Red Hat Decision Manager 7.0

Getting started with decision services

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Red Hat Decision Manager 7.0 Getting started with decision services

Red Hat Customer Content Services
brms-docs@redhat.com

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Abstract

In this tutorial, you will create and test a driver's license suspension scenario.

Table of Contents

PREFACE

As a business analyst or rules developer, you can use Decision Central in Red Hat Decision Manager to design a variety of decision services. In this tutorial, you will create and test a driver's license suspension scenario.

Prerequisites

- Installed Red Hat JBoss Enterprise Application Platform 7.1.0. See *Red Hat JBoss EAP 7.1.0 Installation Guide*.
- Installed Red Hat Decision Manager. For more information, see the Installing Red Hat Decision Manager on premise.
- Red Hat Decision Manager is running and you can log in to Decision Central with the **`admin`** role. For more information, see the Installing Red Hat Decision Manager on premise.

CHAPTER 1. CREATING THE TRAFFIC VIOLATIONS PROJECT

A project is the container for assets, such as data objects, guided decision tables, and guided rules. In this chapter, you will create the **Driver department traffic violations** project.

Procedure

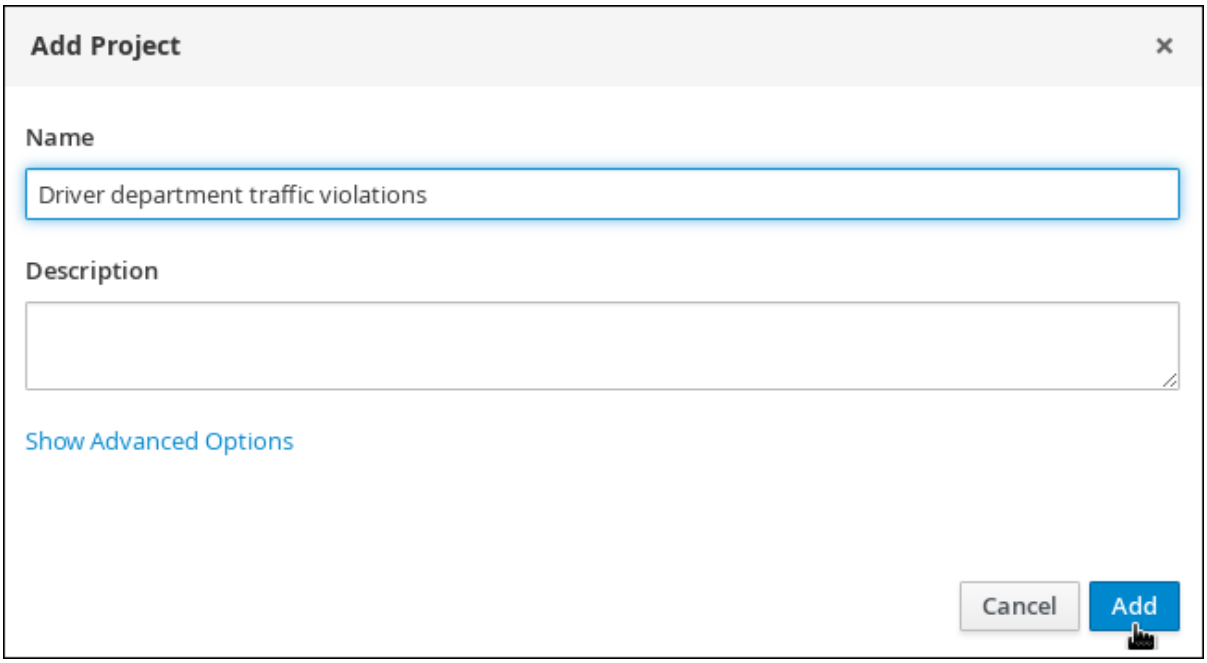
1. Log in to Decision Central.
2. Go to **Menu** → **Design** → **Projects**.
   Tip: Red Hat Decision Manager provides a default space called **myteam**, as shown in the following image. You can use the default space to create and test example projects.

   Figure 1.1. Default spaces

3. Click **Add Project**.
4. Enter **`Driver department traffic violations`** in the **Name** field.
5. Click **Add**.

   Figure 1.2. Add Project window

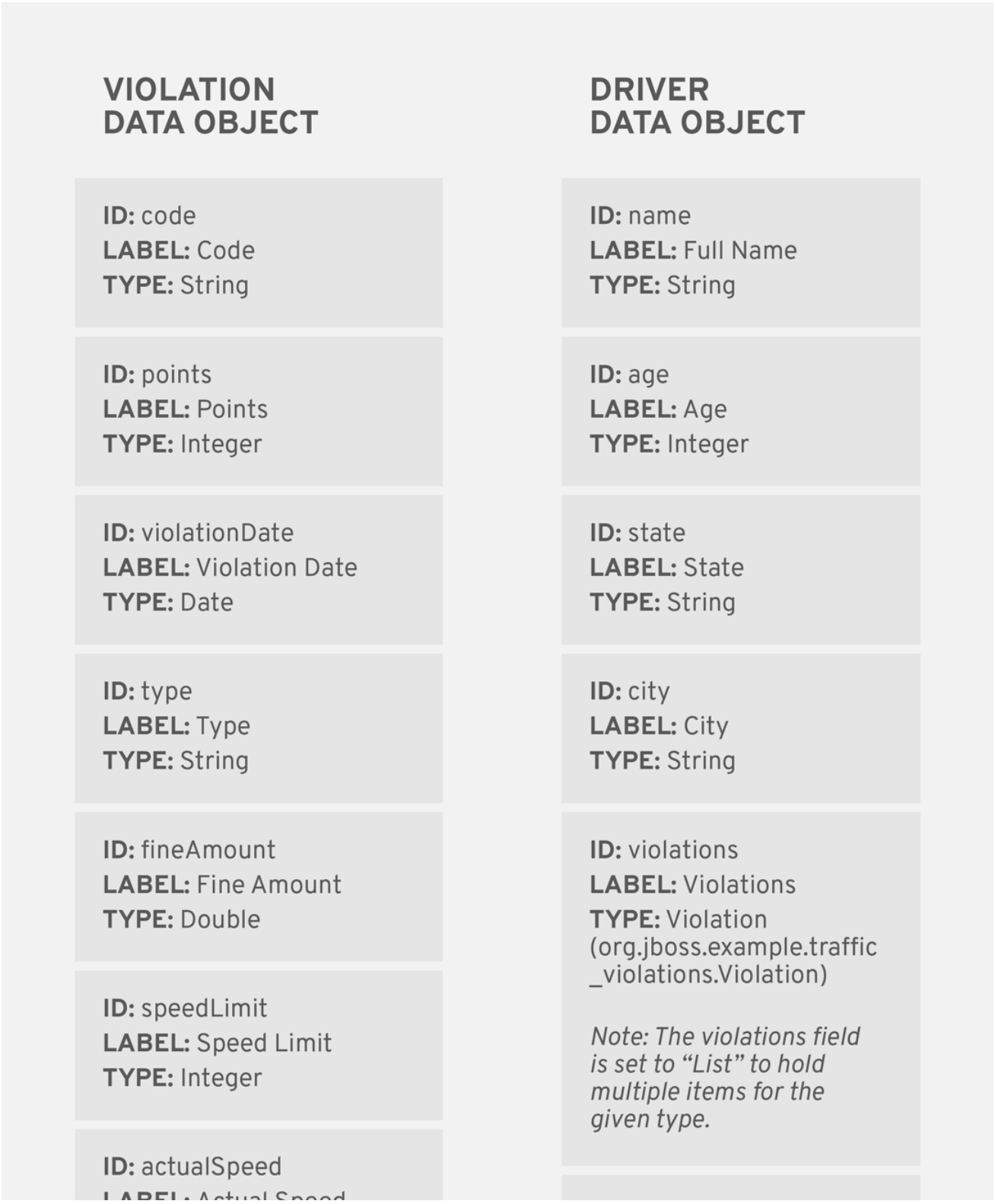
   

CHAPTER 2. DATA OBJECTS

Data objects are the building blocks for the rule assets that you create. Data objects are custom data types implemented as Java objects in specified packages of your project. For example, you might create a **`Person`** object with data fields **`Name`**, **`Address`**, and **`Date of Birth`** to specify personal details for loan application rules. These custom data types determine what data your assets and your decision service are based on.

The following illustration shows the **`Violation`** and **`Driver`** data objects that you will create in this tutorial.

Figure 2.1. Driver department traffic violations data objects



2.1. CREATING THE VIOLATION DATA OBJECT

The **`Violation`** data object contains data fields based on violation details, such as **`Violation Date`**, **`Fine Amount`**, and **`Speed Limit`**.

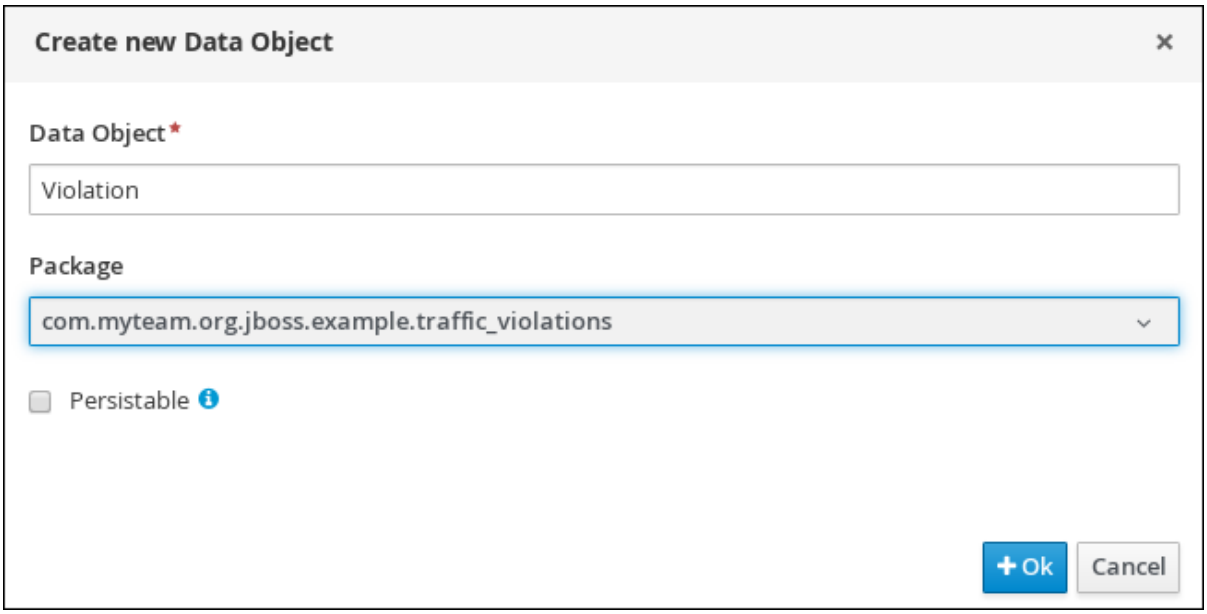
Prerequisites

You have created the **`Driver department traffic violations`** project.

Procedure

1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Create New Asset** → **Data Object**.
3. In the **Create new Data Object** wizard, enter the following values:
   - **Data Object**: **`Violation`**.
   - **Package**: select **`com.myteam.driverdepartmenttrafficviolations`**.
4. Click **Ok**.

Figure 2.2. Create new Data Object window



2.1.1. Adding the Violation data object data fields

Prerequisites

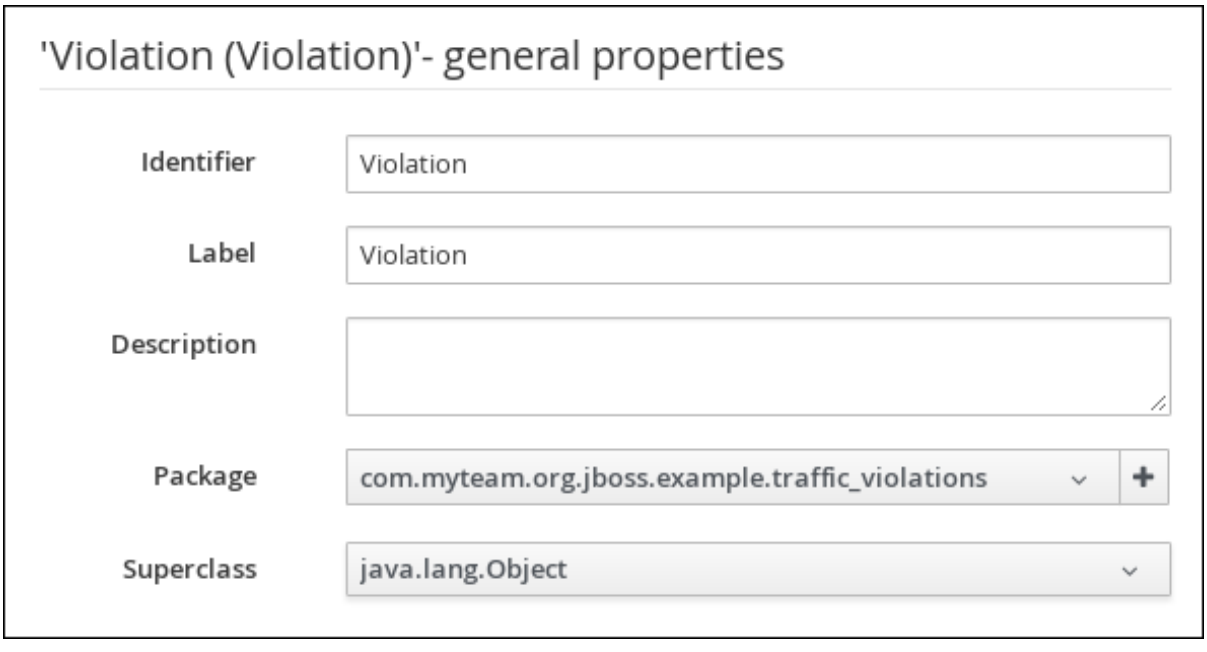
You have created the **`Violation`** data object.

Procedure

The data fields in the **`Violation`** data object define the available constraints that you can select from when you define your violation rules later.

1. In the **`Violation-general properties`** section, locate the **Label** property and enter: **Violation**.

Figure 2.3. General properties



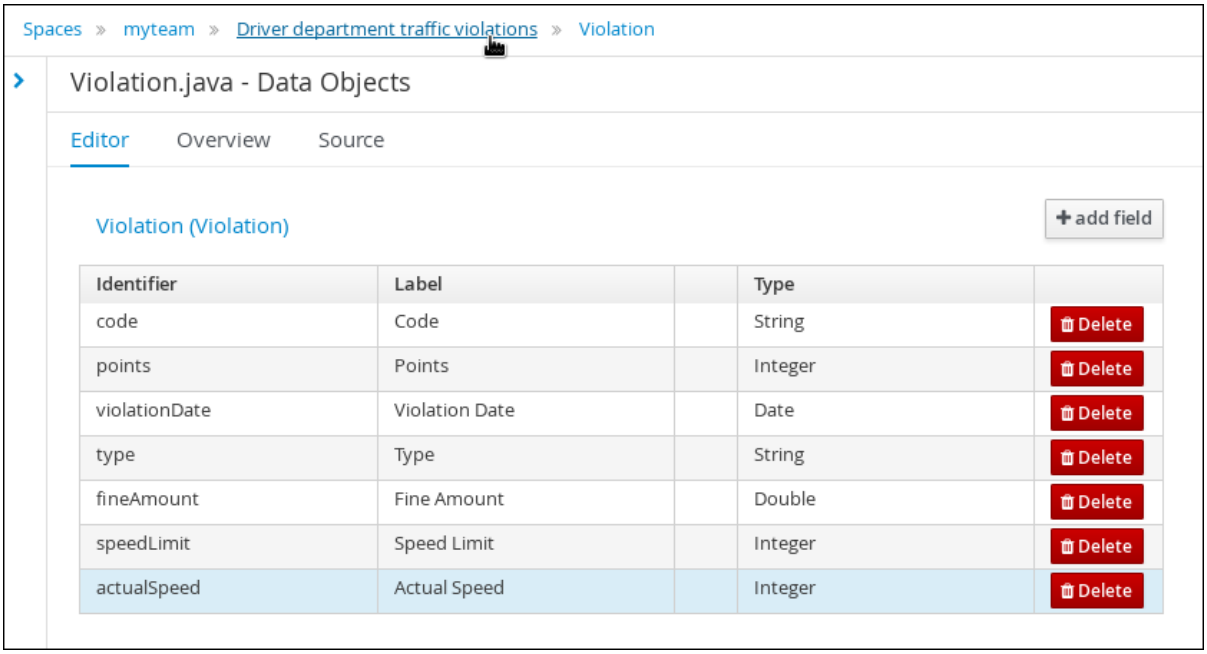
2. Click **+ add field**.
3. Enter the following values:

- **Id**: `code`
- **Label**: `Code`
- **Type**: `String`

4. Click **Create and continue**, then enter the following values:
   - **Id**: `points`
   - **Label**: `Points`
   - **Type**: `Integer`
5. Click **Create and continue**, then enter the following values:
   - **Id**: `violationDate`
   - **Label**: `Violation Date`
   - **Type**: `Date`
6. Click **Create and continue**, then enter the following values:
   - **Id**: `type`
   - **Label**: `Type`
   - **Type**: `String`
7. Click **Create and continue**, then enter the following values:
   - **Id**: `fineAmount`
   - **Label**: `Fine Amount`
   - **Type**: `Double`
8. Click **Create and continue**, then enter the following values:
   - **Id**: `speedLimit`
   - **Label**: `Speed Limit`
   - **Type**: `Integer`
9. Click **Create and continue**, then enter the following values:
   - **Id**: `actualSpeed`
   - **Label**: `Actual Speed`
   - **Type**: `Integer`
10. Click **Create**.
11. Click **Save**, then click **Save** to confirm your changes.

12. Click the **Driver department traffic violations** label to return to the **Assets** view of the project.

Figure 2.4. Violation data object fields



2.2. CREATING THE DRIVER DATA OBJECT

The **`Driver`** data object contains data fields based on driver details, such as **`Name`**, **`Age`**, and **`Total Points`**.

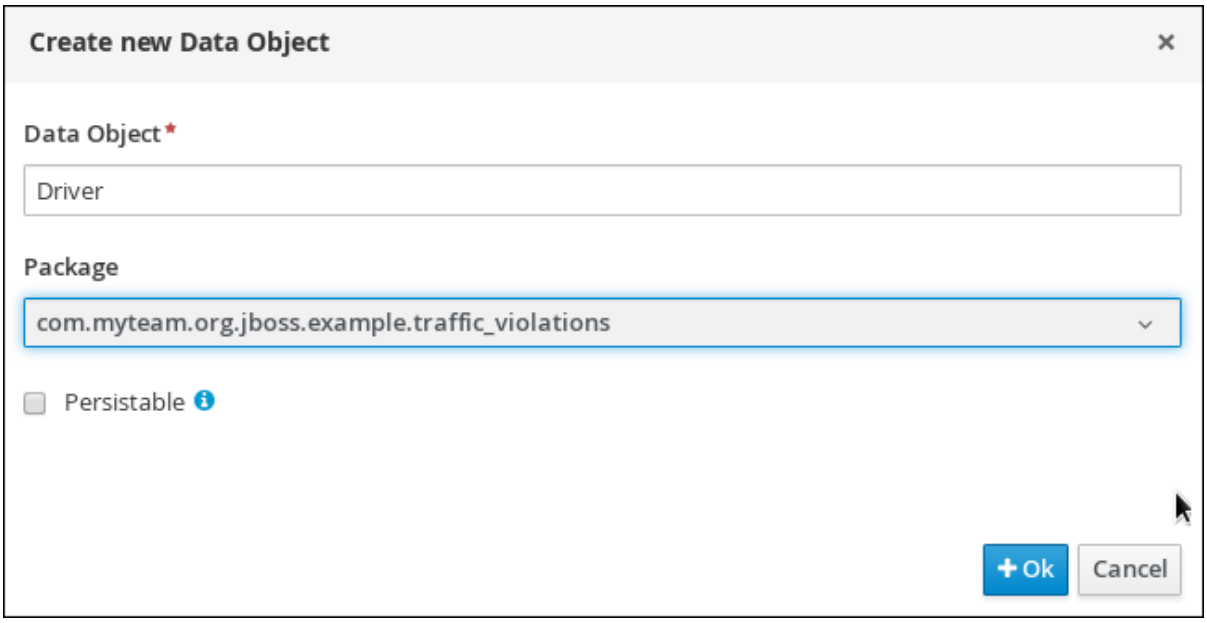
Prerequisites

You have created the **`Driver department traffic violations`** project.

Procedure

1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Create New Asset** → **Data Object**.
3. In the **Create new Data Object** wizard, enter the following values:
   - **Data Object**: **`Driver`**.
   - **Package**: select **`com.myteam.driverdepartmenttrafficviolations`**.
4. Click **Ok**.

Figure 2.5. Create new Data Object window



2.2.1. Adding the Driver data object data fields

Prerequisites

You have created the **`Driver`** data object.

Procedure

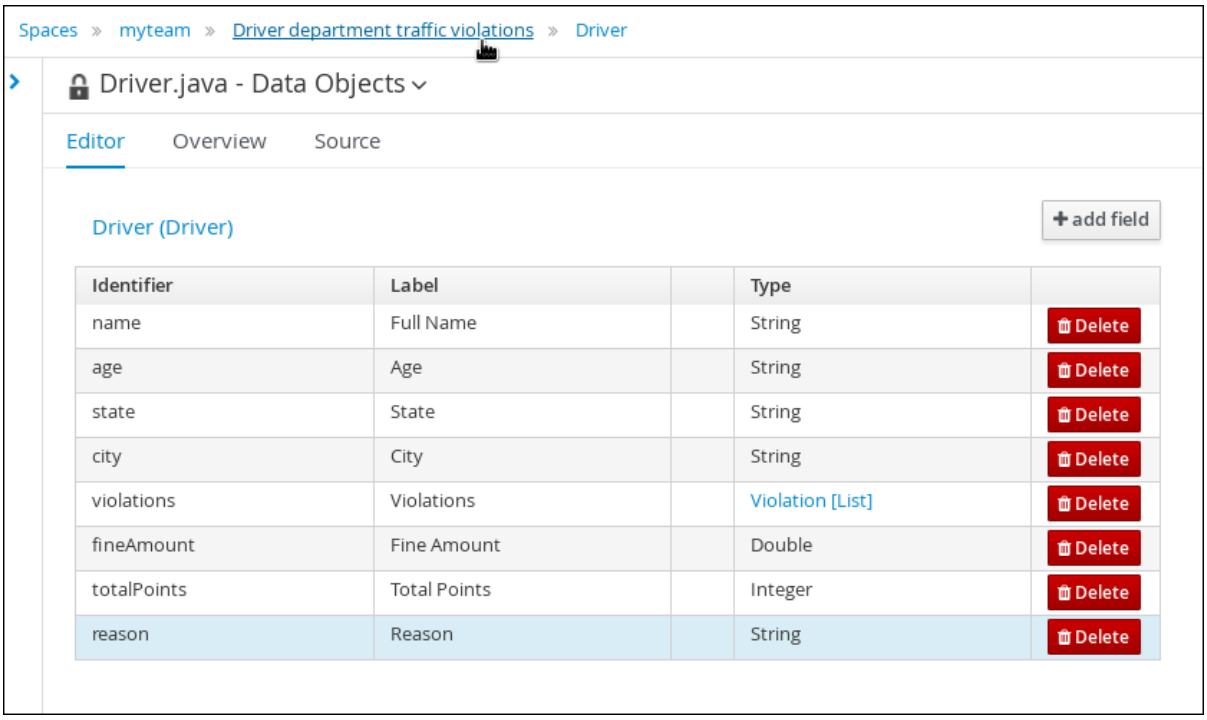
The data fields in the **`Driver`** data object define the driver details that you can select from when you define your violation rules later.

1. In the **`'Driver'- general properties`** section, locate the **Label** property and enter: **Driver**.
2. Click **+ add field**.
3. Enter the following values:
   - **Id**: **`name`**
   - **Label**: **`Full Name`**
   - **Type**: **`String`**
4. Click **Create and continue**, then enter the following values:
   - **Id**: **`age`**
   - **Label**: **`Age`**
   - **Type**: **`Integer`**
5. Click **Create and continue**, then enter the following values:
   - **Id**: **`state`**
   - **Label**: **`State`**

- **Type**: `String`

6. Click **Create and continue**, then enter the following values:
   - **Id**: `city`
   - **Label**: `City`
   - **Type**: `String`
7. Click **Create and continue**, then enter the following values:
   - **Id**: `violations`
   - **Label**: `Violations`
   - **Type**: `Violation(com.myteam.driverdepartmenttrafficviolations.Violation)`
   - **List**: Select this check box to enable the field to hold multiple items for the specified type.
8. Click **Create and continue**, then enter the following values:
   - **Id**: `fineAmount`
   - **Label**: `Fine Amount`
   - **Type**: `Double`
9. Click **Create and continue**, then enter the following values:
   - **Id**: `totalPoints`
   - **Label**: `Total Points`
   - **Type**: `Integer`
10. Click **Create and continue**, then enter the following values:
    - **Id**: `reason`
    - **Label**: `Reason`
    - **Type**: `String`
11. Click **Create**.
12. Click **Save**, then click **Save** to confirm your changes.
13. Click the **Driver department traffic violations** label to return to the **Assets** view of the project.

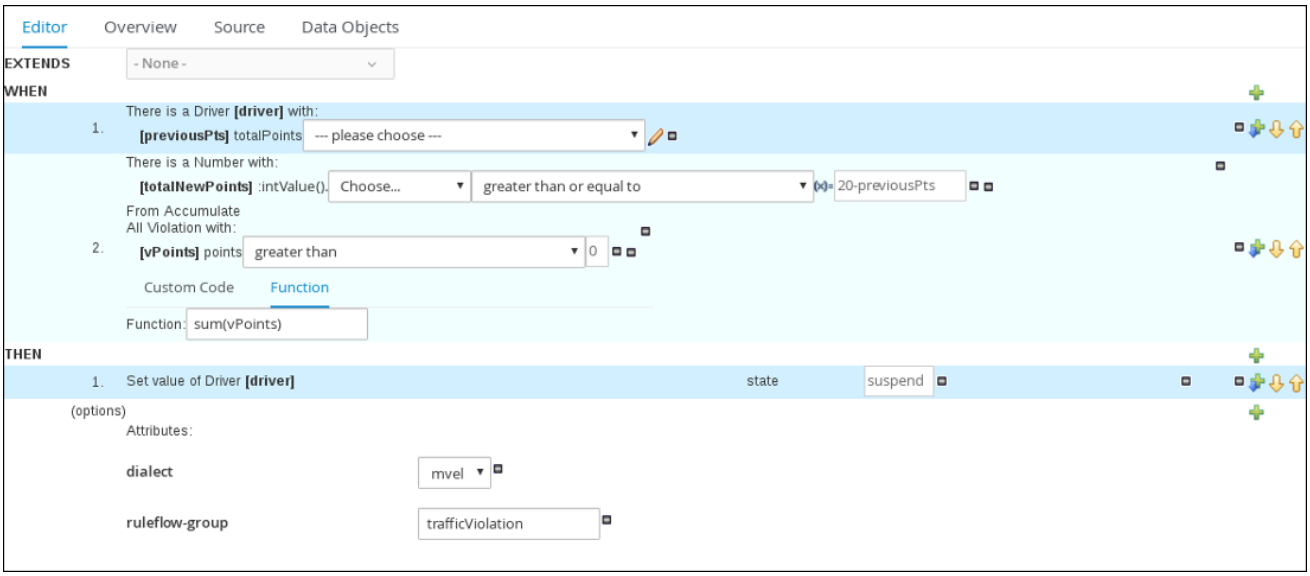
Figure 2.6. Driver data object fields



CHAPTER 3. GUIDED RULES

Guided Rules are business rules that you can create in a UI-based Guided Rules designer that leads you through the rule creation process. The rule designer provides fields and options for acceptable input based on the object model of the rule being edited. All data objects related to the rule must be in the same project package as the rule. Assets in the same package are imported by default. You can use the **Data Objects** tab of the rule designer to verify that all required data objects are listed or to import any other needed data objects.

Figure 3.1. The Guided Rule designer



3.1. CREATING THE DRIVER LICENSE SUSPENSION RULE

The **`Driver license suspension`** rule is created using the Guided Rule wizard and is comprised of various conditions and their resulting actions.

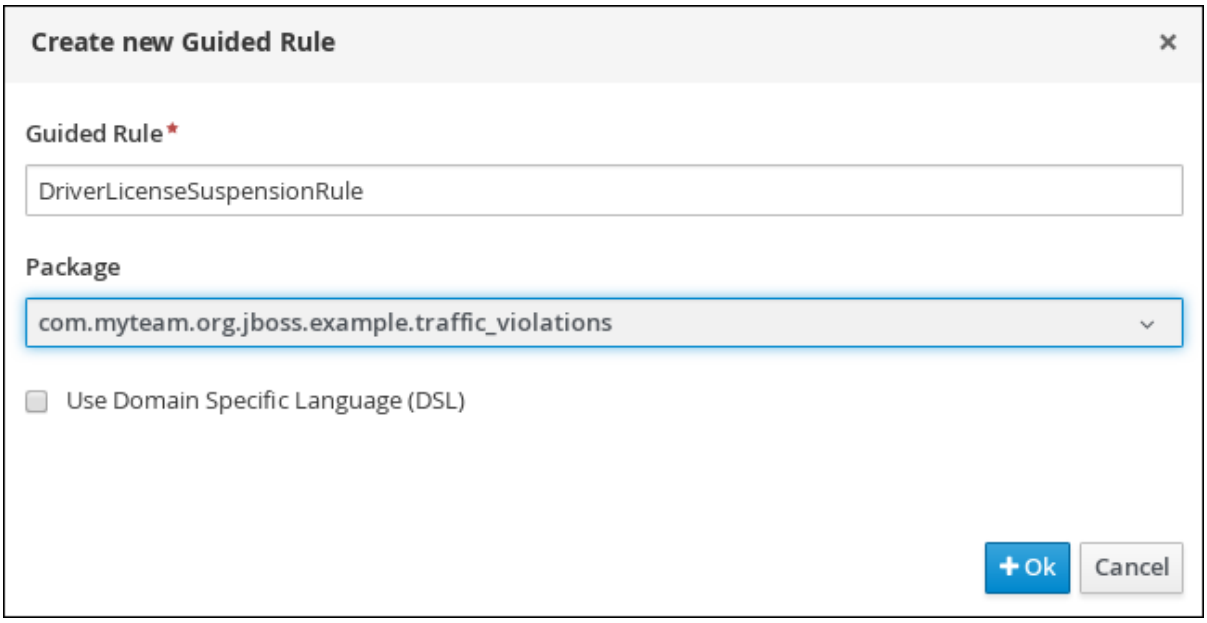
Prerequisite

Created both the **`Violation`** and **`Driver`** data objects.

Procedure

1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Create New Asset** → **Guided Rule**, then enter:
   - **Guided Rule**: **`DriverLicenseSuspensionRule`**
   - **Package**: **`com.myteam.driverdepartmenttrafficviolations`**
3. Click **Ok** to open the **Guided Rule designer**.

Figure 3.2. Create new Guided Rule window



3.2. SETTING THE SUSPENSION RULE CONDITIONS

The **`Suspension`** rule contains conditions that are used to determine the driver's violation.

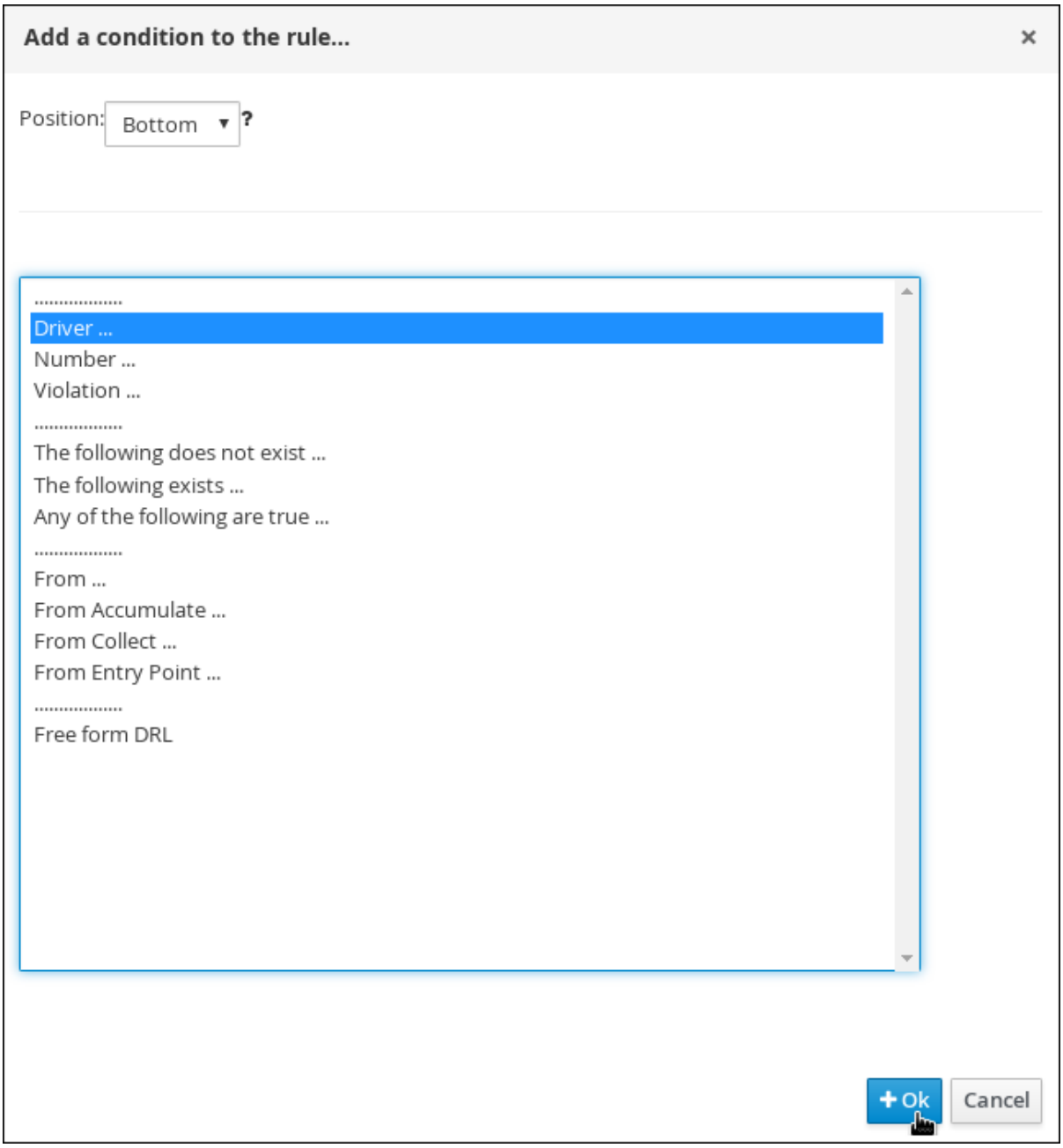
Prerequisite

You have created the Driver License Suspension rule

Procedure

1. Click  next to the **WHEN** label to open the **Add a condition to the rule** window. . . Select **Driver** and click **Ok**.

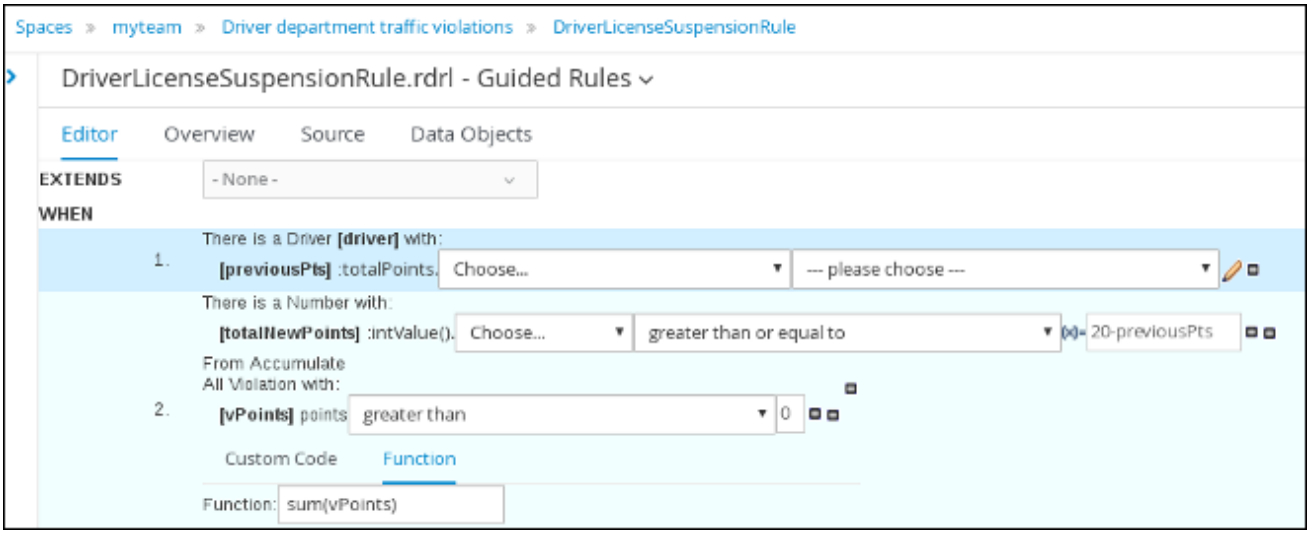
Figure 3.3. Create new Guided Rule window



2. Click the **There is a Driver** label to open the **Modify constraints for Driver** window.
3. Enter `driver` in the **Variable name** field and click **Set**.
4. Click the **There is a Driver[driver]** and click **Expression editor**.
5. Click **[not bound]** to open the **Expression editor**.
6. In the **Bind the Expression to a new variable** field, enter: `previousPts` and click **Set**.
7. From the **Choose** menu, select **totalPoints**.
8. Click  next to line 1 (the **previousPts** label) to open the **Add a condition to the rule** window.
9. Select **From Accumulate** and click **Ok**.
10. Click **click to add pattern** above the **From Accumulate** label and select **Number** from the **choose fact type** pull-down menu.

11. Click **There is a number** label to open the **Modify contraints for Driver** window.
12. Click **Expression editor** and select **intValue()** from the **[not bound]: Choose** menu.
13. Click **[not bound]** to open the **Expression editor**.
14. In the **Bind the Expression to a new variable** field, enter: **`totalNewPoints`** and click **Set**.
15. Click **click to add pattern** and select **Violation** from the **choose fact type** pull-down menu.
16. Click **All Violation with:** to open the **Modify contraints for Violation** window and select **points** from the **Add a restriction on a field** pull-down menu.
17. Click **please choose** next to the **points** label and select **greater than**.
18. Click , then click **Literal value**.
19. Click the **points** label to open the **Add a field** window and enter **`vPoints`** and click **Set**.
20. In the **Function** field, enter **`sum(vPoints)`**.
21. Select **greater than or equal to** from the **totalNewPoints → please choose** pull-down menu.
22. Click , click **New formula**, and enter **`20-previousPts`** in the new field.
23. Click **Save**, then click **Save** to confirm your changes.

Figure 3.4. Suspension Rule conditions



3.3. SETTING THE SUSPENSION RULE ACTIONS

The **`Suspension`** rule actions determine a driver's resulting penalties including points and fine amounts based on the **`Suspension`** rule conditions.

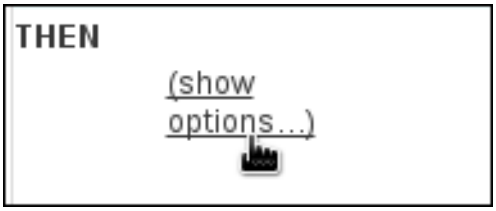
Prerequisite

You have created set the Suspension rule conditions

Procedure

1. Click **(show options...)**.

Figure 3.5. show options selection



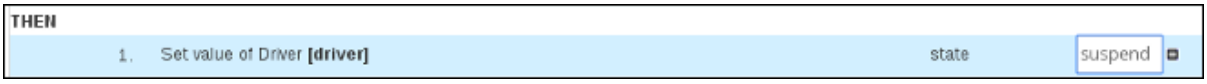
2. Click  next to the **THEN** label and select **Change field values of driver**, then click **Ok**.

3. Click the **Set value of Driver [driver]** field and select **state** from the **Add field** pull-down menu.

4. Click  next to **state** in the **Set value of Driver [driver]** section to open the **Field value** window.

5. Click **Literal value** and enter **suspend** in the new field.

Figure 3.6. New field



6. Click  next to the **(options)** label below the **Set value of Driver [driver]** section.

7. From the **Add an option to the rule** window, select the **ruleflow-group** option from the **Attribute** pull-down menu.

8. Enter **`trafficViolation`** in to the **ruleflow-group** field.

9. Click **Save**, then click **Save** to confirm your changes.

Figure 3.7. Suspension rule actions

CHAPTER 4. GUIDED DECISION TABLES

Guided decision tables are a wizard-led alternative to uploaded decision table spreadsheets for defining business rules in a tabular format. With guided decision tables, you are led by a UI-based wizard in Decision Central that helps you define rule attributes, metadata, conditions, and actions based on specified data objects in your project. After you create your guided decision tables, the rules you defined are compiled into Drools Rule Language (DRL) rules as with all other rule assets.

All data objects related to a guided decision table must be in the same project package as the guided decision table. Assets in the same package are imported by default. After the necessary data objects and the guided decision table are created, you can use the **Data Objects** tab of the guided decision tables designer to verify that all required data objects are listed or to import other existing data objects by adding a **New item**.

4.1. CREATING A TRAFFIC VIOLATION GUIDED DECISION TABLE

Use the Guided Decision Table designer to create the traffic violation guided decision table, which specifies the driver's specific violation and the resulting fine and points.

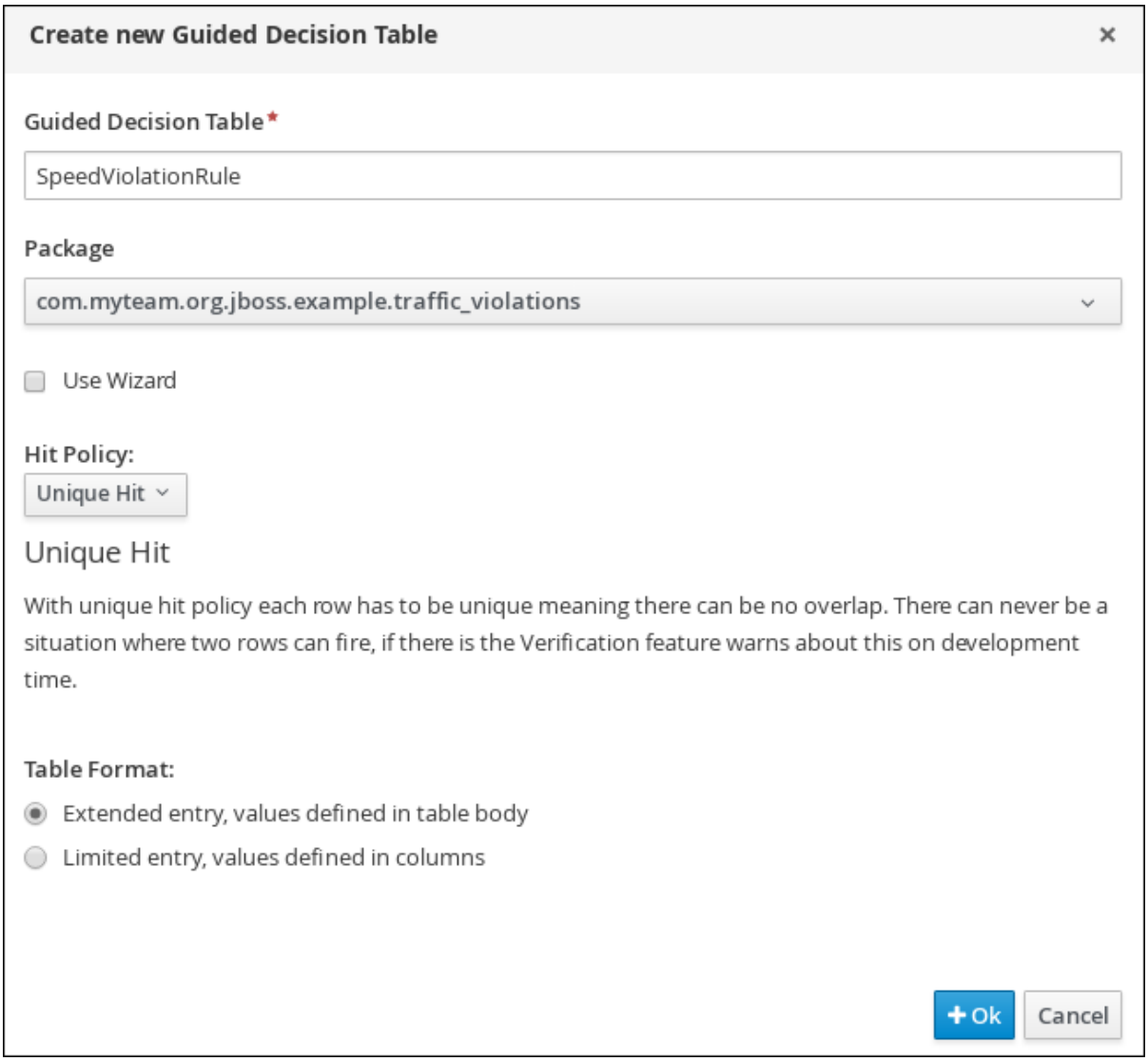
Prerequisite

Created both the **`Violation`** and **`Driver`** data objects.

Procedure

1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Create New Asset** → **Guided Decision Table**, then enter:
   - **Guided Decision Table**: **`SpeedViolationRule`**
   - **Package**: **`com.myteam.driverdepartmenttrafficviolations`**
3. Select **Unique Hit** from the **Hit Policy** pull-down menu.
4. Select **Extended entry, values defined in table body** in the **Table format** section.
5. Click **Ok** to open the **Guided Decision Tables** designer.

Figure 4.1. Guided Decision Tables designer



4.1.1. Inserting Violation Type columns

The **`Violation Type`** column contains the violation details such as the the driver's speed and if the driver was under the influence of drugs or alcohol.

Prerequisite

Created the traffic violation guided decision table.

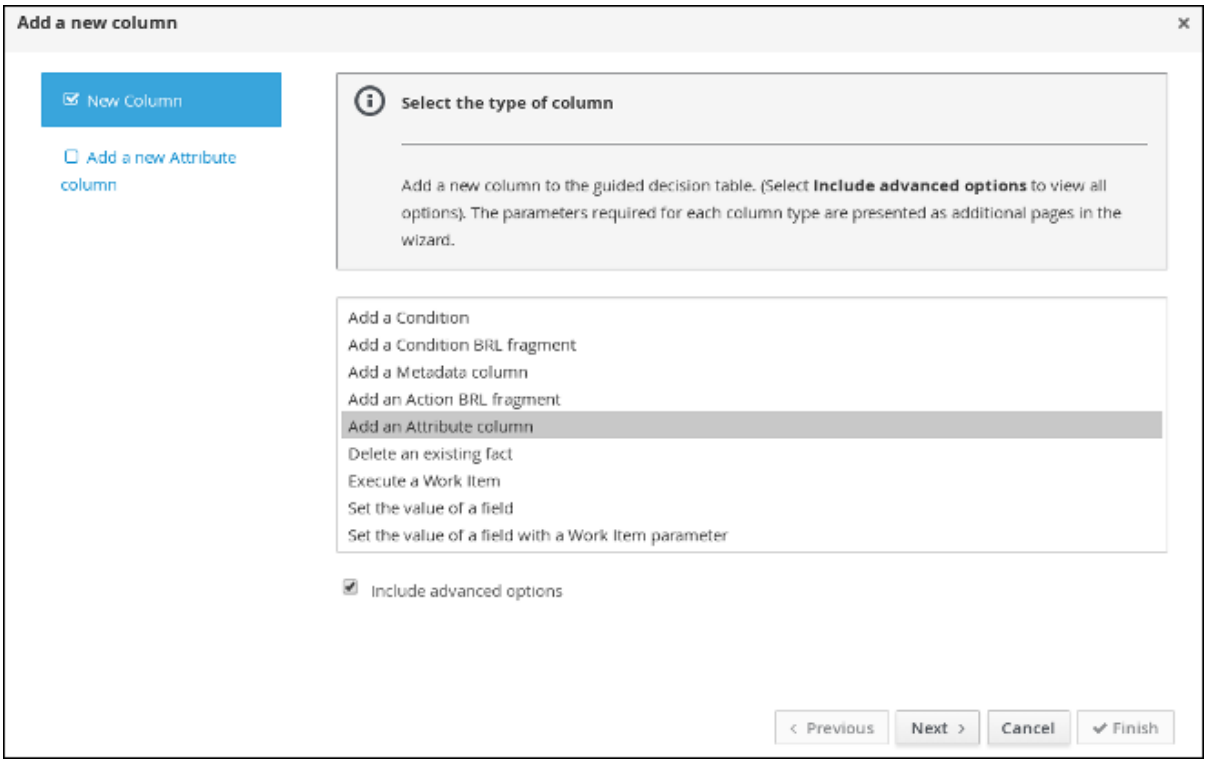
Procedure

1. Click **Columns** → **Insert Column** and select **Include advanced options**.

Figure 4.2. Column tab

2. Select **Add an Attribute column** and click **Next**.

Figure 4.3. Add a new column window

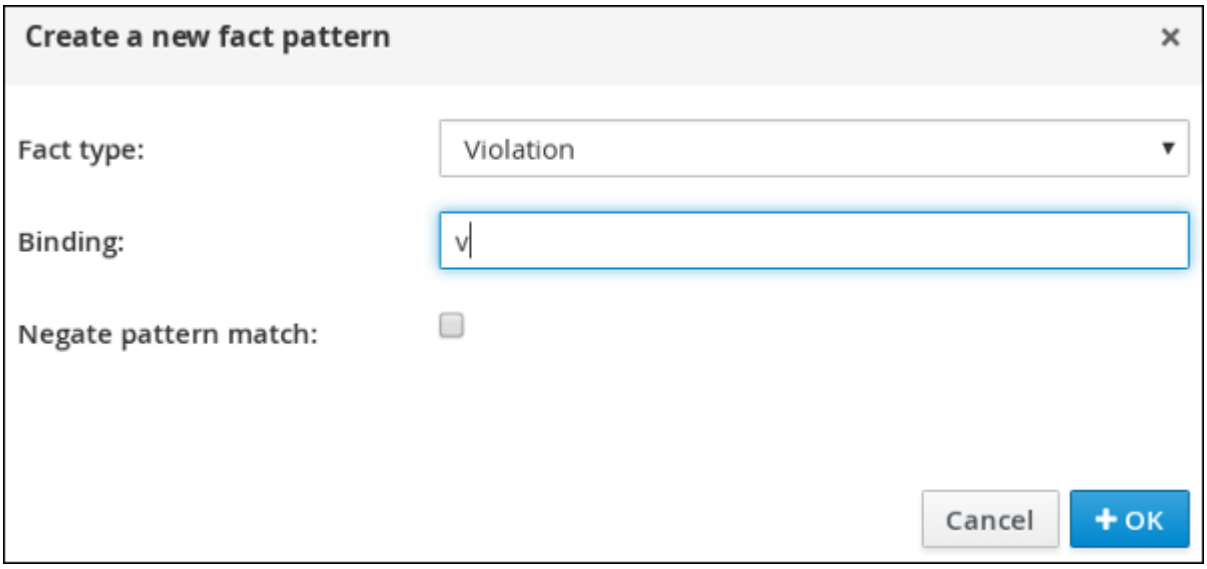


3. Select **Ruleflow-group** and click **Finish**.
4. Expand **Attribute columns** and enter `trafficViolation` in the **Default value** field.

Figure 4.4. Attribute columns window

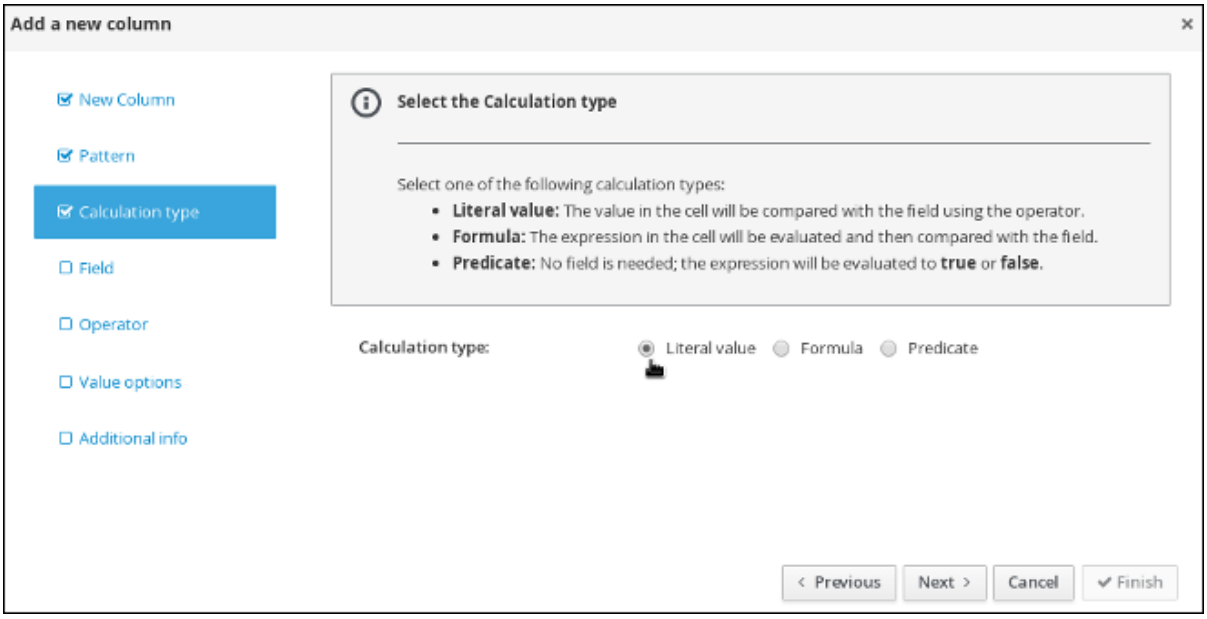
5. Click **Insert Column**, select **Add a Condition** → **Pattern** → **+Create a new Fact Pattern**.
6. Select **Violation** from the **Fact type** pull-down menu, enter **v** in the **Binding** field, and click **OK**.

Figure 4.5. Create a new fact pattern window



7. Select **Calculation type** → **Literal value**.

Figure 4.6. Calculation type options



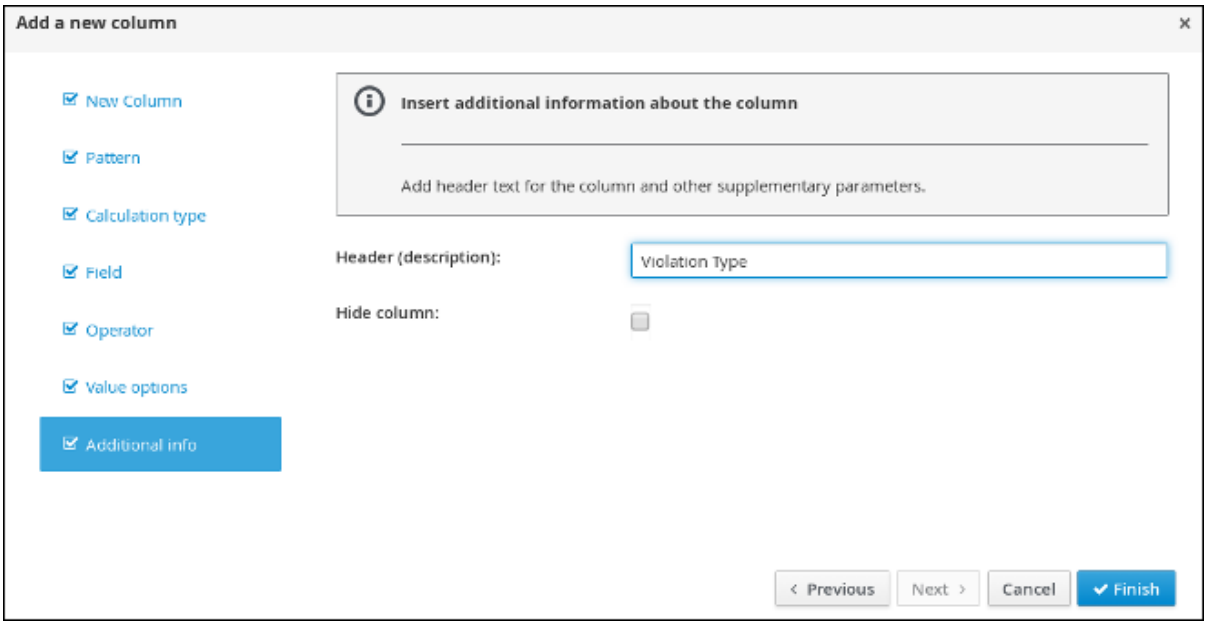
8. Select **Field** and then select **type** from the **Field** pull-down menu.

9. Select **Operator** and then **equal to** from the **Operator** pull-down menu.

10. Select **Value options** and enter **`Speed,Driving while intoxicated,DWI=Driving while under the influence of drugs`** in the **Value list (optional)** field.

11. Select **Additional info**, enter **`Violation Type`** in the **Header (description)** field, and click **Finish**.

Figure 4.7. Violation Type header



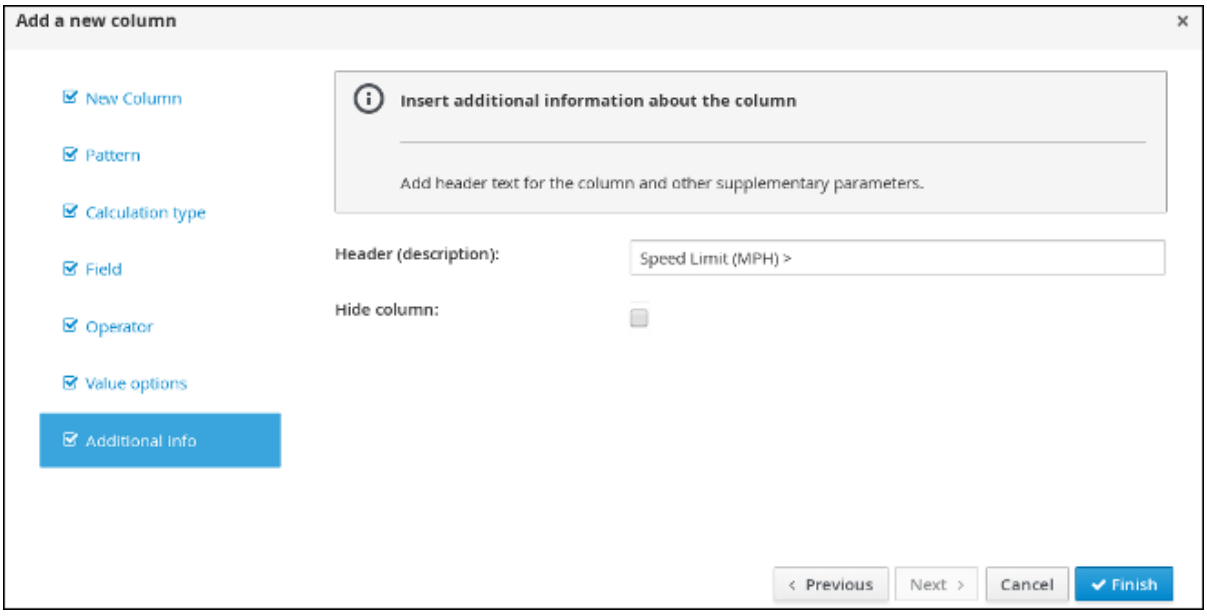
12. Click **Insert Column**, select **Add a Condition** → **Pattern**, and select **Violation[v]** from the **Pattern** pull-down menu.

13. Select **Calculation type** → **Predicate** → **Field** and enter **`actualSpeed-speedLimit > $param`**.

14. Select **Value options**, then select **Additional info** and enter **`Speed Limit (MPH) >`** in the **Header (description)** field.

15. Click **Finish**.

Figure 4.8. Speed Limit (MPH) > header



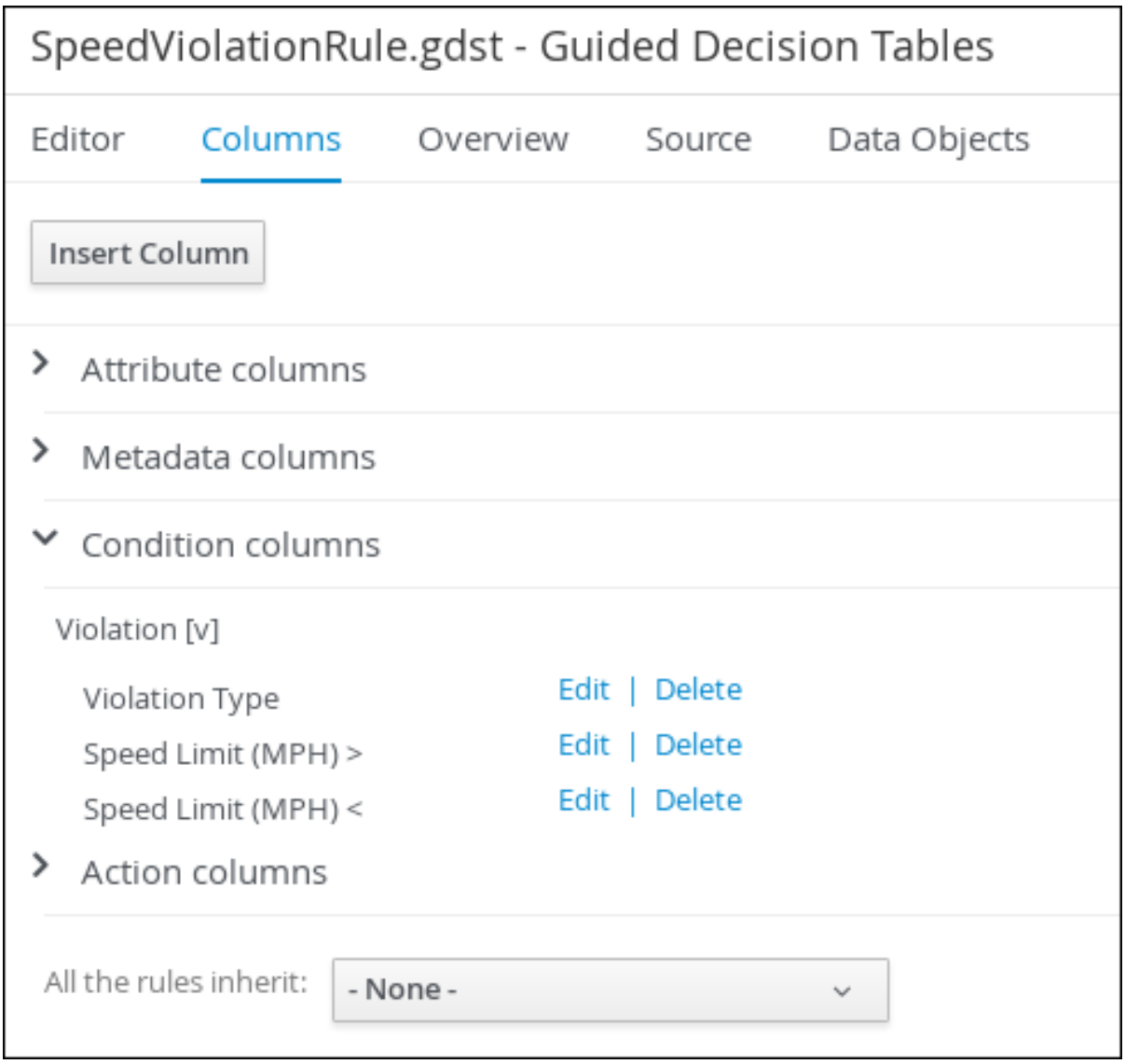
16. Click **Insert Column**, select **Add a Condition** → **Pattern**, and select **Violation[v]** from the **Pattern** pull-down menu.

17. Select **Calculation type** → **Predicate**.

18. Select **Field** and enter **`actualSpeed-speedLimit < $param`** in the **Field** field.

19. Select **Operator**, select **Value options**, then select **Additional info**.
20. Enter **`Speed Limit (MPH) <`** in the **Header (description)** field and click **Finish**.

Figure 4.9. Condition columns



4.1.2. Inserting `Fine Amount` and `Points` columns

The **`Fine Amount`** and **`Points`** columns contain the fines and points based on the corresponding **`Violation Type`** field values.

Prerequisite

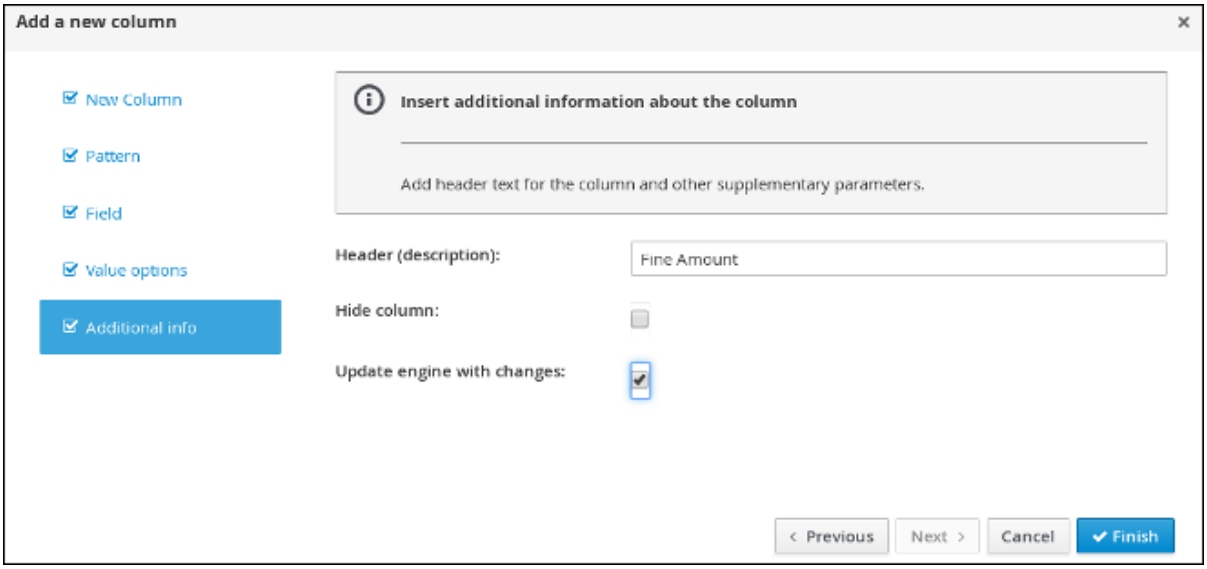
Inserted the **`Violation Type`** column.

Procedure

1. Click **Insert Column**, select **Set the value of a field** → **Pattern**, and select **Violation[v]** from the **Pattern** pull-down menu.
2. Select **Field** and then **fineAmount** from the **Field** pull-down menu.
3. Select **Value options**, then select **Additional info** and enter **`Fine Amount`** in the **Header (description)** field.

4. Select the **Update engine with changes** option and click **Finish**.

Figure 4.10. Fine Amount header



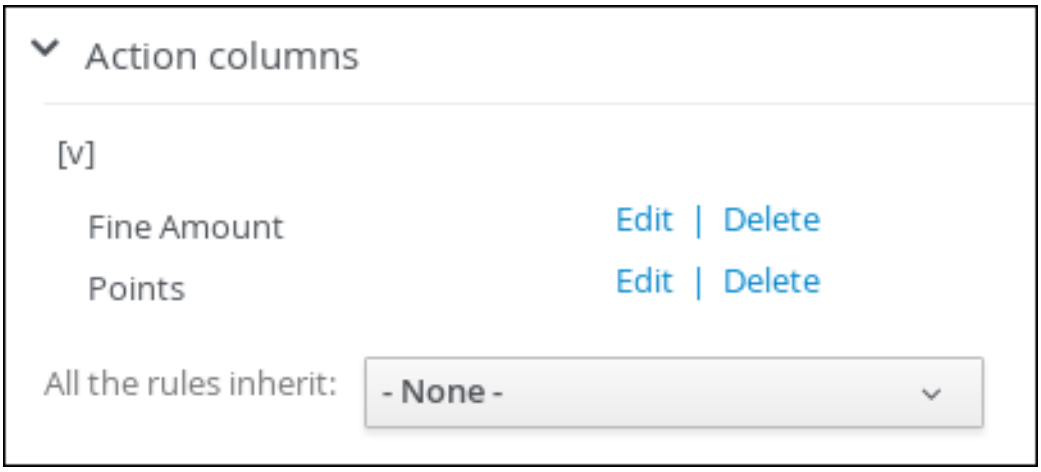
5. Click **Insert Column**, select **Set the value of a field → Pattern**, and select **Violation[v]** from the **Pattern** pull-down menu.

6. Select **Field** and then **points** from the **Field** pull-down menu.

7. Select **Value options**, then select **Additional info** and enter **`Points`** in the **Header (description)** field.

8. Select the **Update engine with changes** option and click **Finish**.

Figure 4.11. Action columns



9. Click **Columns**, expand **Attribute columns**, and select the **Hide column** option.

Figure 4.12. Column attributes

4.1.3. Inserting guided decision table rows

After you have created your columns in the guided decision table, you can add rows and define rules within the decision table designer.

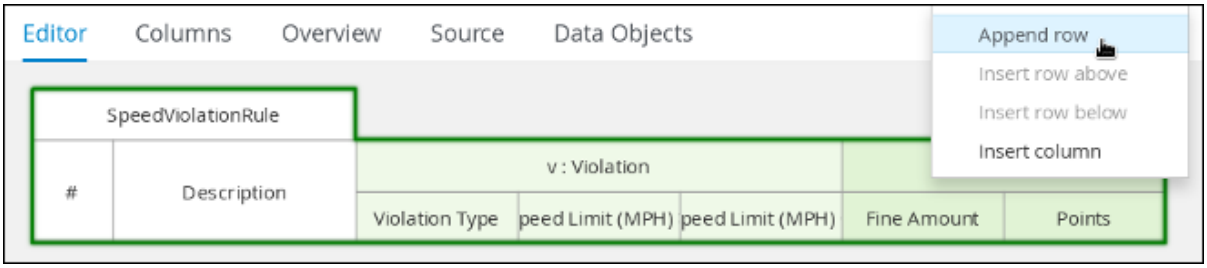
Prerequisite

You have created the **`Violation Type`**, **`Fine Amount`**, and **`Points`** columns.

Procedure

1. Click **Editor** → **Insert** → **Append row**. Repeat this step to add a total of five table rows.

Figure 4.13. Appending rows



2. Fill out the table as shown in the following example.

Figure 4.14. Populated data fields

SpeedViolationRule

U	Description	ruleflow-group	v : Violation			v	
			Violation Type	Speed Limit (MPH) >	Speed Limit (MPH) <	Fine Amount	Points
1		trafficViolation	Speed	10	20	100	1
2		trafficViolation	Speed	20	30	200	2
3		trafficViolation	Speed	30	40	300	3
4		trafficViolation	Driving while intoxicated			500	4
5		trafficViolation	Driving while under the influence of drugs			500	4

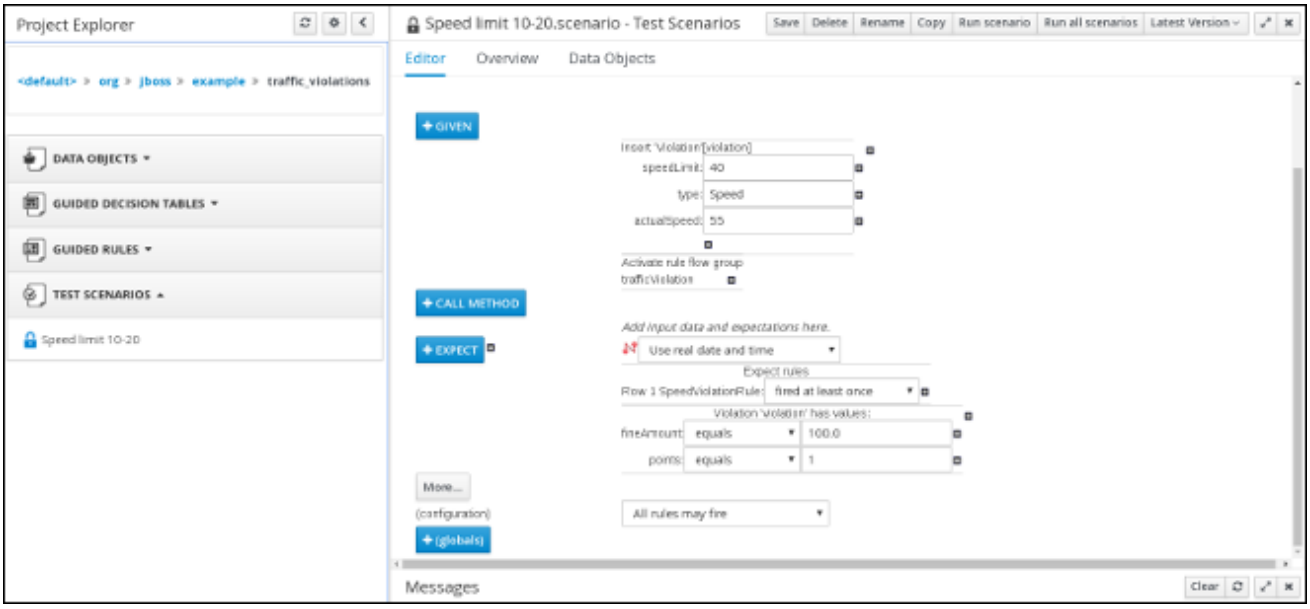
3. Click **Save**, then click **Save** to confirm your changes.

CHAPTER 5. TEST SCENARIOS

Test Scenarios in Red Hat Decision Manager enable you to validate the functionality of rules, models, and events before deploying them into production. A test scenario uses data for conditions that resemble an instance of your fact or project model. This data is matched against a given set of rules and if the expected results match the actual results, the test is successful. If the expected results do not match the actual results, then the test fails.

After you run all test scenarios, the status of the scenarios is reported in a **Reporting** panel.

Figure 5.1. Speed test scenario screen



Test scenarios can be executed one at a time or as a group. The group execution contains all the scenarios from one package. Test scenarios are independent, so that one scenario cannot affect or modify the other.

5.1. TESTING THE SPEED LIMIT SCENARIO

Test the speed limit scenario using the data that you specified when you created the speed violation guided decision table.

Prerequisites

- Created the **`Driver department traffic violations`** project
- Created the **`Violation`** and **`Driver`** data objects
- Created the speed violation guided decision table

Procedure

1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Projects** → **Create New Asset** → **Test Scenario**.
3. In the **Create new Test Scenario window** wizard, enter the following values:

a. **Test Scenario**: `Speed limit 10-20`.

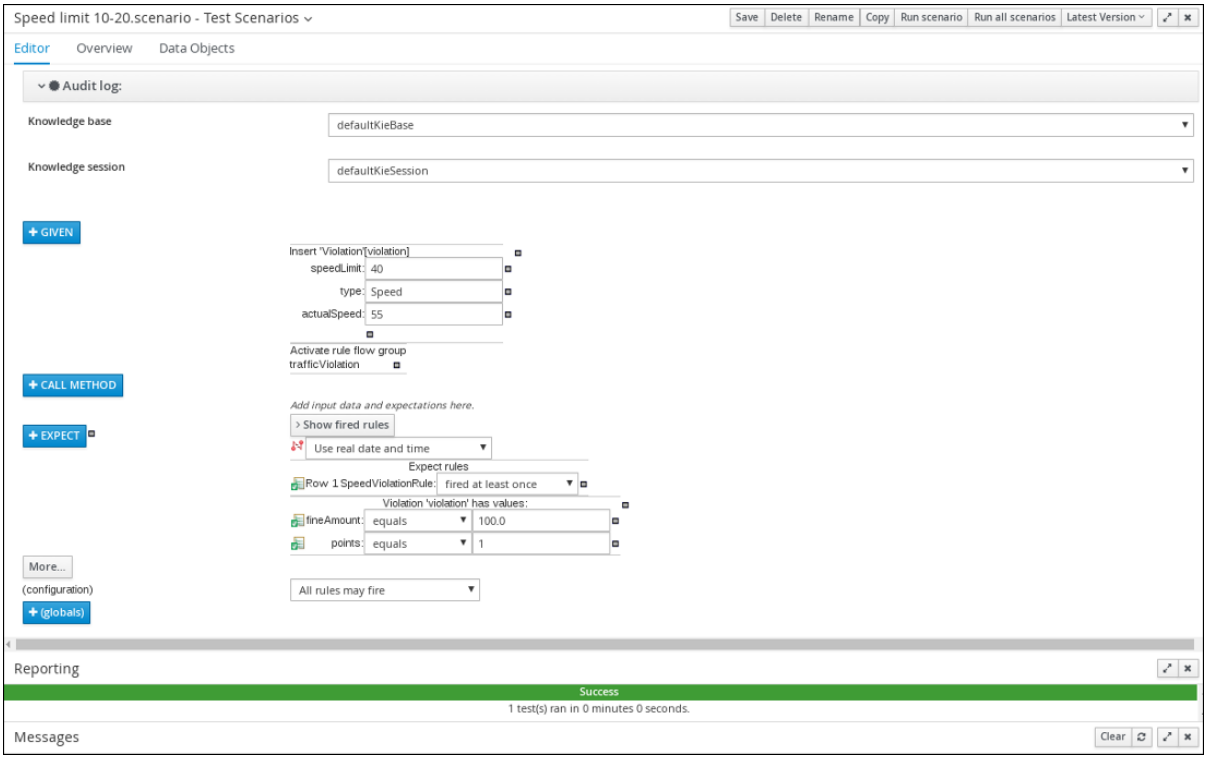
b. **Package**: select `com.myteam.driverdepartmenttrafficviolations`.

4. Click **Ok**.
5. Click **+GIVEN** to open the **New input** window.
6. Select **Violation** from the **Insert a new fact** pull-down menu.
7. Enter `violation` in the **Fact name** field and click **Add**.
8. Click **Add a field** located under **Insert 'Violation'[violation]** to open the **Choose a field to add** window.
9. Select **speedLimit** from the **Choose a field to add** pull-down menu and click **OK**.
10. Click  , then click **Literal value** next to **speedLimit**.
11. Click **Literal value** in the **Field value** window, then enter `40` in the **speedLimit** field.
12. Click **Insert 'Violation'[violation]** and select **type** from the **Choose a field to add** pull-down menu in the **Choose a field to add** window, and click **OK**.
13. Click  , then click **Literal value** next to **Literal value**.
14. Enter `Speed` in the **type** field.
15. Click **Insert 'Violation'[violation]**, and select **actualSpeed** from the **Choose a field to add** pull-down menu, and click **OK**.
16. Click  , then click **Literal value** next to **Literal value**.
17. Enter `55` in the **actualSpeed** field.
18. Click **+Expect** to open the **New expectation** window.
19. Expand the **Rule** pull-down menu, select **Row 1 SpeedViolationRule**, and click **OK**.
20. Click **+GIVEN** to open the **New input** window, enter `trafficViolation` in the **Activate rule flow group** field, and click **Add**.
21. Click **+Expect** to open the **New expectation** window and click **Add** next to **Fact value: violation**.
22. Click **Violation 'violation' has values:** to open the **Choose a field to add** window.
23. Select **fineAmount** from the **Choose a field to add** pull-down menu and click **OK**.
24. Enter `100.0` in the **fineAmount: equals** field.
25. Click **Violation 'violation' has values:** to open the **Choose a field to add** window.
26. Select **points** from the **Choose a field to add** pull-down menu and click **OK**.
27. Enter `1` in the **points: equals** field.

28. Click **Save**, then click **Save** to confirm your changes.

29. Click **Run scenario**.

Figure 5.2. Speed test results screen



5.2. TESTING THE DRIVER LICENSE SUSPENSION SCENARIO

Test the driver license suspension scenario using the data that you specified when you set the Driver License Suspension rules and actions.

Prerequisites

- Created the **`Driver department traffic violations`** project
- Created the **`Violation`** and **`Driver`** data objects
- Set the Driver License Suspension rules and actions

Procedure

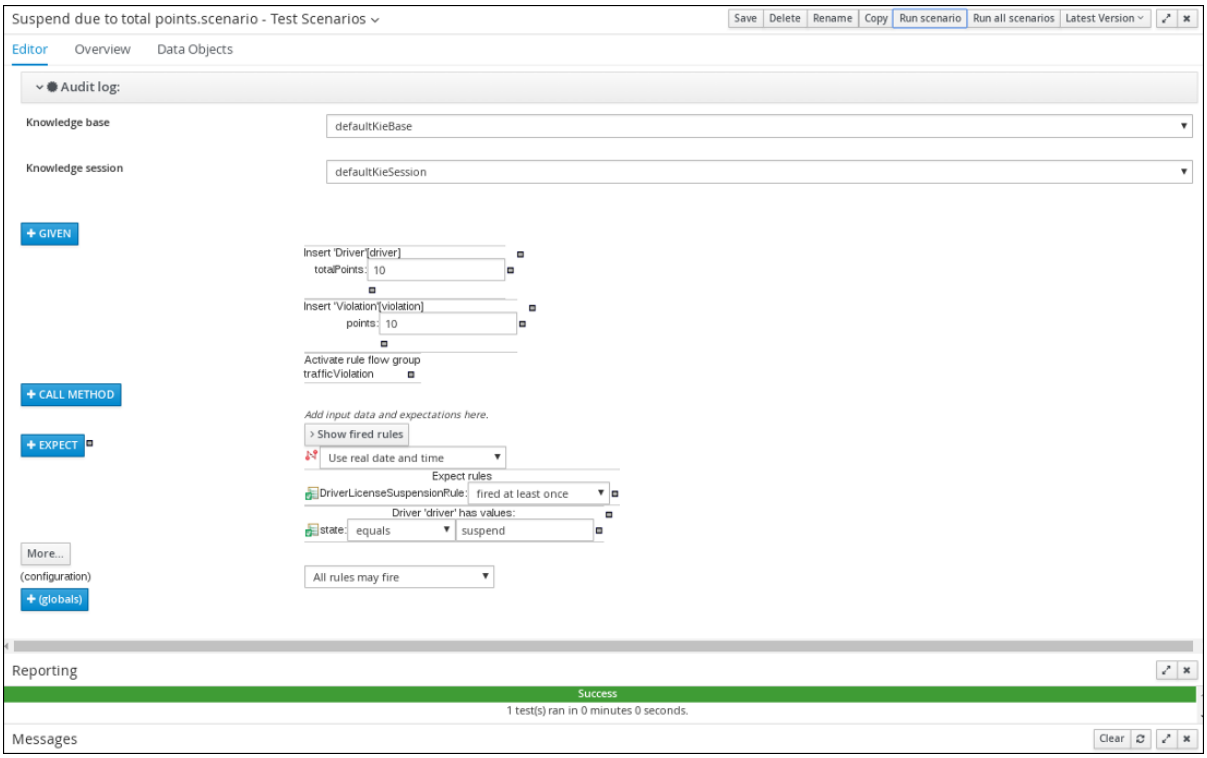
1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Create New Asset** → **Test Scenario**.
3. In the **Create new Test Scenario window** wizard, enter the following values:
   a. **Test Scenario**: **`Suspend due to total points`**.
   b. **Package**: select **`com.myteam.driverdepartmenttrafficviolations`**.
4. Click **Ok**.

5. Click **+GIVEN** to open the **New input** window.
6. Select **Driver** from the **Insert a new fact** pull-down menu.
7. Enter `driver` in the **Fact name** field and click **Add**.
8. Click **Add a field** located under **'Driver'[driver]** to open the **Choose a field to add** window.
9. Select **totalPoints** from the **Choose a field to add** pull-down menu and click **OK**.
10. Click  next to **totalPoints**, click **Literal value**, then enter `10` in the **totalPoints** field.
11. Click **+GIVEN** to open the **New input** window.
12. Select **Violation** from the **Insert a new fact** pull-down menu.
13. Enter `violation` in the **Fact name** field and click **Add**.
14. Click **Add a field** located under **Insert 'Violation'[violation]** to open the **Choose a field to add** window.
15. Select **points** from the **Choose a field to add** pull-down menu and click **OK**.
16. Click  , then click **Literal value** next to **Literal value**.
17. Enter `10` in the **points** field.
18. Click **+Expect** to open the **New expectation** window.
19. Expand the **Rule** pull-down menu, select **DriverLicenseSuspensionRule**, and click **OK**.
20. Click **+GIVEN** to open the **New input** window, enter `trafficViolation` in the **Activate rule flow group** field, and click **Add**.
21. Click **+Expect** to open the **New expectation** window and click **Add** next to **Fact value: driver**.
22. Click **Driver 'driver' has values:** to open the **Choose a field to add** window.
23. Select **state** from the **Choose a field to add** pull-down menu and click **OK**.
24. Enter **suspend** in the **state: equals** field.
25. Click **Save**, then click **Save** to confirm your changes.
26. Click **Run scenario**.

Result

The rule is fired and the driver's license is suspended because the total number of points is >= 20.

Figure 5.3. Suspension test results screen



5.3. TESTING THE MULTIPLE VIOLATIONS SCENARIO

Copy the **Suspend due to total points** asset and modify it to create the driver license suspension scenario for drivers with multiple violations using the data that you specified when you set the Driver License Suspension rules and actions.

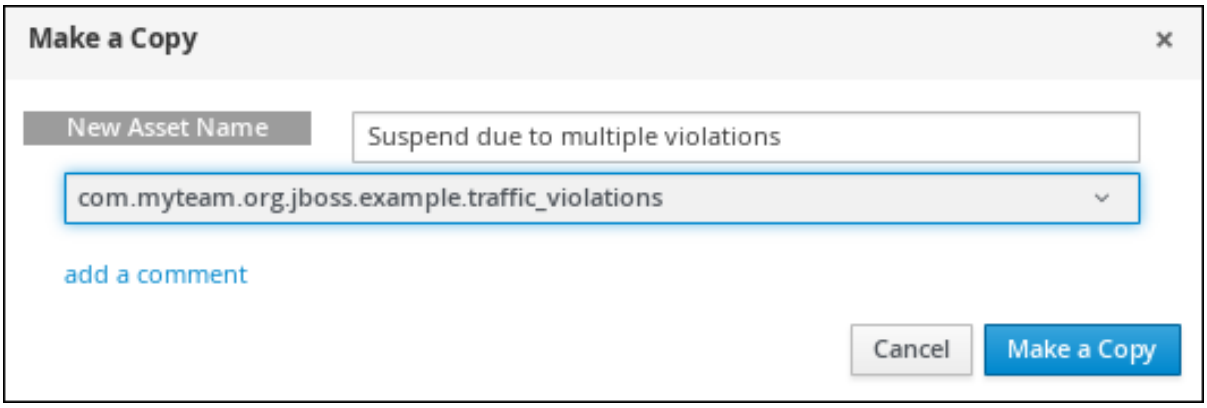
Prerequisites

- Created the **`Driver department traffic violations`** project
- Created the **`Violation`** and **`Driver`** data objects
- Set the driver license suspension rules and actions

Procedure

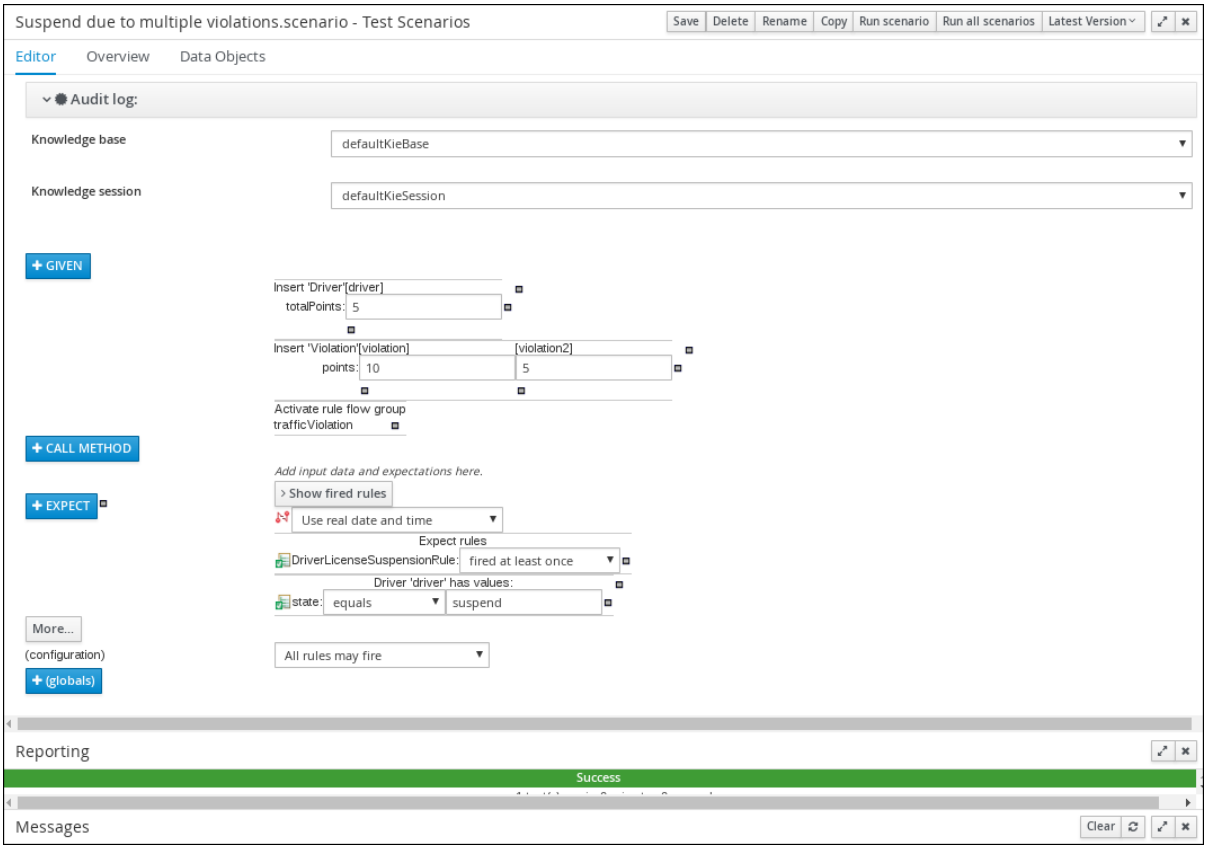
1. Log in to Decision Central. Click **Menu** → **Design** → **Projects**, then **Driver department traffic violations**.
2. Click **Suspend due to total points** → **Copy**, enter **`Suspend due to multiple violations`** in the **New Asset Name** field, and click **Make a Copy**.

Figure 5.4. Make a copy window



3. Click **Space** → **myteam** → **Driver department traffic violations**, and then select the **Suspend due to multiple violations** Asset.
4. Click **+GIVEN** to open the **New input** window.
5. Select **Violation** from the **Insert a new fact** pull-down menu.
6. Enter **`violation2`** in the **Fact name** field and click **Add**.
7. Click  next to **points**, click **Literal value**, then enter **`5`** in the **points** → **violation2** field.
8. In the **totalPoints** field, change the value from **`10`** to **`5`**.
9. Click **Save**, then click **Save** to confirm your changes.
10. Click **Run scenario**.

Figure 5.5. Suspension test results screen



APPENDIX A. VERSIONING INFORMATION

Documentation last updated on: Monday, October 1, 2018.