

```
1 //*****
2 // Kathleen Kunsman
3 // May 11, 2011
4 // Object Oriented Programming
5 // FINAL PROJECT
6 // GeoSolids.java
7 //*****
8
9 import javax.swing.*;
10
11
12 public class GeoSolids
13 {
14
15     //-----
16     // Creates and presents the program files
17     //-----
18
19     public static void main (String[] args)
20     {
21         JFrame frame = new JFrame ("Geo Solids");
22         frame.setDefaultCloseOperation (JFrame.EXIT_ON_CLOSE);
23
24         JTabbedPane geo = new JTabbedPane();
25         geo.addTab ("Cylinder", new GeoSolidsPanelCylinder());
26         geo.addTab ("Cone", new GeoSolidsPanelCone());
27
28         frame.getContentPane().add(geo);
29
30
31         frame.pack();
32         frame.setVisible(true);
33     }
34 }
35
36 //*****
37 // Kathleen Kunsman
38 // May 11, 2011
39 // Object Oriented Programming
40 // Final Project
41 // GeoSolid.java
42 //*****
43
44 public class GeoSolid
45 {
46
47     protected int radius;
48     protected int height;
49
50     //-----
51     // Constructor: Sets up radius and height
52     //-----
53     public GeoSolid (int rad, int ht)
54     {
55         radius=rad;
56
```

```
57         height=ht;
58     }
59
60     //-----
61     // Radius mutator.
62     //-----
63     public void setRadius(int rad)
64     {
65         radius = rad;
66     }
67
68     //-----
69     // Radius accessor.
70     //-----
71     public int getRadius()
72     {
73         return radius;
74     }
75
76     //-----
77     // Height mutator.
78     //-----
79     public void setHeight(int ht)
80     {
81         height = ht;
82     }
83
84     //-----
85     // Height accessor.
86     //-----
87     public int getHeight()
88     {
89         return height;
90     }
91
92 }
93
94
95 //*****
96 // Kathleen Kunsman
97 // May 11, 2011
98 // Object Oriented Programming
99 // Final Project
100 // GeoSolidsPanel.java
101 //*****
102
103 import java.text.DecimalFormat;
104 import javax.swing.*;
105 import java.awt.*;
106 import java.awt.event.*;
107 import java.util.Scanner;
108
109
110 public class GeoSolidsPanel extends JPanel
111
112 {
```

```
113     private JPanel intro, entry, calc, input, answer;
114     private JLabel introText, radiusLabel, heightLabel, volumeLabel,
... surfaceLabel, answerV, answerS;
115     private JButton cylinder;
116     private JTextField radiusInput, heightInput;
117
118
119     //-----
120     // Set up Button, BoxLayouts and BorderLayouts
121     //-----
122     public GeoSolidsPanel()
123     {
124
125         setLayout (new BorderLayout());
126
127         //-----
128         // NORTH: Intro Instruction
129         //-----
130         introText=new JLabel("Enter dimensions to calculate the volume and
... surface area of a cylinder.");
131         introText.setFont (new Font ("Helvetica", Font.BOLD, 12));
132
133         intro=new JPanel();
134         BoxLayout layout0 = new BoxLayout(intro, BoxLayout.X_AXIS);
135         intro.add (introText);
136         intro.setLayout (layout0);
137         intro.add (Box.createRigidArea(new Dimension(0,10)));
138         intro.setPreferredSize (new Dimension(400,50));
139
140
141         //-----
142         // WEST: Input
143         //-----
144         radiusLabel=new JLabel("Enter the Radius: ");
145         radiusLabel.setFont (new Font ("Helvetica", Font.PLAIN, 12));
146         heightLabel=new JLabel("Enter the Height: ");
147         heightLabel.setFont (new Font ("Helvetica", Font.PLAIN, 12));
148
149         entry=new JPanel();
150         BoxLayout layout1 = new BoxLayout(entry, BoxLayout.Y_AXIS);
151         entry.setLayout (layout1);
152         entry.add (radiusLabel);
153         radiusInput = new JTextField();
154         radiusInput.addActionListener (new CalcListener());
155         entry.add (radiusInput);
156         heightInput = new JTextField();
157         heightInput.addActionListener (new CalcListener());
158         entry.add (heightLabel);
159         entry.setPreferredSize (new Dimension(100,75));
160         entry.add (heightInput);
161
162
163         //-----
164         // CENTER: Input
165         //-----
166         input =new JPanel();
```

```
167         BorderLayout layout3 = new BorderLayout(input, BorderLayout.Y_AXIS);
168         input.setLayout (layout3);
169
170
171         //-----
172         // EAST: Calculate Button
173         //-----
174
175         cylinder = new JButton ("", new ImageIcon("cylinder.jpg"));
176         calc=new JPanel();
177         BorderLayout layout2 = new BorderLayout(calc, BorderLayout.Y_AXIS);
178         calc.setLayout (layout2);
179         calc.add (cylinder);
180         CalcListener listener = new CalcListener();
181         cylinder.addActionListener (listener);
182
183
184         //-----
185         // SOUTH: Answer
186         //-----
187         answer =new JPanel();
188         BorderLayout layout4 = new BorderLayout(answer, BorderLayout.X_AXIS);
189         answer.setLayout (layout4);
190         answer.setBackground (Color.white);
191         answer.setPreferredSize (new Dimension(400,25));
192         volumeLabel=new JLabel("");
193         volumeLabel.setFont (new Font ("Helvetica", Font.BOLD, 12));
194         answerV=new JLabel("");
195         answerV.setFont (new Font ("Helvetica", Font.PLAIN, 12));
196         surfaceLabel=new JLabel("");
197         surfaceLabel.setFont (new Font ("Helvetica", Font.BOLD, 12));
198         answerS=new JLabel("");
199         answerS.setFont (new Font ("Helvetica", Font.PLAIN, 12));
200         answer.add (volumeLabel);
201         answer.add (answerV);
202         answer.add (Box.createRigidArea(new Dimension(10,10)));
203         answer.add (surfaceLabel);
204         answer.add (answerS);
205
206         add(intro, BorderLayout.NORTH);
207         add(entry, BorderLayout.WEST);
208         add(calc , BorderLayout.EAST);
209         add(input, BorderLayout.CENTER);
210         add(answer, BorderLayout.SOUTH);
211
212     }
213
214
215     //-----
216     // Represents the listener for radio buttons
217     //-----
218     private class CalcListener implements ActionListener
219     {
220
221         //-----
222         // Displays text representing user radio picks and computer random picks
```

```
223 //-----
224     public void actionPerformed (ActionEvent event)
225     {
226         int cylinderHeight, cylinderRadius;
227         double v1, s1;
228
229         String radiusText=radiusInput.getText();
230         String heightText=heightInput.getText();
231
232         cylinderRadius = Integer.parseInt(radiusText);
233         cylinderHeight = Integer.parseInt(heightText);
234
235         GeoCylinder cylinder1 = new GeoCylinder(cylinderRadius,
... cylinderHeight);
236         v1 = cylinder1.CalcVolume();
237         s1 = cylinder1.CalcSurface();
238
239         DecimalFormat format = new DecimalFormat ("0.##");
240
241         volumeLabel.setText("Volume: ");
242         answerV.setText (format.format(v1));
243         surfaceLabel.setText("Surface Area: ");
244         answerS.setText (format.format(s1));
245     }
246 }
247 }
248
249
250 //*****
251 // Kathleen Kunsman
252 // May 11, 2011
253 // Object Oriented Programming
254 // Final Project
255 // GeoSolidsPanelCone.java
256 //*****
257
258 import java.text.DecimalFormat;
259 import javax.swing.*;
260 import java.awt.*;
261 import java.awt.event.*;
262 import java.util.Scanner;
263
264
265 public class GeoSolidsPanelCone extends JPanel
266
267 {
268     private JPanel intro, entry, calc, input, answer;
269     private JLabel introText, radiusLabel, heightLabel, volumeLabel,
... surfaceLabel, answerV, answerS;
270     private JButton cone;
271     private JTextField radiusInput, heightInput;
272
273
274 //-----
275 // Set up Button, BoxLayouts and BorderLayouts
276 //-----
```

```
277     public GeoSolidsPanelCone()
278     {
279
280         setLayout (new BorderLayout());
281
282         //-----
283         // NORTH: Intro Instruction
284         //-----
285         introText=new JLabel("Enter dimensions to calculate the volume and
... surface area of a cone.");
286         introText.setFont (new Font ("Helvetica", Font.BOLD, 12));
287
288         intro=new JPanel();
289         BorderLayout layout0 = new BorderLayout(intro, BorderLayout.X_AXIS);
290         intro.add (introText);
291         intro.setLayout (layout0);
292         intro.add (Box.createRigidArea(new Dimension(0,10)));
293         intro.setPreferredSize (new Dimension(425,50));
294
295
296         //-----
297         // WEST: Input
298         //-----
299         radiusLabel=new JLabel("Enter the Radius: ");
300         radiusLabel.setFont (new Font ("Helvetica", Font.PLAIN, 12));
301         heightLabel=new JLabel("Enter the Height: ");
302         heightLabel.setFont (new Font ("Helvetica", Font.PLAIN, 12));
303
304         entry=new JPanel();
305         BorderLayout layout1 = new BorderLayout(entry, BorderLayout.Y_AXIS);
306         entry.setLayout (layout1);
307         entry.add (radiusLabel);
308         radiusInput = new JTextField();
309         radiusInput.addActionListener (new CalcListener());
310         entry.add (radiusInput);
311         heightInput = new JTextField();
312         heightInput.addActionListener (new CalcListener());
313         entry.add (heightLabel);
314         entry.setPreferredSize (new Dimension(100,75));
315         entry.add (heightInput);
316
317
318         //-----
319         // CENTER: Input
320         //-----
321         input =new JPanel();
322         BorderLayout layout3 = new BorderLayout(input, BorderLayout.Y_AXIS);
323         input.setLayout (layout3);
324
325
326         //-----
327         // EAST: Calculate Button
328         //-----
329
330         cone = new JButton ("Cone");
331         calc=new JPanel();
```

```
332     BorderLayout layout2 = new BorderLayout(calc, BorderLayout.Y_AXIS);
333     calc.setLayout (layout2);
334     calc.add (cone);
335     CalcListener listener = new CalcListener();
336     cone.addActionListener (listener);
337
338
339     //-----
340     // SOUTH: Answer
341     //-----
342     answer =new JPanel();
343     BorderLayout layout4 = new BorderLayout(answer, BorderLayout.X_AXIS);
344     answer.setLayout (layout4);
345     answer.setBackground (Color.white);
346     answer.setPreferredSize (new Dimension(425,25));
347     volumeLabel=new JLabel("");
348     volumeLabel.setFont (new Font ("Helvetica", Font.BOLD, 12));
349     answerV=new JLabel("");
350     answerV.setFont (new Font ("Helvetica", Font.PLAIN, 12));
351     surfaceLabel=new JLabel("");
352     surfaceLabel.setFont (new Font ("Helvetica", Font.BOLD, 12));
353     answerS=new JLabel("");
354     answerS.setFont (new Font ("Helvetica", Font.PLAIN, 12));
355     answer.add (volumeLabel);
356     answer.add (answerV);
357     answer.add (Box.createRigidArea(new Dimension(10,10)));
358     answer.add (surfaceLabel);
359     answer.add (answerS);
360
361     add(intro, BorderLayout.NORTH);
362     add(entry, BorderLayout.WEST);
363     add(calc , BorderLayout.EAST);
364     add(input, BorderLayout.CENTER);
365     add(answer, BorderLayout.SOUTH);
366
367 }
368
369
370 //-----
371 // Represents the listener for radio buttons
372 //-----
373     private class CalcListener implements ActionListener
374     {
375
376         //-----
377         // Displays text representing user radio picks and computer random picks
378         //-----
379         public void actionPerformed (ActionEvent event)
380         {
381             int coneHeight, coneRadius;
382             double v1, s1;
383
384             String radiusText=radiusInput.getText();
385             String heightText=heightInput.getText();
386
387             coneRadius = Integer.parseInt(radiusText);
```

```
388         coneHeight = Integer.parseInt(heightText);
389
390         GeoCone conel = new GeoCone(coneRadius, coneHeight);
391         v1 = conel.CalcVolume();
392         s1 = conel.CalcSurface();
393
394         DecimalFormat format = new DecimalFormat ("0.##");
395
396         volumeLabel.setText("Volume: ");
397         answerV.setText (format.format(v1));
398         surfaceLabel.setText("Surface Area: ");
399         answerS.setText (format.format(s1));
400     }
401 }
402 }
403
404 //*****
405 // Kathleen Kunsman
406 // May 11, 2011
407 // Object Oriented Programming
408 // Final Project
409 // GeoCone.java
410 //*****
411 import java.text.DecimalFormat;
412
413 public class GeoCone extends GeoSolid
414 {
415     public double volume;
416     public double surface;
417
418     //-----
419     // Constructor
420     //-----
421     public GeoCone(int rad, int ht)
422     {
423         super(rad, ht);
424     }
425
426     //-----
427     // Calculates volume
428     //-----
429
430     public double CalcVolume()
431     {
432         double volume = (Math.PI*Math.pow(radius,2)*height)/3;
433
434         return volume;
435     }
436
437     //-----
438     // Calculates surface
439     //-----
440
441     public double CalcSurface()
442     {
443         double surface =
```



```
443... (Math.PI*Math.pow(radius,2))+(Math.PI*radius*(Math.sqrt(Math.pow(height,2)+
... Math.pow(radius,2))));
444
445     return surface;
446 }
447
448 //-----
449 // toString
450 //-----
451
452 public String toString()
453 {
454     DecimalFormat format = new DecimalFormat ("0.##");
455     return ("The volume of the cone is " + format.format(volume) + "and the
... surface is " + format.format(surface)+".");
456 }
457
458
459
460 }
461
462
463
464
```