

```

1  package com;
2
3
4  import com.fasterxml.jackson.dataformat.xml.XmlMapper;
5  import com.filehandeling.FileReader;
6  import com.filehandeling.FileWriter;
7  import javafx.application.Application;
8  import javafx.scene.Scene;
9  import javafx.scene.control.Button;
10 import javafx.scene.control.TextField;
11 import javafx.scene.control.ToggleButton;
12 import javafx.scene.control.ToggleGroup;
13 import javafx.scene.layout.BorderPane;
14 import javafx.scene.layout.HBox;
15 import javafx.scene.layout.Pane;
16 import javafx.scene.layout.VBox;
17 import javafx.scene.shape.Circle;
18 import javafx.scene.shape.Rectangle;
19 import javafx.stage.Stage;
20 import net.openhft.compiler.CompilerUtils;
21
22 import java.io.*;
23 import java.nio.file.Files;
24 import java.nio.file.Paths;
25 import java.util.ArrayList;
26
27
28 public class Demo extends Application {
29
30     private static final String ACTION_1 = "data.xml";
31     private static final String A_Z_A_Z = "[a-zA-Z]+";
32     private static final String NUMERIC = "[0-9]+";
33     private boolean chooseltRectangle = false;
34     private boolean getContentsCreated = false;
35     private boolean init = false;
36     private boolean contentsCreated = false;
37     private String object;
38     private String object2;
39     private int layoutX = 100;
40
41     private int layoutY = 70;
42     private int degree = 5;
43     private int rotateCounter = 0;
44     private ToggleGroup toggleGroup;
45     private ToggleButton tbCircle;
46     private ToggleButton tbRectan;
47     private Pane paneContents;
48     private BorderPane pane;
49     private ArrayList<Rectangle> rectangles;
50     private ArrayList<Circle> circles;
51     private ArrayList<ObjectClass> rectanglesObjects;
52     private ArrayList<ObjectClass> circlesObjects;
53     private ObjectListHandler objectListHandler;
54     private String priority;
55     private Button clear;
56     private Button rotateObject;
57     private Button createObject;
58     private Button saveObject;
59     private Button edit;
60     private Button classLoader;
61     private TextField recWidth;
62     private TextField recHeight;
63     private TextField rCircle;
64     private TextField index;
65     private Class aClass;
66     private Class aClass2;
67
68
69     @Override
70     public void start(Stage primaryStage) throws IllegalAccessException, InstantiationException {
71         pane = new BorderPane();
72         paneContents = new Pane();
73         pane.setPrefWidth(450);
74         pane.setPrefHeight(450);
75         pane.setLayoutY(60);
76
77         createSceneContents();
78
79         createObject.setOnAction(event -> {

```

```

80     if (!contentsCreated) {
81         createOtherSceneContents();
82         if (!getContentsCreated) {
83             getSources();
84         }
85         getObject('r');
86         getObject('c');
87     }
88     try {
89         createObject();
90     } catch (IllegalAccessException | InstantiationException e) {
91         e.printStackTrace();
92     }
93 });
94
95 classLoader.setOnAction(event -> {
96     if (!getContentsCreated) {
97         getSources();
98     }
99 });
100
101 rotateObject.setOnAction(event -> rotateObject());
102
103 saveObject.setOnAction(event -> {
104     try {
105         serializableToXML();
106     } catch (Exception e) {
107         System.out.println(e.getMessage());
108     }
109 });
110
111 clear.setOnAction(event -> clearScene());
112 edit.setOnAction(event -> editObject());
113
114
115 Scene scene = new Scene(paneContents, 650, 650);
116 primaryStage.setScene(scene);
117 primaryStage.show();
118
119 }
120
121 private void editObject() {
122     String inputIndex = index.getText();
123     if (!inputIndex.isEmpty() && (!inputIndex.matches(A_Z_A_Z))) {
124         int indexObject = Integer.valueOf(index.getText());
125         if (toggleGroup.getSelectedToggle() == tbRectan) {
126
127             if ((indexObject < rectangles.size()) && (checkInputRectangle())) {
128                 int height = Integer.valueOf(recWidth.getText());
129                 int width = Integer.valueOf(recHeight.getText());
130                 rectangles.get(indexObject).setHeight(height);
131                 rectangles.get(indexObject).setWidth(width);
132                 rectanglesObjects.get(indexObject).setValueHeight(width);
133                 rectanglesObjects.get(indexObject).setValueWidth(height);
134             }
135         } else if (toggleGroup.getSelectedToggle() == tbCircle) {
136             if ((indexObject < circles.size()) && (checkInputCircle())) {
137                 int rCircI = Integer.valueOf(rCircle.getText());
138                 circles.get(indexObject).setRadius(rCircI);
139                 circlesObjects.get(indexObject).setRadius(rCircI);
140             }
141         }
142     }
143 }
144
145 }
146
147 private boolean checkInputRectangle() {
148     String width = recWidth.getText();
149     String height = recHeight.getText();
150     if ((width.isEmpty() || height.isEmpty())
151         || (width.matches(A_Z_A_Z)
152             || height.matches(A_Z_A_Z)
153             || (width.matches(NUMERIC) && width.length() > 3)
154             || (height.matches(NUMERIC) && height.length() > 3))) {
155         return false;
156     } else {
157         return true;
158     }

```

```

159     }
160
161     private boolean checkInputCircle() {
162         String rCircI = rCircle.getText();
163         if ((rCircI.isEmpty()
164             || (rCircI.matches(A_Z_A_Z)
165                 || (rCircI.matches(NUMERIC) && rCircI.length() > 3)) {
166             return false;
167         } else {
168             return true;
169         }
170     }
171
172     private void createSceneContents() throws InstantiationException, IllegalAccessException {
173
174         createObject = new Button("Create");
175         rotateObject = new Button("Rotate");
176         saveObject = new Button("Save!!");
177         clear = new Button("Clear ");
178         classLoader = new Button("Class.L");
179         edit = new Button("Edit ");
180
181         VBox buttons = new VBox(10);
182         buttons.setLayoutX(570);
183         buttons.setLayoutY(470);
184         buttons.getChildren().addAll(classLoader, createObject, rotateObject, clear, saveObject);
185
186         if (init) {
187             createOtherSceneContents();
188             contentsCreated = true;
189             getContentsCreated = true;
190             getSources();
191             getObject("r");
192             getObject("c");
193             generateObjects(objectListHandler);
194         }
195         paneContents.getChildren().add(buttons);
196     }
197
198     private void createOtherSceneContents() {
199
200
201         contentsCreated = true;
202         HBox toggleBox = new HBox(20);
203         toggleBox.setLayoutX(10);
204         toggleBox.setLayoutY(10);
205
206         VBox rectangleSize = new VBox(3); // to put the rectangle toggle and his size field
207         HBox rectangleSizeField = new HBox(4);
208         VBox circleRadius = new VBox(3); // to put the Circule toggle and his radius field
209         VBox editVBox = new VBox(3);
210
211         recWidth = new TextField();
212         recWidth.setPrefSize(60, 20);
213
214         recHeight = new TextField();
215         recHeight.setPrefSize(60, 20);
216
217         rCircle = new TextField();
218         rCircle.setPrefSize(60, 20);
219
220         index = new TextField();
221         index.setPrefSize(60, 20);
222         index.setPrefSize(124, 20);
223
224
225         toggleGroup = new ToggleGroup();
226         tbCircle = new ToggleButton("Circle");
227         tbCircle.setPrefSize(60, 20);
228         tbRectan = new ToggleButton("Rectangle");
229         tbRectan.setPrefSize(124, 20);
230
231         rectangleSizeField.getChildren().addAll(recHeight, recWidth);
232         rectangleSize.getChildren().addAll(tbRectan, rectangleSizeField);
233         circleRadius.getChildren().addAll(tbCircle, rCircle);
234         editVBox.getChildren().addAll(edit, index);
235
236         tbCircle.setToggleGroup(toggleGroup);
237         tbRectan.setToggleGroup(toggleGroup);

```

```

238
239     toggleBox.getChildren().addAll(rectangleSize, circleRadius, editVBox);
240     paneContents.getChildren().addAll(toggleBox, pane);
241 }
242
243 private void generateObjects(ObjectListHandler objectClasses) throws IllegalAccessException,
InstantiationException {
244     rectangles = new ArrayList<>();
245     circles = new ArrayList<>();
246     int counter = priority.length();
247     int k = 0;
248     int c = 0;
249     int r = 0;
250     int height;
251     int width;
252     ObjectClass objectClass = null;
253
254     while (counter != 0) {
255         if (priority.charAt(k) == 'r') {
256
257             objectClass = (ObjectClass) aClass.newInstance();//getObject('r');
258
259             height = objectClasses.getRectangles().get(r).getValueHeight();
260             width = objectClasses.getRectangles().get(r).getValueWidth();
261
262             Rectangle rectangle = (Rectangle) objectClass.createObject(height, width);
263             rectangle.setLayoutX(objectClasses.getRectangles().get(r).getLayoutX());
264             rectangle.setLayoutY(objectClasses.getRectangles().get(r).getLayoutY());
265             rectangles.add(rectangle);
266             pane.getChildren().add(rectangle);
267             rotateCounter++;
268             chooseItRectangle = true;
269             r++;
270         } else {
271
272             objectClass = (ObjectClass) aClass2.newInstance();//getObject('c');
273
274
275             Circle circle = (Circle) objectClass.createObject(objectClasses.getCircles().get(c).getRadius());
276             circles.add(circle);
277             pane.getChildren().add(circle);
278             c++;
279         }
280         k++;
281         counter--;
282     }
283 }
284
285 private ObjectClass getObject(char type) {
286
287
288     try {
289         if (type == 'r') {
290
291             aClass = CompilerUtils.CACHED_COMPILER.loadFromJava("com.RectangleObject", object);
292             return (ObjectClass) aClass.newInstance();
293         } else if (type == 'c') {
294
295             aClass2 = CompilerUtils.CACHED_COMPILER.loadFromJava("com.CircObject", object2);
296             return (ObjectClass) aClass2.newInstance();
297         }
298     } catch (InstantiationException | IllegalAccessException | ClassNotFoundException e) {
299         e.printStackTrace();
300     }
301     return null;
302 }
303
304 private void setRectangleLayouts(Rectangle rectangle, ObjectClass objectClass) {
305
306     rectangle.setLayoutX(layoutX);
307     rectangle.setLayoutY(layoutY);
308     objectClass.setLayoutX(layoutX);
309     objectClass.setLayoutY(layoutY);
310
311 }
312
313 private void generateLayouts() {
314
315     layoutX += ((layoutX * 5) / 100);

```

```

316     layoutY += ((layoutY * 15) / 100);
317 }
318
319 private void setCircleLayouts(Circle circle) {
320
321     circle.setCenterX(250);
322     circle.setCenterY(250);
323 }
324
325
326 private void createObject() throws IllegalAccessException, InstantiationException {
327     ObjectClass objectClass;
328
329     if (toggleGroup.getSelectedToggle() == tbRectan) {
330         chooseRectangle = true;
331         priority += 'r';
332         objectClass = (ObjectClass) aClass.newInstance();//getObject('r');
333
334         addObject(objectClass, checkInputRectangle(), 'r');//
335
336     } else if (toggleGroup.getSelectedToggle() == tbCircle) {
337         priority += 'c';
338
339
340         objectClass = (ObjectClass) aClass2.newInstance();//getObject('c');
341
342         addObject(objectClass, checkInputCircle(), 'c');
343     }
344 }
345
346 private void getSources() {
347     FileReader fileReader = new FileReader();
348     String pathRes = "/Users/ziadelsarrih/Desktop/Labs/OOP/oop4/src/main/java/outResources/";
349     byte[] circlObject = fileReader.readFile(pathRes + "Obj1.txt");
350     byte[] rectangleObject = fileReader.readFile(pathRes + "Obj2.txt");
351     FileWriter fileWriter = new FileWriter();
352     object2 = new String(circlObject);
353     object = new String(rectangleObject);
354     String pathDest = "/Users/ziadelsarrih/Desktop/Labs/OOP/oop4/src/main/java/com/";
355     fileWriter.writeByte(circlObject, pathDest + "CirclObject.java");
356     fileWriter.writeByte(rectangleObject, pathDest + "RectangleObject.java");
357 }
358
359
360 private void addObject(ObjectClass objectClass, boolean b, char type) {
361
362     if (((rectanglesObjects == null) && (type == 'r'))) {
363
364         Rectangle rectangle;
365         if (!b) {
366             rectangle = (Rectangle) objectClass.createObject(300, 200);
367         } else {
368             rectangle = (Rectangle) objectClass.createObject(Integer.valueOf(recHeight.getText()), Integer.valueOf(recWidth.
369 getText()));
370         }
371         setRectangleLayouts(rectangle, objectClass);
372         pane.getChildren().add(rectangle);
373         rectangles = new ArrayList<>();
374         rectanglesObjects = new ArrayList<>();
375         rectangles.add(rectangle);
376         rectanglesObjects.add(objectClass);
377         generateLayouts();
378         rotateCounter++;
379     } else if ((circlesObjects == null) && (type == 'c')) {
380
381         Circle circle;
382         if (!b) {
383             circle = (Circle) objectClass.createObject(200);
384         } else {
385             circle = (Circle) objectClass.createObject(Integer.valueOf(rCircle.getText()));
386         }
387         setCircleLayouts(circle);
388         pane.getChildren().add(circle);
389         circles = new ArrayList<>();
390         circles.add(circle);
391         circlesObjects = new ArrayList<>();
392         circlesObjects.add(objectClass);
393     } else {
394         if (type == 'r') {

```

```

394         regenerateLastObject(objectClass, b, type);
395         rotateCounter++;
396     } else {
397
398         regenerateLastObject(objectClass, b, type);
399
400     }
401 }
402
403 }
404 }
405
406 private void regenerateLastObject(ObjectClass objectClass, boolean size, char type) {
407
408
409     int width = 0;
410     int height = 0;
411     int radius = 0;
412     if (!size) {
413         objectClass = generateNew(objectClass, type);
414     } else {
415
416         if (type == 'r') {
417             width = Integer.valueOf(recWidth.getText());
418             height = Integer.valueOf(recHeight.getText());
419             objectClass.setValueHeight(height);
420             objectClass.setValueWidth(width);
421         } else {
422             radius = Integer.valueOf(rCircle.getText());
423             objectClass.setRadius(radius);
424         }
425     }
426     if (type == 'r') {
427         Rectangle rectangle = (Rectangle) objectClass.createObject();
428         setRectangleLayouts(rectangle, objectClass);
429         pane.getChildren().add(rectangle);
430         rectangles.add(rectangle);
431         rectanglesObjects.add(objectClass);
432         generateLayouts();
433     } else {
434         Circle circle = (Circle) objectClass.createObject();
435         setCircleLayouts(circle);
436         pane.getChildren().add(circle);
437         circles.add(circle);
438         circlesObjects.add(objectClass);
439     }
440
441 }
442 }
443
444 public ObjectClass generateNew(ObjectClass objectClass, char type) {
445     ObjectClass o;
446     if (type == 'r') {
447         o = rectanglesObjects.get(rectangles.size() - 1);
448         int height = o.getValueHeight() - ((o.getValueHeight() * 10) / 100);
449         int width = o.getValueWidth() - ((o.getValueWidth() * 10) / 100);
450         objectClass.setValueHeight(height);
451         objectClass.setValueWidth(width);
452         return objectClass;
453     } else {
454         o = circlesObjects.get(circles.size() - 1);
455         int radius = (o.getRadius() - (o.getRadius() * 10 / 100));
456         objectClass.setRadius(radius);
457         return objectClass;
458     }
459 }
460 }
461
462 private void rotateObject() {
463     if (chooseRectangle) {
464         if (rotateCounter > 0) {
465             for (int i = rotateCounter - 1; i < rectangles.size(); i++) {
466                 rectangles.get(i).setRotate(degree);
467                 degree += 5;
468             }
469             rotateCounter--;
470         } else {
471             rotateCounter = rectangles.size() - 1;
472

```

```

473     }
474
475     }
476 }
477
478 private void clearScene() {
479     pane.getChildren().clear();
480     rectangles = null;
481     circles = null;
482     rectanglesObjects = null;
483     circlesObjects = null;
484     priority = "";
485     layoutX = 100;
486     layoutY = 70;
487
488 }
489
490 private void serializableToXML() throws IOException {
491     ObjectListHandler objectListHandlerTem = new ObjectListHandler();
492     objectListHandlerTem.setRectangles(rectanglesObjects);
493     objectListHandlerTem.setCircles(circlesObjects);
494     objectListHandlerTem.setPriorety(priority);
495     // if ((rectanglesObjects != null) && (circlesObjects != null)) {
496     try {
497         XmlMapper xmlMapper = new XmlMapper();
498         xmlMapper.writeValue(new File(ACTION_1), objectListHandlerTem);
499     } catch (FileNotFoundException e) {
500         System.out.println(e.getMessage());
501     }
502     // }
503 }
504
505 public void init() throws IOException {
506
507     priority = "";
508     XmlMapper xmlMapper = new XmlMapper();
509     File file = new File(ACTION_1);
510     // ObjectListHandler objectListHandler = new ObjectListHandler();
511     if (file.exists()) {
512         String xml = new String(Files.readAllBytes(Paths.get(ACTION_1)));
513         objectListHandler = xmlMapper.readValue(xml, ObjectListHandler.class);
514         init = objectListHandler != null;
515         if (objectListHandler != null) {
516             circlesObjects = objectListHandler.getCircles();
517             rectanglesObjects = objectListHandler.getRectangles();
518             priority = objectListHandler.getPriorety();
519         }
520
521     }
522
523 }
524
525
526 public static void main(String[] args) {
527     launch(args);
528 }
529 }
530

```

```
1 package com;  
2  
3 public class Controller {  
4 }  
5
```



```
1 package com;
2
3 import javafx.scene.paint.Color;
4 import javafx.scene.paint.Paint;
5 import javafx.scene.shape.Shape;
6
7 import java.io.Serializable;
8 import java.util.Random;
9
10 public class ObjectClass implements Serializable {
11     public int red;
12     public int green;
13     public int blue;
14     public int valueHeight;
15     public int valueWidth;
16     public int radius;
17     public int layoutX;
18     public int layoutY;
19
20
21     public ObjectClass(int radius) {
22         this.radius = radius;
23     }
24
25     public ObjectClass() {
26     }
27
28     public ObjectClass(int valueHeight, int valueWidth) {
29
30     }
31
32     public Shape createObject(int radius) {
33         return null;
34     }
35
36     public Shape createObject() {
37
38         return null;
39     }
40
41     public Shape createObject(int valueHeight, int valueWidth) {
42
43         return null;
44     }
45
46     public void randomColour() {
47         Random random = new Random();
48         this.red = random.nextInt(255);
49         this.green = random.nextInt(255);
50         this.blue = random.nextInt(255);
51     }
52
53
54     protected Paint getPaint() {
55         return Color.rgb(red, green, blue);
56     }
57
58     public void setColor(int red, int green, int blue) {
59         this.red = red;
60         this.green = green;
61         this.blue = blue;
62     }
63
64     public Shape Drawable() {
65         return null;
66     }
67
68     public int getRed() {
69         return red;
70     }
71
72     public int getGreen() {
73         return green;
74     }
75
76     public int getBlue() {
77         return blue;
78     }
79 }
```

```
80     public int getValueHeight() {
81         return valueHeight;
82     }
83
84     public void setValueHeight(int valueHeight) {
85         this.valueHeight = valueHeight;
86     }
87
88     public int getValueWidth() {
89         return valueWidth;
90     }
91
92     public void setValueWidth(int valueWidth) {
93         this.valueWidth = valueWidth;
94     }
95
96     public int getRadius() {
97         return radius;
98     }
99
100    public void setRadius(int radius) {
101        this.radius = radius;
102    }
103
104    public int getLayoutX() {
105        return layoutX;
106    }
107
108    public void setLayoutX(int layoutX) {
109        this.layoutX = layoutX;
110    }
111
112    public int getLayoutY() {
113        return layoutY;
114    }
115
116    public void setLayoutY(int layoutY) {
117        this.layoutY = layoutY;
118    }
119 }
120
121
```

```
1 package com;
2
3
4 import java.io.Serializable;
5 import java.util.ArrayList;
6
7 public class ObjectListHandler implements Serializable {
8     private ArrayList<ObjectClass> rectangles;
9     private ArrayList<ObjectClass> circles;
10    private String priorety;
11
12    public String getPriorety() {
13        return priorety;
14    }
15
16    public void setPriorety(String priorety) {
17        this.priorety = priorety;
18    }
19
20    public ArrayList<ObjectClass> getRectangles() {
21        return rectangles;
22    }
23
24    public void setRectangles(ArrayList<ObjectClass> rectangles) {
25        this.rectangles = rectangles;
26    }
27
28    public ArrayList<ObjectClass> getCircles() {
29        return circles;
30    }
31
32    public void setCircles(ArrayList<ObjectClass> circles) {
33        this.circles = circles;
34    }
35
36
37 }
38
```