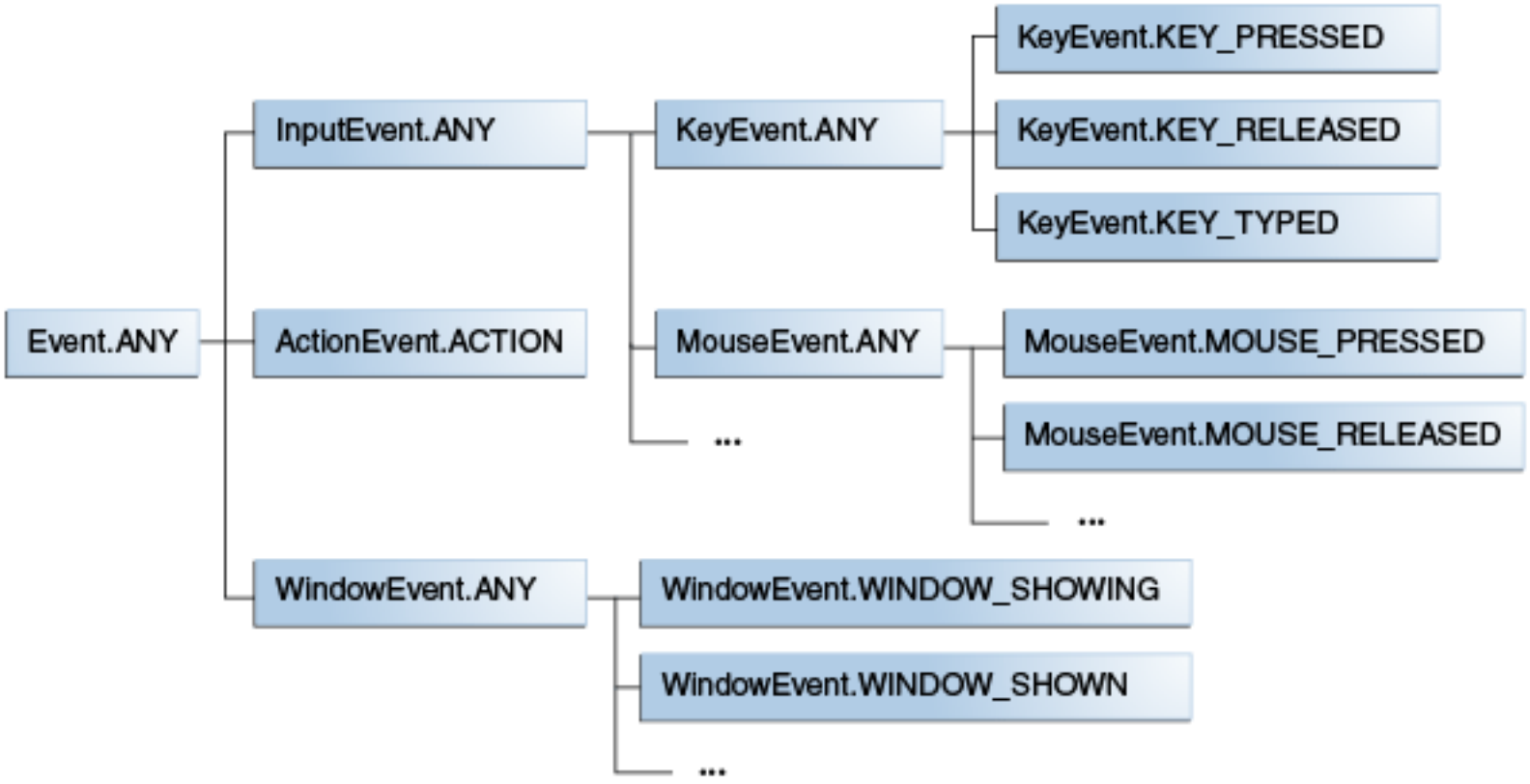
1 Ricevuto un evento di tipo ACTION

Basic Events

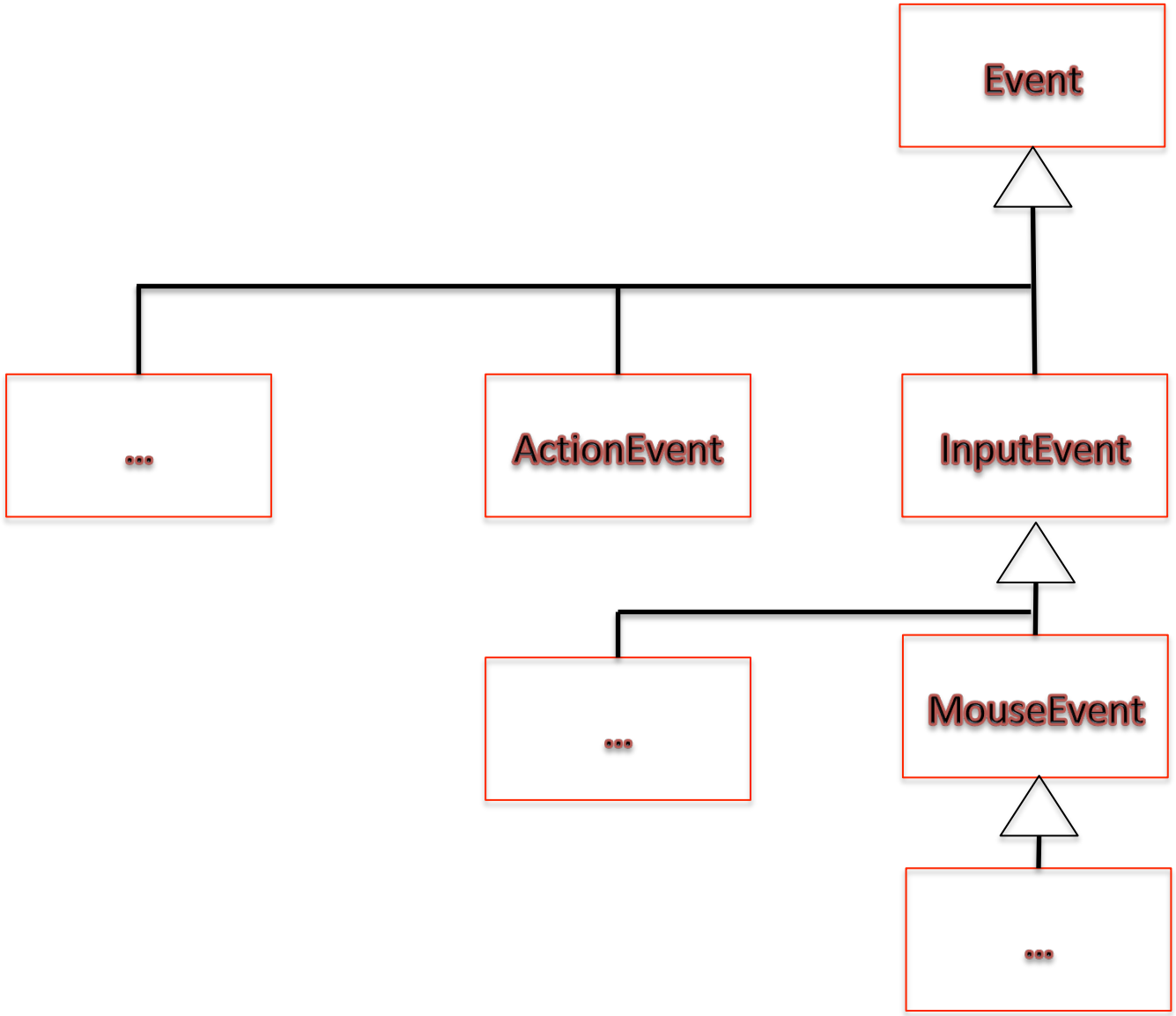
```
public class Event0 extends Application {
      public void start(Stage stage) {
        Button btn = new Button();
        btn.setText("Click me");
        Listener a=new Listener();
        btn.addEventHandler(ActionEvent.ACTION, a);
        Group root = new Group(btn);
        Scene scene = new Scene(root, 300, 250);
         stage.setScene(scene);
        stage.sizeToScene();
        stage.show();    }
    public static void main(String[] args){
        Application.launch(args); }
}
class Listener implements EventHandler{
    int counter=0;
    public void handle(Event t) {
     System.out.println(++counter+" Ricevuto un evento di tipo "
        +t.getEventType()); } }
```



Event hierarchy



Event

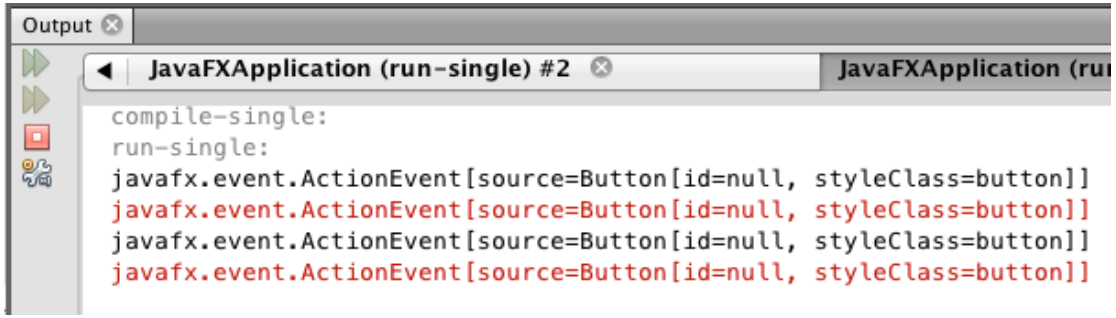


MultiListener

```
class OListener
      implements EventHandler{
  public void handle(Event t) {
       System.out.println(t); }
}
```

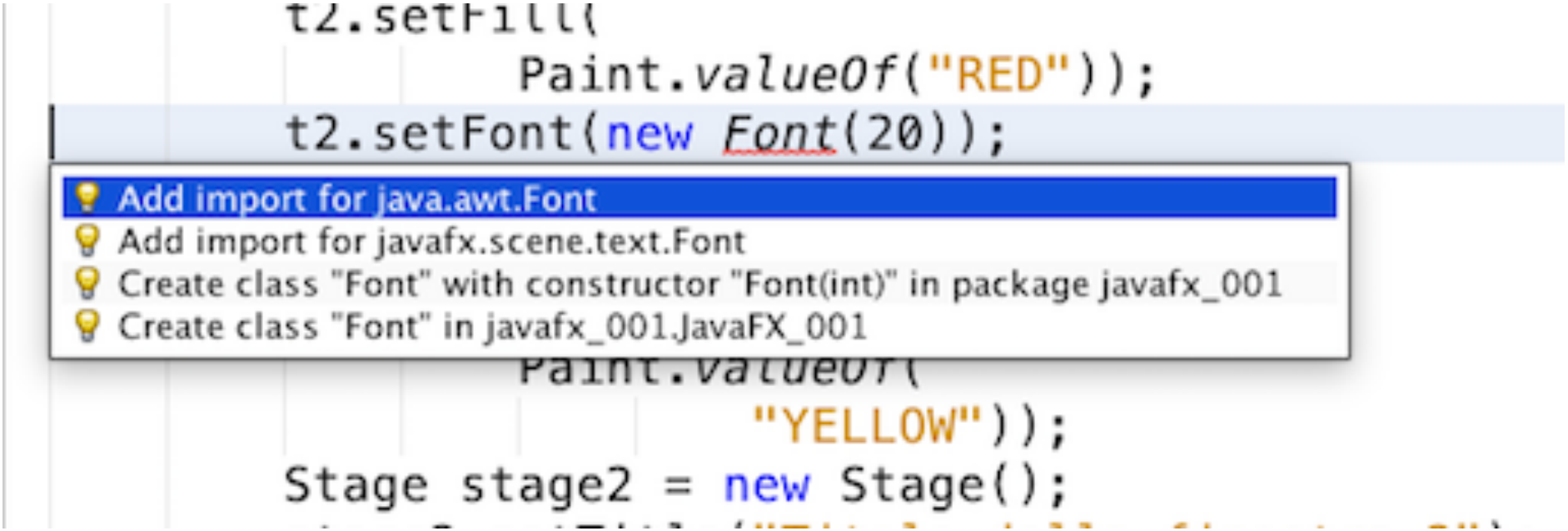
```
class EListener
      implements EventHandler{
  public void handle(Event t) {
       System.err.println(t); }
}
```

```
public class Event0 extends Application {
      public void start(Stage stage) {
        Button btn = new Button();
        btn.setText("Click me");
        Olistener o=new OListener();
        Elistener e=new EListener();
        btn.addEventHandler(ActionEvent.ACTION, o);
        btn.addEventHandler(ActionEvent.ACTION, e);
        Group root = new Group(btn);
        Scene scene = new Scene(root, 300, 250);
        stage (scene);
        stage ();
    }
    public static void main(String[] args){
      Application.launch(args);
    }
}
```



Tricks of the trade

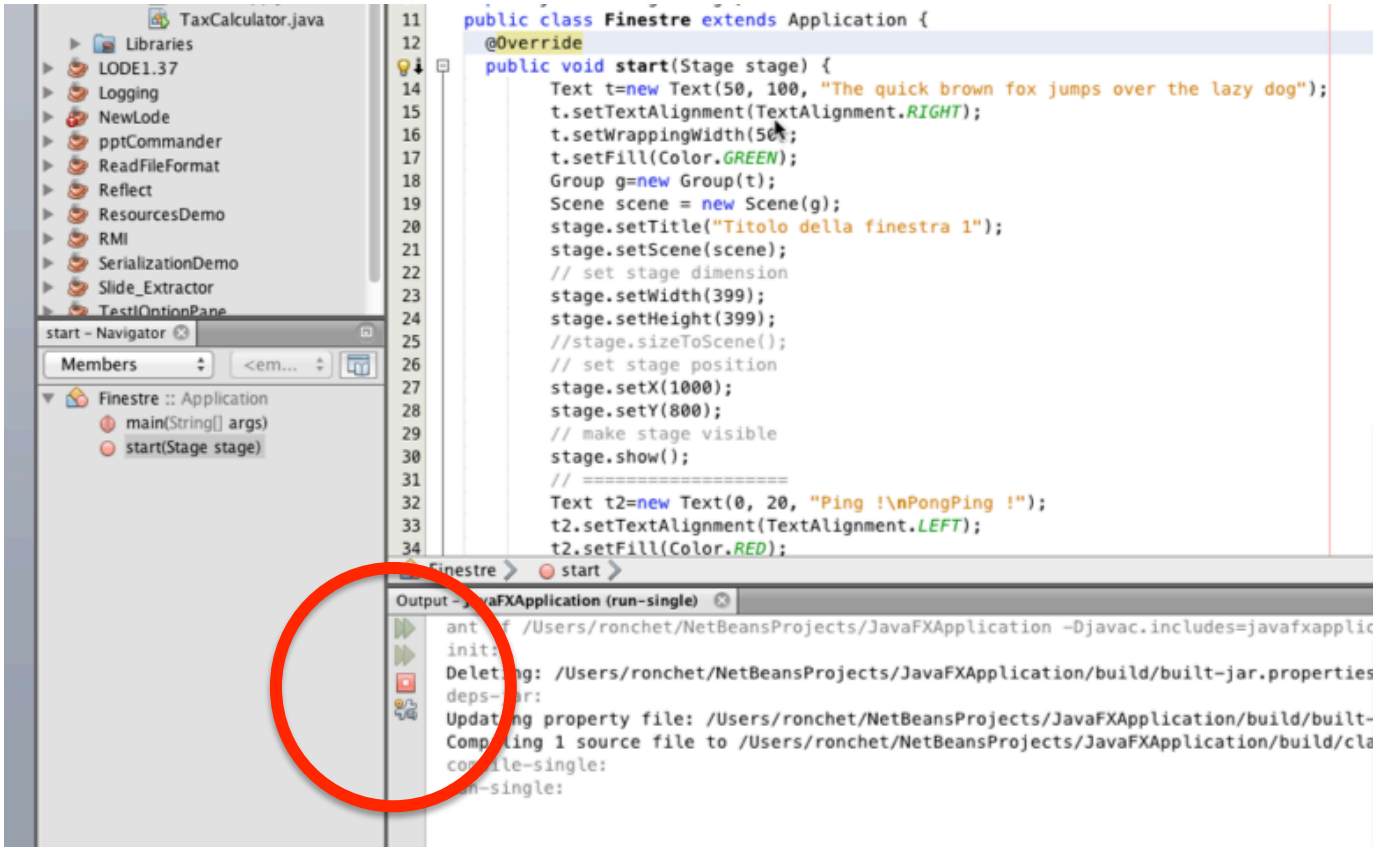
Attenzione agli import!



Terminazione

- Quando termina il processo?

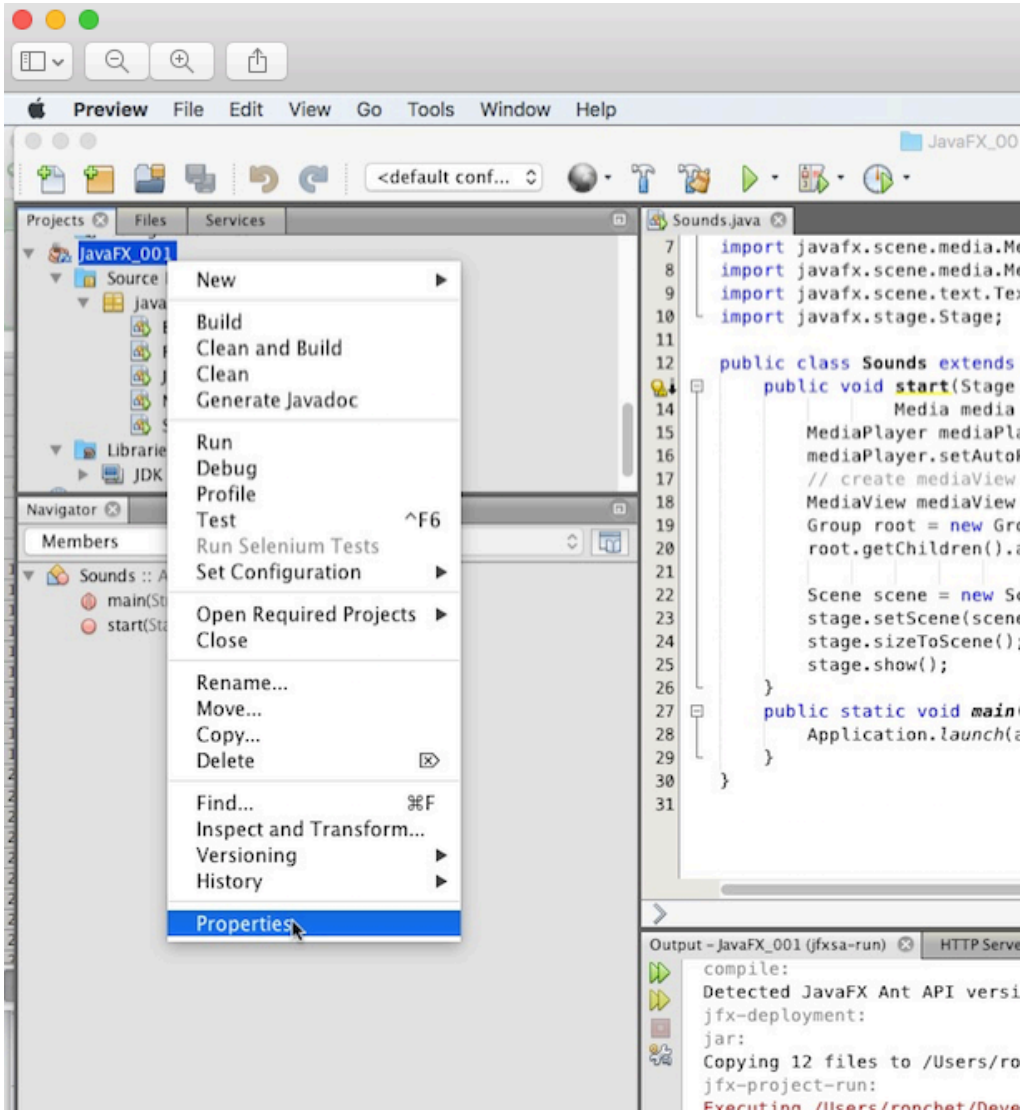
(Un Processo é un Programma in esecuzione)



Crea un programma distribuibile - 1

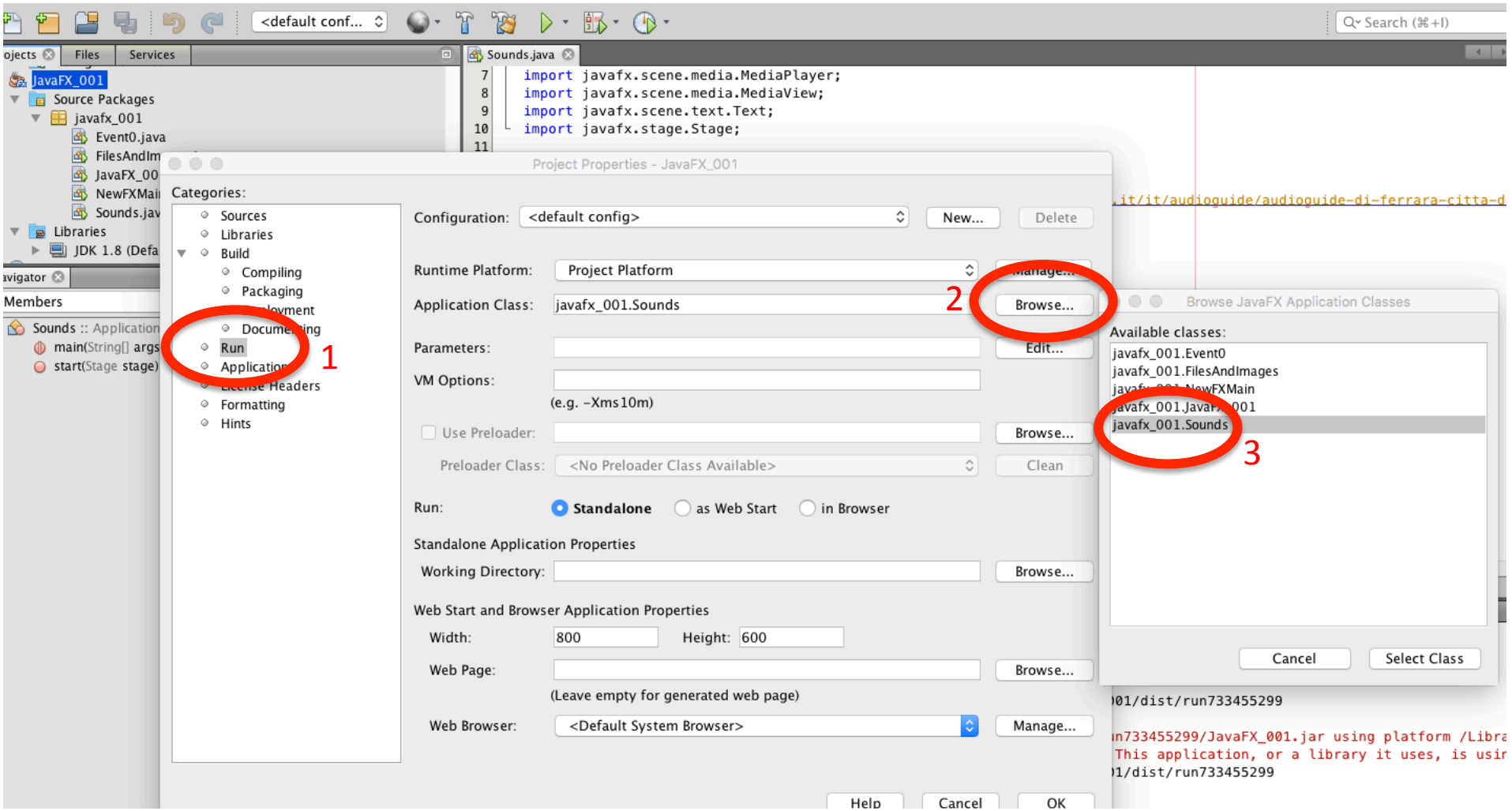
Go to Project Properties

(right click on the project)



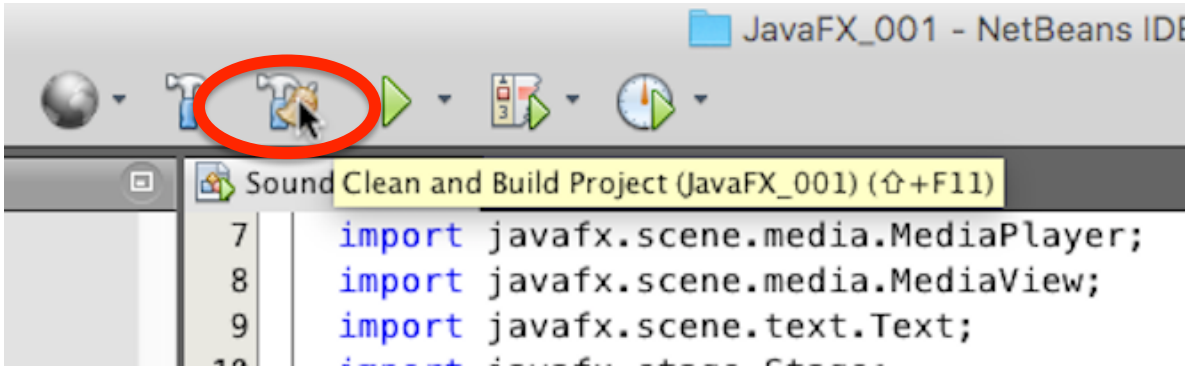
Crea un programma distribuibile – 2

Scegli “run” e seleziona la classe con il main che ti interessa



Crea un programma distribuibile - 3

Clean and build project



Go to the Files Tab,
Select the .jar file,
Right click on it,
Choose Tools -> Show in Finder.

Double clicking on the file
You will start the process.