One real-life example of a behavioral design pattern is the Observer pattern. It is widely used in event-driven systems and user interface frameworks.

Consider the scenario of a weather monitoring application where multiple displays need to be updated whenever the weather conditions change. The Observer pattern can be applied to achieve this functionality.

Here's how the Observer pattern can be used in this scenario:

Define the Subject interface: Create an interface called Subject that declares the methods for registering, removing, and notifying observers. java Copy code public interface Subject { void registerObserver(Observer observer); void removeObserver(Observer observer); void notifyObservers(); } Save to grepper Implement the Subject: Create a class that implements the Subject interface. This class will maintain a list of observers and notify them when a change occurs. java Copy code import java.util.ArrayList; import java.util.List;

public class WeatherData implements Subject { private List<Observer> observers; private float temperature; private float humidity; private float pressure;

```
public WeatherData() {
    observers = new ArrayList<>();
}
```

```
@Override
public void registerObserver(Observer observer) {
    observers.add(observer);
}
```

```
@Override
public void removeObserver(Observer observer) {
    observers.remove(observer);
}
```

```
@Override
public void notifyObservers() {
    for (Observer observer : observers) {
        observer.update(temperature, humidity, pressure);
    }
}
```

```
    // Other methods to update the weather data and trigger notifications
    public void setMeasurements(float temperature, float humidity, float pressure) {
        this.temperature = temperature;
        this.humidity = humidity;
        this.pressure = pressure;
```

```
        notifyObservers();
    }
}
Save to grepper
Define the Observer interface: Create an interface called Observer that declares the
method for receiving updates.
java
Copy code
public interface Observer {
    void update(float temperature, float humidity, float pressure);
}
Save to grepper
Implement the Observers: Create classes that implement the Observer interface. These
classes will define the behavior to be executed when they receive updates.
java
Copy code
public class CurrentConditionsDisplay implements Observer {
    private float temperature;
    private float humidity;
```

```
@Override
public void update(float temperature, float humidity, float pressure) {
    this.temperature = temperature;
    this.humidity = humidity;
    display();
}
```

```
    public void display() {
        System.out.println("Current conditions: " + temperature + "F degrees and " +
humidity + "% humidity");
    }
}
```

public class ForecastDisplay implements Observer { private float pressure;

```
@Override
public void update(float temperature, float humidity, float pressure) {
    this.pressure = pressure;
    display();
}
```

```
    public void display() {
        System.out.println("Weather forecast: Pressure is " + pressure);
    }
}
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```

```
Use the Observer pattern: In the client code, create instances of the subject and
observers. Register the observers with the subject, and then update the subject with
new weather data.
java
Copy code
public class Client {
    public static void main(String[] args) {
        WeatherData weatherData = new WeatherData();
```

```
CurrentConditionsDisplay conditionsDisplay = new CurrentConditionsDisplay();
ForecastDisplay forecastDisplay = new ForecastDisplay();
```

```
weatherData.registerObserver(conditionsDisplay);
weatherData.registerObserver(forecastDisplay);
```

```
weatherData.setMeasurements(75, 60, 30.4f);
```

```
        // Output:
        // Current conditions: 75F degrees and 60% humidity
        // Weather forecast: Pressure is 30.4
    }
}
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In this example, the WeatherData class acts as the subject that maintains a list of
observers (CurrentConditionsDisplay and ForecastDisplay). When the weather data is
updated using the setMeasurements method, the subject notifies all registered
observers by calling their update method. Each observer can then update its display or
perform any other behavior based on the received data.
```

The Observer pattern provides loose coupling between the subject and observers, as the observers are only dependent on the subject's interface. It allows for dynamic addition and removal of observers and enables multiple objects to react to changes in a subject independently.

This real-life example demonstrates how the Observer pattern can be used to implement event notification systems, such as weather monitoring, stock market updates, and user interface frameworks, where multiple components need to react to changes in a central entity or system.