

```

Beverages.java x Tea.java Coffee.java BeverageTest.java
1 package beverages; // Adjust the package name accordingly
2
3 abstract class Beverages { no usages 2 inheritors
4     private boolean wantsExtras; 2 usages
5
6     public final void finalTemplateMethod() {...}
7
8     public void setWantsExtras(boolean wantsExtras) { no usages
9         this.wantsExtras = wantsExtras;
10    }
11
12    public void boilWater() { 1 usage
13        System.out.println("Boiling water");
14    }
15
16    public void pourInCup() { 1 usage
17        System.out.println("Pouring into cup");
18    }
19
20    abstract void brew(); 1 usage 2 implementations
21
22    abstract void addCondiments(); 1 usage 2 implementations
23
24    abstract void addExtras(); 1 usage 2 implementations
25 }
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```

```
☿ Beverages.java  ☿ Tea.java  ☿ Coffee.java ×  ☿ BeverageTest.java

1 package beverages;
2
3 class Coffee extends Beverages { 2 usages
4
5     @Override 1 usage
6     void brew() {
7         System.out.println("Dripping coffee through filter");
8     }
9
10    @Override 1 usage
11    void addCondiments() {
12        System.out.println("Adding sugar and milk");
13    }
14
15    @Override 1 usage
16    void addExtras() {
17        System.out.println("Adding vanilla syrup");
18    }
19 }
20
```

```
☿ Beverages.java  ☿ Tea.java  ☿ Coffee.java  ☿ BeverageTest.java ×

1 package beverages;
2
3 import java.util.Scanner;
4
5 public class BeverageTest {
6     public static void main(String[] args) {
7         Scanner scanner = new Scanner(System.in);
8
9         Tea tea = new Tea();
10        Coffee coffee = new Coffee();
11
12        System.out.print("Do you want extras with your tea (yes/no)? ");
13        String teaExtras = scanner.nextLine().trim().toLowerCase();
14        tea.setWantsExtras(teaExtras.equals("yes"));
15
16        System.out.print("Do you want extras with your coffee (yes/no)? ");
17        String coffeeExtras = scanner.nextLine().trim().toLowerCase();
18        coffee.setWantsExtras(coffeeExtras.equals("yes"));
19
20        System.out.println("\nMaking tea...");
21        tea.finalTemplateMethod();
22
23        System.out.println("\nMaking coffee...");
24        coffee.finalTemplateMethod();
25
26        scanner.close();
27    }
28 }
29
```



```
1 package shapes;
2
3 public class Square implements Shape { 1 usage
4     @Override 4 usages
5     public void draw() {
6         System.out.println("Square:");
7         for (int i = 0; i < 5; i++) {
8             for (int j = 0; j < 5; j++) {
9                 System.out.print("* ");
10            }
11            System.out.println();
12        }
13    }
14 }
```

```
1 package shapes;
2
3 public class Circle implements Shape { 1 usage
4     @Override 4 usages
5     public void draw() {
6         System.out.println("Circle:");
7         int radius = 6; // Adjust radius to match the desired size
8
9         // Iterate over each row
10        for (int i = 0; i <= 2 * radius; i++) {
11            // Iterate over each column
12            for (int j = 0; j <= 2 * radius; j++) {
13                // Calculate the distance from the center of the circle
14                double distance = Math.sqrt((i - radius) * (i - radius) + (j - radius) * (j - radius));
15
16                // If the distance is less than or equal to the radius, print a star
17                if (distance > radius - 0.5 && distance < radius + 0.5) {
18                    System.out.print("* ");
19                } else {
20                    System.out.print(" ");
21                }
22            }
23            System.out.println();
24        }
25    }
26 }
```

```
Shape.java Square.java Circle.java Rectangle.java x Triangle.java ShapeFactory.java ShapeTest.java
1 package shapes;
2
3 public class Rectangle implements Shape { 1 usage
4     @Override 4 usages
5     public void draw() {
6         System.out.println("Rectangle:");
7         for (int i = 0; i < 4; i++) {
8             for (int j = 0; j < 6; j++) {
9                 System.out.print("* ");
10            }
11            System.out.println();
12        }
13    }
14 }
```

```
Shape.java Square.java Circle.java Rectangle.java Triangle.java x ShapeFactory.java ShapeTest.java
1 package shapes;
2
3 public class Triangle implements Shape { 1 usage
4     @Override 4 usages
5     public void draw() {
6         System.out.println("Triangle:");
7         int rows = 5; // Example number of rows for triangle
8         for (int i = 1; i <= rows; i++) {
9             for (int j = rows; j > i; j--) {
10                 System.out.print(" ");
11            }
12            for (int k = 1; k <= (2 * i - 1); k++) {
13                System.out.print("*");
14            }
15            System.out.println();
16        }
17    }
18 }
```

```
Shape.java  Square.java  Circle.java  Rectangle.java  Triangle.java  ShapeFactory.java  ShapeTest.java
1 package shapes;
2
3 public class ShapeFactory { 2 usages
4     // Use getShape method to get the object of the shape type
5     public Shape getShape(String shapeType) { 4 usages
6         if (shapeType == null) {
7             return null;
8         }
9         if (shapeType.equalsIgnoreCase("SQUARE")) {
10            return new Square();
11        } else if (shapeType.equalsIgnoreCase("CIRCLE")) {
12            return new Circle();
13        } else if (shapeType.equalsIgnoreCase("RECTANGLE")) {
14            return new Rectangle();
15        } else if (shapeType.equalsIgnoreCase("TRIANGLE")) {
16            return new shapes.Triangle();
17        } else {
18            System.out.println("Invalid shape type provided.");
19            return null;
20        }
21    }
22 }
```

```
Shape.java  Square.java  Circle.java  Rectangle.java  Triangle.java  ShapeFactory.java  ShapeTest.java
1 package shapes;
2
3 public class ShapeTest {
4     public static void main(String[] args) {
5         ShapeFactory shapeFactory = new ShapeFactory();
6
7         // Create and draw a Square
8         Shape shape1 = shapeFactory.getShape("SQUARE");
9         if (shape1 != null) shape1.draw();
10
11        // Create and draw a Circle
12        Shape shape2 = shapeFactory.getShape("CIRCLE");
13        if (shape2 != null) shape2.draw();
14
15        // Create and draw a Rectangle
16        Shape shape3 = shapeFactory.getShape("RECTANGLE");
17        if (shape3 != null) shape3.draw();
18
19        // Create a shape that is invalid
20        Shape shape4 = shapeFactory.getShape("INVALID_SHAPE");
21        if (shape4 != null) shape4.draw();
22    }
23 }
24
```

```
LightOnCommand.java x LightOffCommand.java LightDimCommand.java RemoteControl.java KitchenRoomLight.java Command.java Light.java LivingRoomLight.java Test.java
1 package lightcontrol;
2
3 import lightcontrol.Command;
4
5 public class LightOnCommand implements Command { 2 usages
6     private Light light; 3 usages
7
8     > public LightOnCommand(Light light) { this.light = light; }
9
10    @Override 1 usage
11    public void execute() { light.on(); }
12
13    @Override 1 usage
14    public void undo() { light.off(); }
15 }
16
17
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25

LightOnCommand.java LightOffCommand.java x LightDimCommand.java RemoteControl.java KitchenRoomLight.java Command.java Light.java LivingRoomLight.java Test.java
1 package lightcontrol;
2
3 public class LightOffCommand implements Command { 2 usages
4     private Light light; 3 usages
5
6     > public LightOffCommand(Light light) { this.light = light; }
7
8
9
10    @Override 1 usage
11    public void execute() { light.off(); }
12
13
14
15    @Override 1 usage
16    public void undo() { light.on(); }
17 }
18
19
20
21
22
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24
25

LightOnCommand.java LightOffCommand.java LightDimCommand.java x RemoteControl.java KitchenRoomLight.java Command.java Light.java LivingRoomLight.java Test.java
1 package lightcontrol;
2
3 public class LightDimCommand implements Command { 4 usages
4     private Light light; 4 usages
5     private int previousBrightness; 2 usages
6     private int newBrightness; 2 usages
7
8     public LightDimCommand(Light light, int newBrightness) { 4 usages
9         this.light = light;
10        this.newBrightness = newBrightness;
11    }
12
13    @Override 1 usage
14    public void execute() {
15        previousBrightness = light.getBrightness();
16        light.dim(newBrightness);
17    }
18
19    @Override 1 usage
20    public void undo() { light.dim(previousBrightness); }
21 }
22
23
24
25
```

```
LightOnCommand.java  LightOffCommand.java  LightDimCommand.java  RemoteControl.java  KitchenRoomLight.java  Command.java  Light.java  LivingRoomLight.java  Test.java

1 package lightcontrol;
2
3 public class RemoteControl { 2 usages
4     private Command[] commands; 5 usages
5     private Command lastCommand; 3 usages
6
7     public RemoteControl(int numSlots) { commands = new Command[numSlots]; }
8
9
10
11     public void setCommand(int slot, Command command) { commands[slot] = command; }
12
13
14
15     public void pressButton(int slot) { 10 usages
16         if (commands[slot] != null) {
17             commands[slot].execute();
18             lastCommand = commands[slot];
19         }
20     }
21
22     public void pressUndo() { no usages
23         if (lastCommand != null) {
24             lastCommand.undo();
25         } else {
26             System.out.println("No command to undo");
27         }
28     }
29 }
30
31
32

LightOnCommand.java  LightOffCommand.java  LightDimCommand.java  RemoteControl.java  KitchenRoomLight.java  Command.java  Light.java  LivingRoomLight.java  Test.java

1 package lightcontrol;
2
3 public class KitchenRoomLight implements Light { 1 usage
4     private int brightness = 100; // Default full brightness 3 usages
5
6     @Override 2 usages
7     public void on() {
8         brightness = 100;
9         System.out.println("Kitchen room light is ON at full brightness");
10    }
11
12    @Override 2 usages
13    public void off() { System.out.println("Kitchen room light is OFF"); }
14
15
16
17    @Override 2 usages
18    public void dim(int level) {
19        this.brightness = level;
20        System.out.println("Kitchen room light dimmed to " + level + "% brightness");
21    }
22
23    @Override 1 usage
24    public int getBrightness() { return brightness; }
25 }
26
27
28
29

LightOnCommand.java  LightOffCommand.java  LightDimCommand.java  RemoteControl.java  KitchenRoomLight.java  Command.java  Light.java  LivingRoomLight.java  Test.java

1 package lightcontrol;
2
3 public interface Command { 16 usages 3 implementations
4     void execute(); 1 usage 3 implementations
5     void undo(); 1 usage 3 implementations
6 }
7
```

LightOnCommand.javaLightOffCommand.javaLightDimCommand.javaRemoteControl.javaKitchenRoomLight.javaCommand.javaLight.javaLivingRoomLight.javaTest.java

1package lightcontrol;
2
301 public interface Light { 10 usages 2 implementations
401 void on(); 2 usages 2 implementations
501 void off(); 2 usages 2 implementations
601 void dim(int level); 2 usages 2 implementations
701 int getBrightness(); 1 usage 2 implementations
8
9
10
11

LightOnCommand.javaLightOffCommand.javaLightDimCommand.javaRemoteControl.javaKitchenRoomLight.javaCommand.javaLight.javaLivingRoomLight.javaTest.java

1package lightcontrol;
2
3 public class LivingRoomLight implements Light { 1 usage
4 private int brightness = 100; // Default full brightness 3 usages
5
6
701 @Override 2 usages
8 public void on() {
9 brightness = 100;
10 System.out.println("Living room light is ON at full brightness");
11 }
12
1301 @Override 2 usages
14 public void off() { System.out.println("Living room light is OFF"); }
15
16
1701 @Override 2 usages
18 public void dim(int level) {
19 this.brightness = level;
20 System.out.println("Living room light dimmed to " + level + "% brightness");
21 }
22
23
2401 @Override 1 usage
25 public int getBrightness() { return brightness; }
26
27
28
29
30