**Exercise 3 resilience**

**Project structure:**

gateway-resilience/

├── pom.xml

├── src/

│ └── main/

│ ├── java/

│ │ └── com/

│ │ └── edge/

│ │ └── gateway/

│ │ ├── GatewayResilienceApplication.java

│ │ ├── ResilienceConfiguration.java

│ │ └── GatewayApplication.java

│ └── resources/

│ └── application.properties

**GatewayApplication.java**

package com.edge.gateway;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class GatewayApplication {

    public static void main(String[] args) {

        SpringApplication.run(GatewayApplication.class, args);

    }

}

**GatewayResilianceApplication.java**

package com.edge.gateway;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class GatewayResilienceApplication {

    public static void main(String[] args) {

        SpringApplication.run(GatewayResilienceApplication.class, args);

    }

}

**ResilianceConfiguration.java**

package com.edge.gateway;

import io.github.resilience4j.circuitbreaker.CircuitBreakerConfig;

import io.github.resilience4j.timelimiter.TimeLimiterConfig;

import org.springframework.cloud.circuitbreaker.resilience4j.ReactiveResilience4JCircuitBreakerFactory;

import org.springframework.cloud.circuitbreaker.resilience4j.Resilience4JConfigBuilder;

import org.springframework.context.annotation.Bean;

import org.springframework.context.annotation.Configuration;

import org.springframework.cloud.client.circuitbreaker.Customizer;

import java.time.Duration;

@Configuration

public class ResilienceConfiguration {

    @Bean

    public Customizer<ReactiveResilience4JCircuitBreakerFactory> defaultCustomizer() {

        return factory -> factory.configureDefault(id -> new Resilience4JConfigBuilder(id)

                .circuitBreakerConfig(CircuitBreakerConfig.custom()

                        .failureRateThreshold(50)

                        .slidingWindowSize(10)

                        .build())

                .timeLimiterConfig(TimeLimiterConfig.custom()

                        .timeoutDuration(Duration.ofSeconds(4))

                        .build())

                .build());

    }

}

**Application.properties**

spring.cloud.gateway.routes[0].id=resilient\_route

spring.cloud.gateway.routes[0].uri=http://localhost:8081/fallback

spring.cloud.gateway.routes[0].predicates[0]=Path=/resilient/\*\*

spring.cloud.gateway.routes[0].filters[0]=CircuitBreaker=name=exampleCircuitBreaker,fallbackUri=/fallback

# Resilience4j CircuitBreaker config

resilience4j.circuitbreaker.instances.exampleCircuitBreaker.registerHealthIndicator=true

resilience4j.circuitbreaker.instances.exampleCircuitBreaker.slidingWindowSize=10

resilience4j.circuitbreaker.instances.exampleCircuitBreaker.failureRateThreshold=50

**pom.xml**

<project xmlns="http://maven.apache.org/POM/4.0.0"

         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 https://maven.apache.org/xsd/maven-4.0.0.xsd">

    <modelVersion>4.0.0</modelVersion>

    <groupId>com.edge.gateway</groupId>

    <artifactId>gateway-resilience</artifactId>

    <version>0.0.1-SNAPSHOT</version>

    <name>gateway-resilience</name>

    <description>Spring Cloud Gateway with Resilience4j</description>

    <packaging>jar</packaging>

    <parent>

        <groupId>org.springframework.boot</groupId>

        <artifactId>spring-boot-starter-parent</artifactId>

        <version>3.1.5</version>

        <relativePath/> <!-- lookup parent from repository -->

    </parent>

    <properties>

        <java.version>17</java.version>

        <spring-cloud.version>2022.0.5</spring-cloud.version>

    </properties>

    <dependencies>

        <!-- Spring WebFlux -->

        <dependency>

            <groupId>org.springframework.boot</groupId>

            <artifactId>spring-boot-starter-webflux</artifactId>

        </dependency>

        <!-- Spring Cloud Gateway -->

        <dependency>

            <groupId>org.springframework.cloud</groupId>

            <artifactId>spring-cloud-starter-gateway</artifactId>

        </dependency>

        <!-- Resilience4j integration with Spring Cloud CircuitBreaker -->

        <dependency>

            <groupId>org.springframework.cloud</groupId>

            <artifactId>spring-cloud-starter-circuitbreaker-reactor-resilience4j</artifactId>

        </dependency>

        <!-- Optional: For actuator health monitoring -->

        <dependency>

            <groupId>org.springframework.boot</groupId>

            <artifactId>spring-boot-starter-actuator</artifactId>

        </dependency>

        <!-- Optional: For testing -->

        <dependency>

            <groupId>org.springframework.boot</groupId>

            <artifactId>spring-boot-starter-test</artifactId>

            <scope>test</scope>

            <exclusions>

                <exclusion>

                    <groupId>org.junit.vintage</groupId>

                    <artifactId>junit-vintage-engine</artifactId>

                </exclusion>

            </exclusions>

        </dependency>

    </dependencies>

    <dependencyManagement>

        <dependencies>

            <dependency>

                <groupId>org.springframework.cloud</groupId>

                <artifactId>spring-cloud-dependencies</artifactId>

                <version>${spring-cloud.version}</version>

                <type>pom</type>

                <scope>import</scope>

            </dependency>

        </dependencies>

    </dependencyManagement>

    <build>

    <plugins>

        <plugin>

            <groupId>org.springframework.boot</groupId>

            <artifactId>spring-boot-maven-plugin</artifactId>

            <configuration>

                <mainClass>com.edge.gateway.GatewayResilienceApplication</mainClass>

            </configuration>

        </plugin>

    </plugins>

</build>

</project>

**Output:**

