**Lab Exercise 23- Activation Group in Drools**

**Objective:**

To create a Drools project demonstrating how to use an activation-group to control the firing of mutually exclusive rules. When rules belong to the same activation group, only one of them can be activated and executed.

**Prerequisites:**

* Basic knowledge of Drools and Java.
* A development environment with Drools and Java set up.

**Exercise Steps:**

**Step 1: Create the Project Structure**

1. **Create a Java Maven Project:**
   * Create a Maven project with the following structure:

**Step 2: Define the Model Class**

1. **Create the Person class:**

package com.example.model;

public class Person {

private String name;

private int age;

public Person(String name, int age) {

this.name = name;

this.age = age;

}

public String getName() {

return name;

}

public int getAge() {

return age;

}

}

**Step 3: Define the Rule File Using Activation Group**

1. **Create the DiscountRules.drl file:**

package com.example.rules;

import com.example.model.Person;

global java.util.List resultList;

// Rule for senior citizen discount

rule "Senior Citizen Discount"

activation-group "discount-group" // Part of an activation group

when

$person : Person(age > 60)

then

resultList.add($person.getName() + " gets Senior Citizen Discount.");

end

// Rule for adult discount

rule "Adult Discount"

activation-group "discount-group" // Part of an activation group

when

$person : Person(age >= 18 && age <= 60)

then

resultList.add($person.getName() + " gets Adult Discount.");

end

// Rule for child discount

rule "Child Discount"

activation-group "discount-group" // Part of an activation group

when

$person : Person(age < 18)

then

resultList.add($person.getName() + " gets Child Discount.");

end

**Step 4: Configure Drools**

1. **Create the kmodule.xml file:**

<?xml version="1.0" encoding="UTF-8"?>

<kmodule xmlns="http://www.drools.org/xsd/kmodule">

<kbase name="rules" packages="com.example.rules">

<ksession name="ksession-rules"/>

</kbase>

</kmodule>

**Step 5: Write the Main Class**

1. **Create a Main class to execute the rules:**

package com.example;

import com.example.model.Person;

import org.kie.api.KieServices;

import org.kie.api.runtime.KieContainer;

import org.kie.api.runtime.KieSession;

import java.util.ArrayList;

import java.util.List;

public class DroolsActivationGroupExample {

public static void main(String[] args) {

try {

KieServices ks = KieServices.Factory.get();

KieContainer kContainer = ks.getKieClasspathContainer();

KieSession kSession = kContainer.newKieSession("ksession-rules");

List<String> resultList = new ArrayList<>();

kSession.setGlobal("resultList", resultList);

// Insert Person objects

Person john = new Person("John", 65); // Senior citizen

Person mary = new Person("Mary", 30); // Adult

Person tommy = new Person("Tommy", 12); // Child

kSession.insert(john);

kSession.insert(mary);

kSession.insert(tommy);

kSession.fireAllRules();

for (String result : resultList) {

System.out.println(result);

}

kSession.dispose();

} catch (Throwable t) {

t.printStackTrace();

}

}

}

**Step 6: Run the Project**

* Run the DroolsActivationGroupExample class to see how the activation group works.

**Expected Output:**

John gets Senior Citizen Discount.

**Explanation:**

* **Activation Group:**
  + The three rules (Senior Citizen Discount, Adult Discount, and Child Discount) are grouped together under the activation group "discount-group".
  + When one of the rules in the group is activated and fired, the other rules in the same group are prevented from firing, even if their conditions are met.
* In this case, since John qualifies for the senior citizen discount, that rule is activated and fired, and the other rules in the group are deactivated. Even though the other people qualify for discounts (based on age), only one rule fires because they are all part of the same activation group.

**Customizing the Example:**

* You can experiment by changing the ages of the Person objects to observe how different rules in the activation group get fired based on the conditions.