```
⚠ CircleDrawerComponent.java
♠ CircleDrawerFrame.java
  2 * Devante Wilson
  3 * November 20, 2015
  5 * Question 1
  7 * Program allows user to specify
  8 * a circle by clicking on the center
    * and typing the radius
 10 *
 11 * Class designs a JFrame
 12 */
 14 // import classes
 15@ import javax.swing.JFrame;
 16 import java.awt.event.MouseEvent;
 17 import java.awt.event.MouseListener;
 18 import java.awt.Dimension;
 19 import javax.swing.JOptionPane;
21 public class CircleDrawerFrame extends JFrame
 22 {
 23
        // specify instance and class variables
 24
        private CircleDrawerComponent component;
 25
        public int radius;
 26
       static final int FRAME_WIDTH = 500, FRAME_HEIGHT= 500;
 28
        // constructor
 29⊖
       CircleDrawerFrame()
 30
 31
            component = new CircleDrawerComponent();
 32
            component.setPreferredSize(new Dimension(400,350));
 33
 34⊖
            class MousePressListener implements MouseListener
 35
 36
≥37⊝
                 // determine if mouse was pressed
                 public void mousePressed(MouseEvent e)
 38
 39
                    // define variables/objects
 40
                    int x = e.getX();
 41
42
                    int y = e.getY();
                    String ansRadius = JOptionPane.showInputDialog("Enter radius"); // prompt user
 43
 44
                    radius = Integer.parseInt(ansRadius); // radius of ellipse
 45
                    component.setPositionAndSize(x,y,radius); // positioning
 46
47
48
                // unaltered methods from MouseListener
 49
                public void mouseClicked(MouseEvent e) {}
 50
 51
                public void mouseReleased(MouseEvent e) {}
 52
 53
                public void mouseEntered(MouseEvent e) {}
 54
 55
                public void mouseExited(MouseEvent e) {}
 56
            }
 57
 58
            MousePressListener listener = new MousePressListener(); // new listener object
 59
            component.addMouseListener(listener); // add listener to component
 60
            setSize(FRAME WIDTH, FRAME HEIGHT); // set size of frame
            add(component); // add component to frame
 62
 63 }
```

```
🔬 CircleDrawerComponent.java 🛭 🕡 CircleDrawerFrame.java 🕡 CircleDrawerTest.java
 2⊕ * Devante Wilson...
 15@ import java.awt.Color;
16 import java.awt.Graphics;
17 import java.awt.Graphics2D;
18 import javax.swing.JComponent;
20 import java.awt.geom.Ellipse2D;
 21
22 public class CircleDrawerComponent extends JComponent
23 {
 24
         // specify instance variables
 25
        private int x, y, radius;
 27
        // mutator method
        public void setPositionAndSize(int x, int y, int radius)
 28⊖
 29
 30
             this.x = x;
             this.y = y;
 31
             this.radius = radius;
 32
 33
 34
        // draw the circle
35
△36⊝
        public void paintComponent(Graphics g)
 37
 38
             super.paintComponent(g);
 39
             Graphics2D g2 = (Graphics2D) g;
 40
 41
            Ellipse2D.Double ellipse
                 = new Ellipse2D.Double(x - radius, y - radius, radius * 2, radius * 2);
 42
 43
 44
             // set color
            g2.setColor(Color.red);
 45
 46
              // draw onto graphics context
 47
             g2.draw(ellipse);
 48
 49
             // call repaint as visual properties were altered
 50
             repaint();
 51
 52
 53
        // default no parameter constructor
 54⊖
       public CircleDrawerComponent()
                                                                                                                _ 🗆 ×
                                                                                            Ouestion 1 - Circle Drawer
 55
 56
 57
58 }
                                                                                            OK Cancel
☑ CircleDrawerComponent.java
☑ CircleDrawerFrame.java
☑ CircleDrawerTest.java
  2⊕ * Devante Wilson.
 15 import javax.swing.JFrame;
17 public class CircleDrawerTest
19⊝
        public static void main(String[] args)
20
21
            // define objects
22
23
            JFrame frame = new CircleDrawerFrame();
24
25
            // set frame properties
            frame.setTitle("Question 1 - Circle Drawer");
26
27
            frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
            frame.setVisible(true);
28
29 }
```

```
🗓 Employee.java 🛭 🖟 Manager.java 🗘 Executive.java 🖟 RodomShapeG... 🖟 RodomShapeG... 🖟 RodomShapeG... 🖟 RandomShapeG...
 10/**
                                                      2⊕ * Devante Wilson.
 2 * Devante Wilson
 3 * November 21, 2015
                                                     12 public class Manager extends Employee
 4
                                                     13 {
 5 * Question 2
                                                     14
                                                            // instance variable(s)
                                                     15
                                                            private String department;
    * Program describes a set of
                                                    16
 8 * entities of a company such as
                                                     17
                                                            // constructor/mutator method
 9 * an employee, manager and executive.
                                                    18⊝
                                                         public Manager(String name, double salary, String department)
                                                    19
 11
                                                     20
                                                                super(name, salary);
 12 public class Employee
                                                     21
                                                                this.department = department;
 13 {
                                                     22
                                                            }
14
        // instance variables
                                                     23
      private String name;
15
                                                    24
                                                            // retrieve info.
 16
       private double salary;
                                                    25⊝
                                                           public String toString()
 17
                                                     26
18
       // constructor/mutator method
                                                                return super.toString() + department + "\n";
      public Employee(String name, double salary)
190
                                                     2.8
                                                     29
21
            this.name = name;
                                                     30
                                                            // default no parameter constructor
22
            this.salary = salary;
                                                     31⊝
                                                            public Manager()
23
       }
                                                     32
 24
                                                    33
25
       // retrieve info.
                                                     34
                                                            }
26⊖
       public String toString()
                                                    35 }
27
28
            return "name: " + name +
 29
                  "\nsalary: " + salary +
 30
                  "\n";
      }
 32
 33
      // default no parameter constructor
34⊖
       public Employee()
35
36
37
38 }
🗓 Employee.java 🗓 Manager.java 🗓 Executive.java 🛭 🗓 Q2Tester.java 🛍 RandomShapeG... 🔬 RandomSh
 2 * Devante Wilson
 3 * November 21, 2015
 4 *
    * Question 2
 6 *
 7 * Program describes a set of
    * entities of a company such as
  9 * an employee, manager and executive.
 10 */
 12 public class Executive extends Manager
 13 {
 14
        // constructor/mutator method
       public Executive (String name, double salary, String department)
 15⊜
 16
            super(name, salary, department);
 18
 19
       // retrieve info.
 21⊖
       public String toString()
 22
 23
            return super.toString();
 24
 25
        // default no parameter constructor
 26
 27⊜
       public Executive()
 28
 29
        }
31 }
```

```
☑ Employee.java
☑ Manager.java
☑ Executive.java
☑ Q2Tester.java
☒ ☑ RandomShapeG...
☑ RandomShapeG...
                                                                                                        ■ Console \( \times \)
 2⊕ * Devante Wilson.
                                                                                                        <terminated> Q2Tester [Java Applicatio
 13
                                                                                                        name: Employee name
 14 public class Q2Tester
 15 {
                                                                                                        salary: 1.0
16⊝
         public static void main(String[] args)
 17
 18
                                                                                                       name: Manager name
              // create objects
             Employee emp = new Employee("Employee name", 1);
Manager ma = new Manager("Manager name", 2, "Manager department");
 19
                                                                                                        salary: 2.0
                                                                                                       Manager department
 21
22
23
             Executive ex = new Executive("Executive name", 3, "Executive department");
             // call methods and print results
                                                                                                       name: Executive name
 24
25
26
27
              System.out.println(emp.toString()); // employee info.
                                                                                                       salary: 3.0
              System.out.println(ma.toString()); // manager info.
System.out.println(ex.toString()); // executive info.
                                                                                                       Executive department
         }
28 }
```

```
☑ RandomShapeGe... 
☐ RandomShapeCo...
☑ RandomShapeVie...
                                                  J Circle!
2⊕ * Devante Wilson...
120 import java.awt.Rectangle; ...
17
 18 public class RandomShapeGenerator
19 {
20
        // declare class variables
21
       static Random generator;
       static int windowW, windowH;
23
 24
       // constructor
25⊖
       public RandomShapeGenerator(int w, int h)
 26
27
           // set random generator
 28
           generator = new Random();
29
 30
           // set window width and height
 31
            windowW = w;
32
            windowH = h;
 33
       }
 34
 35⊜
        /* generate a random shape
        * Greturn a shape: rectangle, ellipse, or line
36
 37
38⊝
        public Shape randomShape()
 39
 40
            int s = generator.nextInt(3);  // hold random shape
 41
            int x = generator.nextInt(windowW); // horizontal boundary is window width
 42
           int y = generator.nextInt(windowH); // vertical boundary is window height
 43
 44
           // dimensions of shapes
 45
           final int WIDTH = 20;
 46
           final int HEIGHT = 15;
 47
 48
           if (s == 0) // return a rectangle
 49
 50
                return new Rectangle (x, y, WIDTH, HEIGHT);
 51
 52
            else if (s == 1) // return an ellipse
53
 54
                return new Ellipse2D.Double(x, y, WIDTH, HEIGHT);
55
 56
            else // return a line
 57
 58
                // compensate for x2, y2, coordinates (as if they were length/width)
59
                return new Line2D.Double(x, y, x + WIDTH, y + HEIGHT);
 60
 61
```

```
☑ RandomShapeGe...
☑ RandomShapeCo...
☒ ☑ RandomShapeVie...

☑ CircleDrawe

  2⊕ * Devante Wilson.
%12⊕ import java.awt.Color; ...
 16
17 public class RandomShapeComponent extends JComponent
 18 {
 19
        // draw the random shape
        public void paintComponent(Graphics g)
-20⊝
 21
 22
            // define objects
 23
            Graphics2D g2 = (Graphics2D) g;
 24
            RandomShapeGenerator rsg = new RandomShapeGenerator(getWidth(), getHeight());
 25
 26
            // call ten times
 27
            for (int i = 10; i > 0; i--)
 28
 29
                g2.draw(rsg.randomShape());
 30
31
        }
32 }
RandomShapeGe...
                RandomShapeCo...
                                 ☑ RandomShapeVie... 
☐ CircleDrawerC...
                                                                 10/**
 2 * Devante Wilson
 3 * November 21, 2015
 5 * Question 3
  6 4
  7
     * Generates random objects by
 8
     * implementing the Shape interface
 9
 10
 11 // import class
 12 import javax.swing.JFrame;
                                                                                Random shapes
                                                                                             _ _
14 public class RandomShapeViewer
                                                                                  \bigcirc
 15 {
 16⊖
        public static void main(String[] args)
 17
                                                                                  \bigcirc
 18
            // define objects
 19
            JFrame frame = new JFrame();
 20
            RandomShapeComponent component = new RandomShapeComponent();
 21
 22
            // set frame properties
                                                                                    23
            frame.setSize(300, 400);
 24
            frame.setTitle("Random shapes");
 25
            frame.setDefaultCloseOperation(JFrame.EXIT ON CLOSE);
 26
            frame.add(component);
 27
            frame.setVisible(true);
 28
        }
29 }
```

19/**

```
2 * Devante Wilson
 3 * November 21, 2015
 5
     * Question 4
  6
     * Program reads a file containing
 8 * two columns of floating-point numbers
 9
     * and prints average of each column
 10 */
 11
 12 // import classes
 13@ import java.io.File;
 14 import java.io.FileNotFoundException;
 15 import java.util.Scanner;
 16
 17 public class AverageColumns
 18 {
 19⊖
        public static void main(String[] args) throws FileNotFoundException
 20
 21
             // define new Scanner object
 22
            Scanner in = new Scanner(System.in);
 23
 24
            // prompt user for file name
 25
            System.out.print("Please enter the file name: ");
 26
            String filename = in.next();
 27
28
            // close Scanner object
 29
            in.close();
 30
 31
            // attempt to read from file
 32
            try
 33
            -{
 34
                File file = new File(filename);
 35
 36
                if (!file.exists())
 37
                    throw new FileNotFoundException();
 38
            1
 39
            catch (FileNotFoundException e)
 41
                System.err.println("Warning: " + e.getMessage());
 42
            3
 43
 44
            // define variables/objects
 45
            Scanner scan = new Scanner(new File(filename));
 46
            double sum1 = 0, sum2 = 0;
 47
            int count = 0;
 48
           String[] line;
 49
 50
            while (scan.hasNextDouble())
 51
 52
                // define array to hold columns
 53
                line = scan.nextLine().split("\\s+"); // one or more whitespaces
 54
               sum1 += Double.parseDouble(line[0]);
 55
                sum2 += Double.parseDouble(line[1]);
 56
                count = line.length;
 57
 58
 59
            // print average of column 1
 60
            System.out.println("Average of column 1: " + sum1 / count);
 61
 62
            // print average of column 2
 63
            System.out.println("Average of column 2: " + sum2 / count);
 64
 65
            // close Scanner object
 66
            scan.close();
 67
 68 }
 69
                                                                                                         testfile - Notepad
                                             File Edit Format View Help
<terminated> AverageColumns [Java Application] C:\Software\IBI
Please enter the file name: testfile
                                             1.5 2.5
Average of column 1: 6.0
                                             10.5 4.5
Average of column 2: 3.5
```

```
🚺 AverageColum... 🔬 MathGame.java 🛭 🗓 MathGameRunn...
                                                                    J) I
RandomShapeV...
   10/**
  2 * Devante Wilson
  3 * November 25, 2015
  5 * Question 5
   6 *
      * Program teaches arithmetic to a young child.
     * Testing only on addition and subtraction.
  9 * Generating random problems including 3 levels.
  10 *
  11 * Class creates the game.
  12 */
 13
  14 // import classes
  150 import java.util.Scanner;
  16 import java.util.InputMismatchException;
17 import java.util.Random;
  18
  19 public class MathGame
  20 {
  21
       // instance variables
  22 private Player player;
       private Scanner in;
  23
  24
        // constructor
  25
  260 public MathGame()
  27
       player = new Player();
in = -
  28
  29
            in = new Scanner(System.in);
  30
       }
  31
        // play the game
  32
  33⊖ public void play()
34 {
        readPlayerInformation();
String response = "";
  35
  36
  37
           boolean done = false;
  38
           while (!done)
  39
  40
            {
               playRound();
System.out.print("Do you want to play again? (Y/N) ");
  41
  42
  43
               response = in.next();
  44
  45
               if (!response.equalsIgnoreCase("y"))
  46
               {
  47
                     done = true;
  48
  49
             }
  50
```

```
☑ RandomShapeV...
☑ AverageColum...
☑ MathGame.java ⋈
☑ MathGameRunn...
                                                                              Player.java
          // read user information
          public void readPlayerInformation()
  54
               String name = "";
  55
              System.out.print("What is your name? ");
  56
             name = in.next();
int initialLevel = 0;
  57
  58
             boolean done = false;
  59
  60
  61
              while (!done)
  62
                   System.out.print("At what level do you want to start? (1-3) ");
  63
  64
  65
                   try
  66
  67
                       initialLevel = in.nextInt();
  68
  69
                        if (initialLevel >= 1 && initialLevel <= 3)
  70
                            done = true;
  73
                   catch (InputMismatchException e)
  75
                   {
  76
                        in.next(); // read the newline character
  77
                        System.out.println("Plese, enter a number between a 1 and 3.");
  78
  79
             }
  80
              player = new Player(name, initialLevel);
  81
  82
  83
🗓 RandomShapeV... 🗓 AverageColum... 🔊 MathGame.java 🛭 🚺 MathGameRunn.
  84 // play one round of the game
85⊖ public void playRound()
  86
           int i2 = 0;
int answer = 0;
           Random generator = new Random();
            if (player.getLevel() == 1)
               boolean done = false;
                while (!done)
                i2 = generator.nextInt(9) + 1;
                   answer = i1 + i2;
 101
102
 105
106
               }
                System.out.print("What is " + i1 + " + " + i2 + " ? ");
 109
110
             else if (player.getLevel() == 2)
 111
112
                i1 = generator.nextInt(9) + 1;
 113
114
                i2 = generator.nextInt(9) + 1;
answer = i1 + i2;
                System.out.print("What is " + i1 + " + " + i2 + " ? ");
 115
116
            if (player.getLevel() == 3)
               boolean done = false;
 122
123
                while (!done)
               124
125
                   i2 = generator.nextInt(9) + 1;
 126
127
                  answer = i2 - i1;
128
129
                  if (answer > 0)
 130
131
                       done = true;
134
135
136
137
               System.out.print("What is " + i2 + " - " + i1 + " ? ");
            System.out.println(getResults(answer));
```

```
☑ RandomShapeV...
☑ AverageColum...
☑ MathGame.java
☒ ☑ MathGameRunn...
☑ Player.java
☑ GraphData.java
1400
         * get results of the play.
141
         * @param answer the answer
142
         * @return the results
143
 144
 145⊖
        public String getResults(int answer)
 146
 147
            int guess = getGuess();
 148
            if (answer != guess) //Allow a second try.
 149
 150
 151
                System.out .println("Sorry, that is incorrect. Please try one more time.");
 152
                guess = getGuess();
 153
 154
 155
            String result = "";
 156
 157
            if (answer == quess)
 158
                result = "Congratulations, " + player.getName() + "! That is correct.";
 159
 160
                player.incrementScore();
 161
 162
 163
            {
 164
                result = "Sorry, " + player.getName() +
                       ". The correct answer is " + answer;
 165
166
            }
167
 168
            return result:
169
🗓 RandomShapeV... 📗 AverageColum... 🖟 MathGame.java 🖾 📝 MathGameRunn... 🖟 Player.java 🖟 GraphData.ja
 170
171⊜
172
          * get the guess from the player
          * Oparam the guess from the player.
173
174
 175⊜
          public int getGuess()
176
177
              int guess = 0;
178
              boolean done = false;
179
              String input = "";
180
181
              while (!done)
182
              {
183
                   try
184
                   {
                        if (player.getLevel() == 3)
 185
 186
                            System.out.print("Please enter the difference: ");
 187
 188
                            guess = in.nextInt();
 189
 190
                       else
 191
                        {
192
                            System.out.print("Please enter the sum: ");
 193
                            guess = in.nextInt();
 194
                       }
 195
 196
                       if (quess > 0)
 197
 198
                            done = true;
 199
200
                   }
 201
                   catch (InputMismatchException e)
 202
                        in.next(); // read the newline character
 203
                       System.out.println("The response must be a number.");
 204
 205
 206
              }
 207
208
              return guess;
209
210 }
```

```
11 public class Player
12 {
13  // instance variables
14
     private String name;
15 private int score;
     private int level;
16
17
18
     // constructor
199 public Player()
20
     {
     name = "";
score = 0;
level = *
21
22
23
     }
24
25
26⊖
     /* construct a Player object
27
      * with the player's name and initial level.
28
       * @param playerName the player's name
29
       * @param initialLevel the initial level
30
31⊖
     public Player(String playerName, int initialLevel)
32
     {
33
         name = playerName;
34
          score = 0;
35
          level = initialLevel;
36
     }
37
38
     // increment the player's score.
39@ public void incrementScore()
40
      {
41
         score++;
42
      if (score % 5 == 0 && level < 3)
43
44
         {
45
              level++;
46
         }
47
     }
48
49⊝
     /* get the current level.
50
      * @return level the current level
51
52⊖
     public int getLevel()
53
54
      return level;
55
     }
56
57⊖
58
      * get the name of the player.
59
       * @return name the name of the player;
60
61⊖
     public String getName()
62
     -{
63
          return name;
64
      }
65 }
```

```
10 /**
    * Devante Wilson
     * November 25, 2015
 3
 4
 5
    * Question 5
 6
 7
    * This class runs the math game.
 8
 9
10 public class MathGameRunner
11 {
120
       public static void main(String[] args)
13
14
           MathGame game = new MathGame();
15
           game.play();
16
       }
17 }
```

```
C:\Users\100554361\Documents\0bject Oriented Programming and Design\Eclipse Work space\00P - Assignment 4 - Question 5\src\java -jar gameSeal.jar
What is your name? Devante
At what level do you want to start? (1-3) 1
What is 6 + 1 ? Please enter the sum: 7
Congratulations, Devante! That is correct.
Do you want to play again? (Y/N) y
What is 1 + 2 ? Please enter the sum: 3
Congratulations, Devante! That is correct.
Do you want to play again? (Y/N) y
What is 4 + 2 ? Please enter the sum: 0
Please enter the sum: 1
Sorry, that is incorrect. Please try one more time.
Please enter the sum: 3
Sorry, Devante. The correct answer is 6
Do you want to play again? (Y/N) n
```

```
Manfiest.txt - Notepad

File Edit Format View Help

Main-Class: MathGameRunner
```