

PUBLIC

# **Build a Workflow from Scratch with SAP Cloud Platform Workflow Management**

## **DEV163**

Exercise 2.1 | Business Rules  
Archana Shukla / SAP

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## AUTHOR, ACTIVATE AND DEPLOY BUSINESS RULES

### OVERVIEW

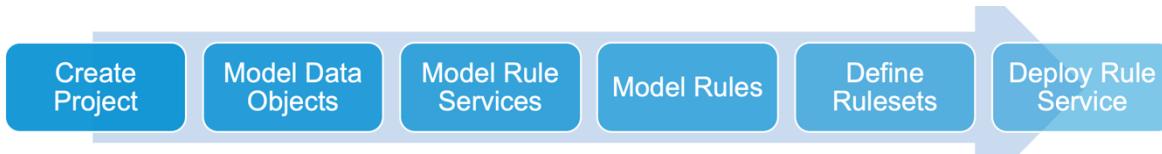
Estimated time: 45 minutes

The exercise is based on authoring and managing rules for capital expenditure, using SAP Cloud Platform Business Rules. The rule determines the approvers based on investment details.

The screenshot shows the SAP Cloud Platform Business Rules interface. At the top, there are navigation links: 'Manage Projects / Capital Expenditure Rules /' and buttons for 'Import', 'Export', 'Edit', and 'Validate'. Below this, a title 'Determine Approvers Rule' is shown with a grid icon. The main area has tabs 'Details' and 'Decision Table', with 'Decision Table' being active. The decision table is titled 'Decision Table' and has columns: 'If' (with sub-columns 'Investment.Country', 'Investment.Type', and 'Investment.Total Cost') and 'Then' (with sub-columns 'Central Manager User...', 'Local Manager User ID', 'Local Manager Appro...', and 'Central Manager Appro...'). The table contains six rows of data:

If	Then					
Investment.Country =	Investment.Type =	Investment.Total Cost	Central Manager User...	Local Manager User ID	Local Manager Appro...	Central Manager Appro...
'Germany'	'Software'	> 100	'ibpmuser000'	'ibpmuser000'	true	true
'India'	'Software'	IN [ 200 .. 1000 ]	'varun.rao.001'	'kiran.shah.012'	false	true
'India'	'Software'	> 1000	'varun.rao.001'	'kiran.shah.012'	true	true
'United States of ...'	'Building'	EXISTSIN [ 100 , 5...	'frank.mathew.023'	'peter.collins.1441'	true	false
'United States of ...'	'Equipment'	>= 2500	'frank.mathew.023'	'nina.hanks.001'	true	true

In this exercise, you will learn about different enterprise rule models and how to author them using Manage Rules Application. You will create, configure and activate these business rules models, and learn how to deploy the rule service to cloud for consumption.

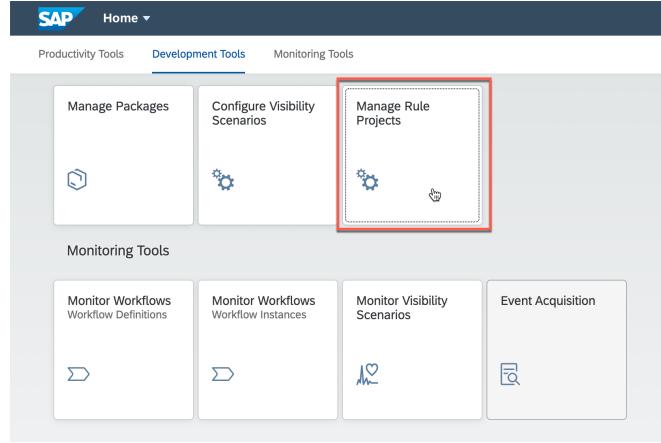
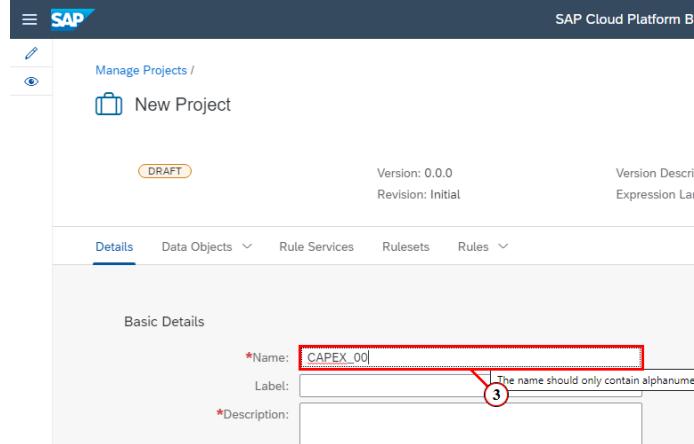
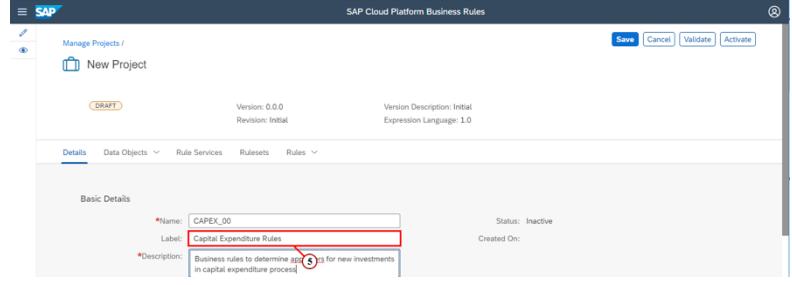


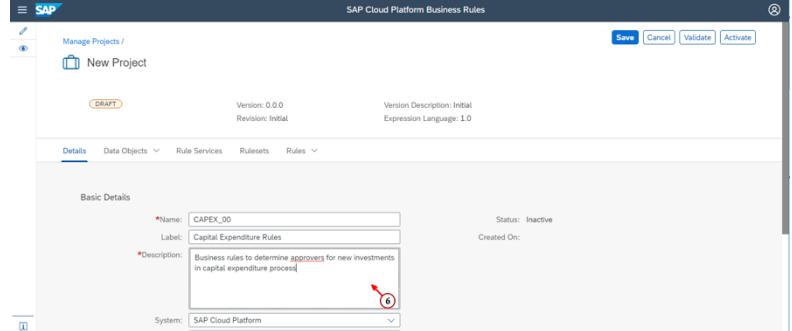
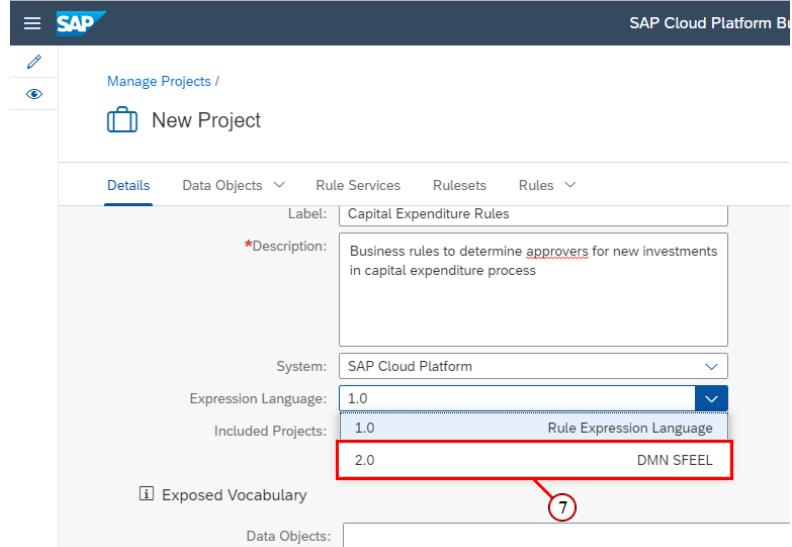
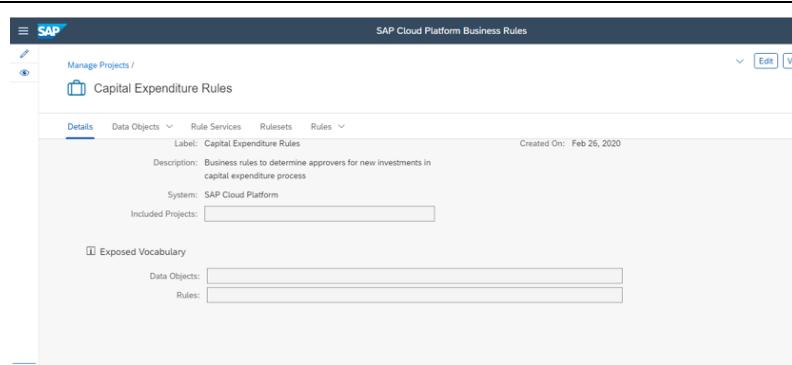
### Exercise Description:

In this exercise you will do the following:

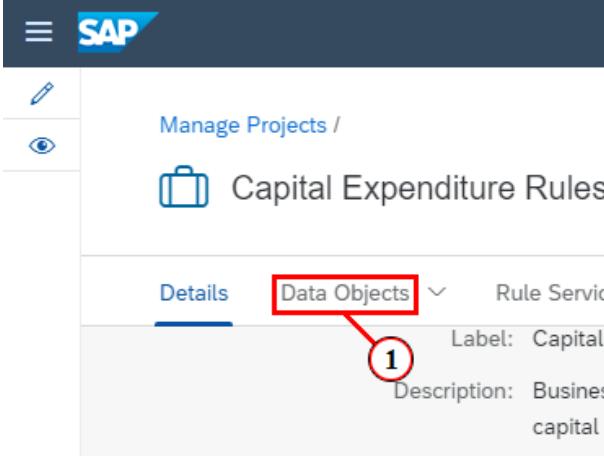
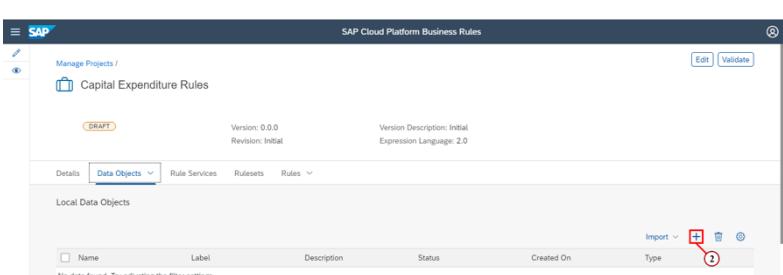
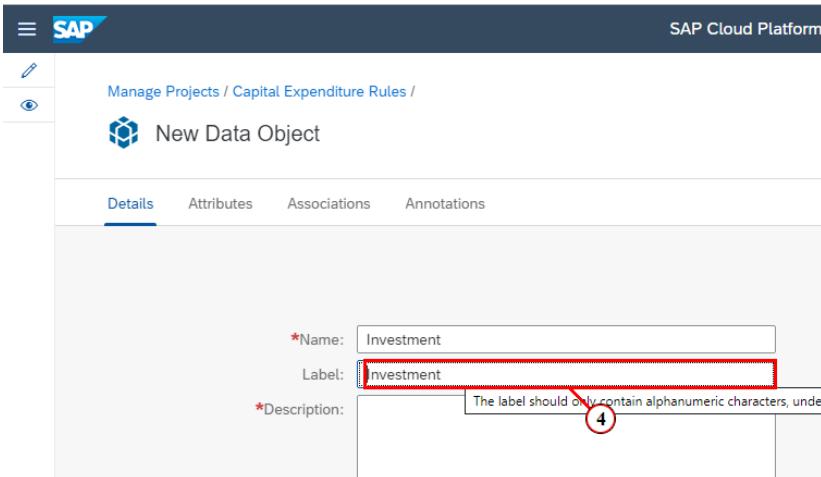
- *Create and Configure Project*
- *Create Data Objects*
- *Configure Data Object with Value Help*
- *Create Ruleservice*
- *Create Decision Table*
- *Create Ruleset*
- *Activate Projects and other Models*
- *Deploy Ruleservice in Cloud Platform*
- *Create Rule Version*
- *Test Business Rules*

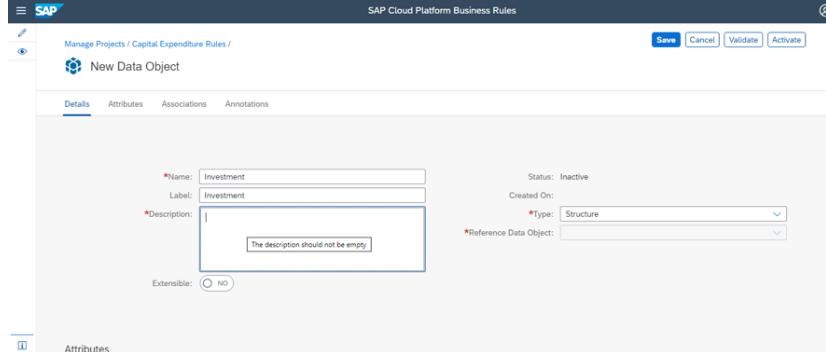
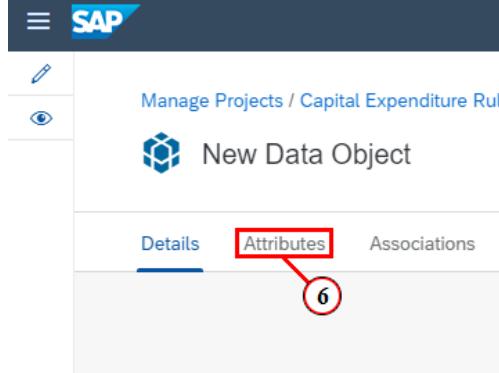
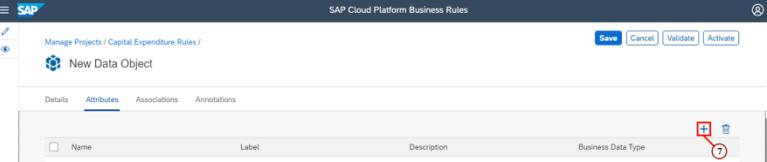
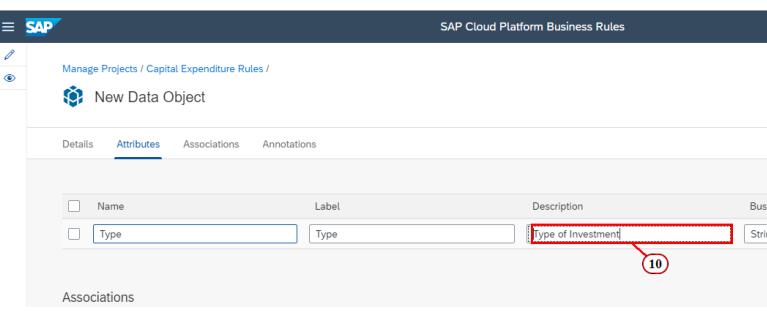
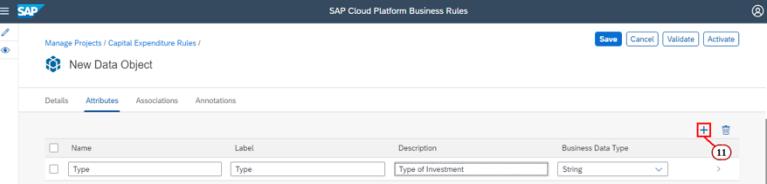
## CREATE PROJECT

Explanation	Screenshot
<p>1. Open Workflow Management Launchpad and click to open <b>Manage Rule Projects</b>.</p> <ul style="list-style-type: none"> <li>• Login with trial username and passwords</li> </ul>	
<p>2. Click <b>+</b> to create a new business rules project.</p>	
<p>3. Enter <b>CAPEX_00</b> in the <b>Name</b> box.</p>	
<p>4. Enter <b>Capital Expenditure Rules</b> in the <b>Label</b> box.</p>	

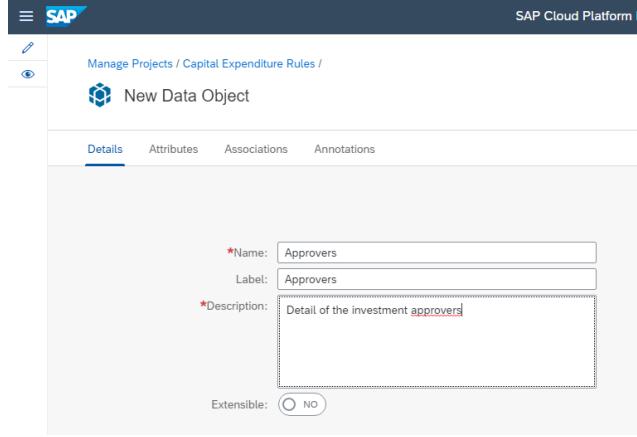
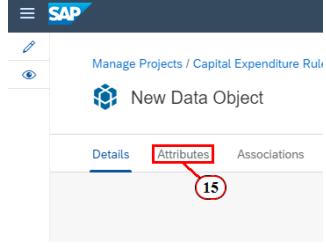
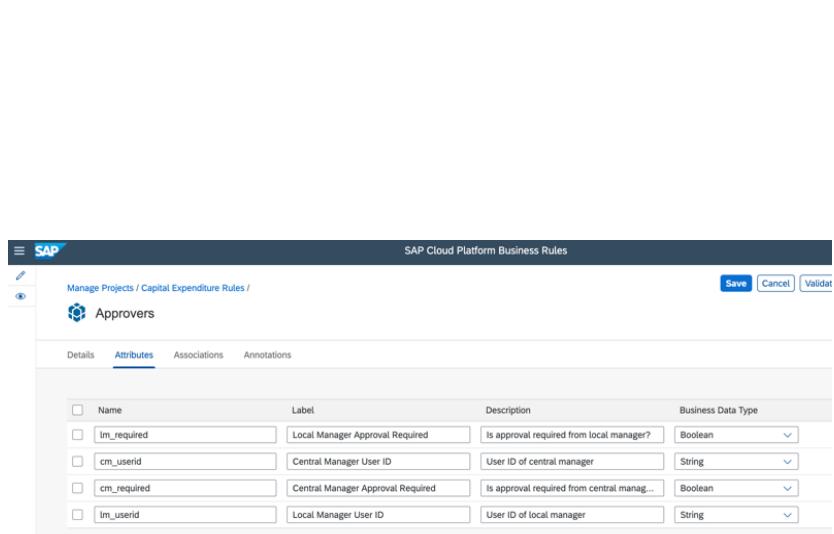
Explanation	Screenshot
<p>5. Enter <b>Business rules to determine approvers for new investments in capital expenditure process</b> in <b>Description</b> box.</p>	
<p>6. Click to select <b>2.0</b> as the <b>Expression Language</b>.</p>	
<p>7. Click <b>Save</b>.</p>	
<p>Your business rules project is created with the needed configurations.</p>	

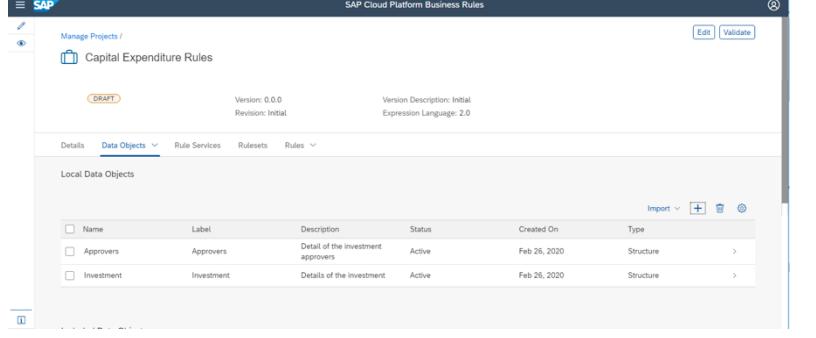
## CREATE DATA OBJECTS

Explanation	Screenshot
<p>8. Click Data Objects.</p>	
<p>9. Click + to create data object</p>	
<p>10. Enter <b>Investment</b> in the <b>Name</b> and the <b>Label</b> box.</p>	

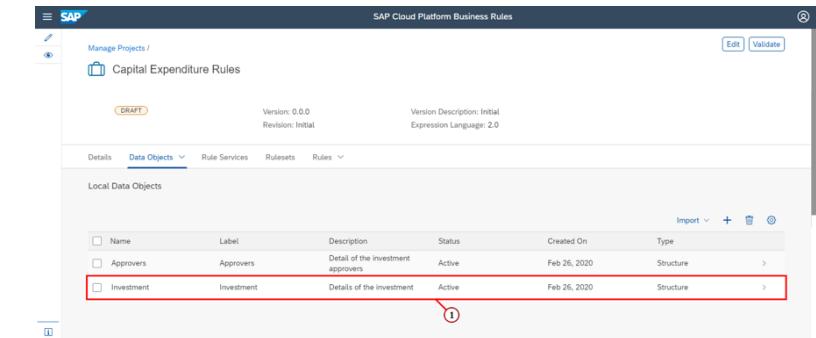
Explanation	Screenshot
<p>11. Enter <b>Details of the investment</b> in the <b>Description</b> box.</p>	
<p>12. Click <b>Attributes</b>.</p>	
<p>13. Click <b>+</b> to add new attributes</p>	
<p>14. Enter <b>Type</b> in the <b>Name</b> and <b>Label</b> box.      15. Enter <b>Type of investment</b> in the <b>Description</b> box.</p>	
<p>16. Click <b>+</b> to add attribute.</p>	

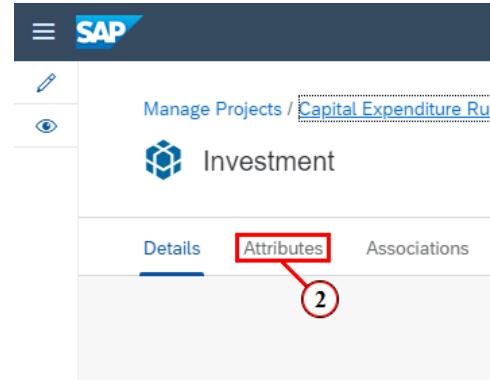
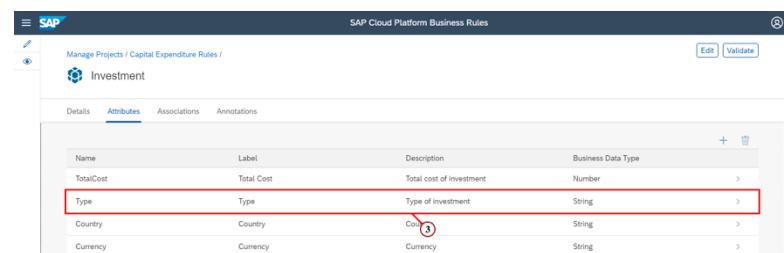
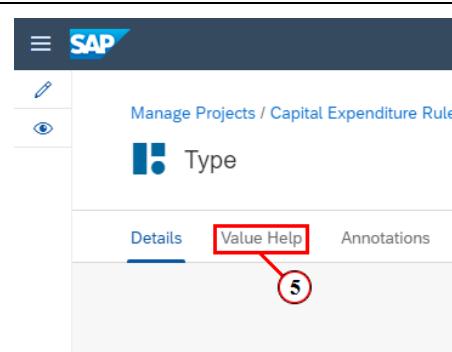
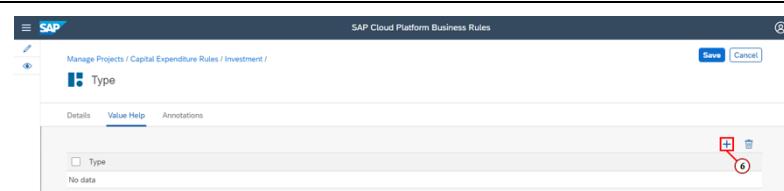
Explanation	Screenshot
<p>17. Repeat the steps to create more data object attributes with following details:</p> <p>Name: Currency Label: Currency Description: Currency Type: String</p> <p>Name: Country Label: Country Description: Country Type: String</p> <p>Name: TotalCost Label: Total Cost Description: Total cost of investment Type: Number</p>	
<p>18. Click <b>Activate</b>.</p>	
<p>19. Click <b>Capital Expenditure Rules</b>.</p>	
<p>20. Click <b>+</b> to new data object.</p> <p>Note: Ensure that you are in <b>Data Objects</b> tab.</p>	

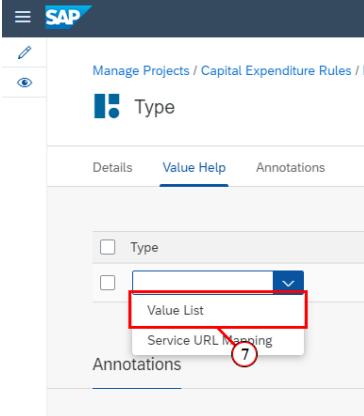
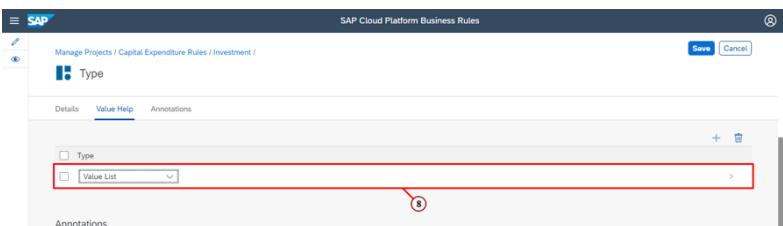
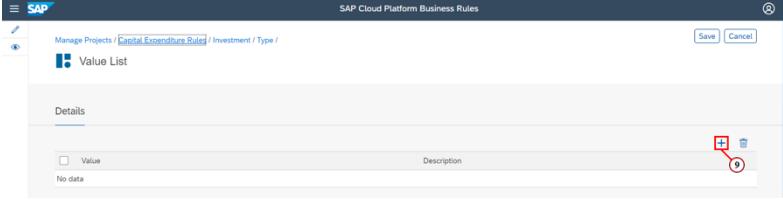
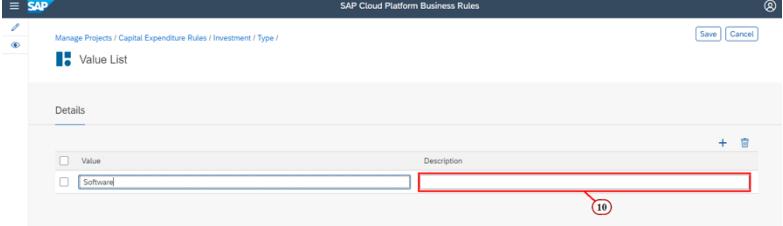
Explanation	Screenshot																				
<p>21. Enter <b>Approvers</b> in <b>Name</b> box.</p> <p>22. Enter <b>Approvers</b> in <b>Label</b> box.</p> <p>23. Enter <b>Detail of investment approvers</b> in <b>Description</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform interface for creating a new data object. The 'Details' tab is selected. The 'Name' field contains 'Approvers', the 'Label' field also contains 'Approvers', and the 'Description' field contains 'Detail of the investment approvers'. The 'Extensible' option is set to 'NO'.</p>																				
<p>24. Click <b>Attributes</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform interface for creating a new data object. The 'Attributes' tab is highlighted with a red box and circled with a red arrow. The number '15' is visible below the tabs.</p>																				
<p>25. Repeat the steps to create Approvers data object attributes with following details:</p> <p>Name: cm_userid Label: Central Manager User ID Description: User ID of central manager Type: String</p> <p>Name: lm_userid Label: Local Manager User ID Description: User ID of local manager Type: String</p> <p>Name: lm_required Label: Local Manager Approval Required Description: Is approval required from local manager? Type: Boolean</p> <p>Name: cm_required Label: Central Manager Approval Required Description: Is approval required from central manager? Type: Boolean</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface for the 'Approvers' data object. The 'Attributes' tab is selected. A table lists the attributes with their names, labels, descriptions, and business data types:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Business Data Type</th> </tr> </thead> <tbody> <tr> <td>lm_required</td> <td>Local Manager Approval Required</td> <td>Is approval required from local manager?</td> <td>Boolean</td> </tr> <tr> <td>cm_userid</td> <td>Central Manager User ID</td> <td>User ID of central manager</td> <td>String</td> </tr> <tr> <td>cm_required</td> <td>Central Manager Approval Required</td> <td>Is approval required from central manag...</td> <td>Boolean</td> </tr> <tr> <td>lm_userid</td> <td>Local Manager User ID</td> <td>User ID of local manager</td> <td>String</td> </tr> </tbody> </table>	Name	Label	Description	Business Data Type	lm_required	Local Manager Approval Required	Is approval required from local manager?	Boolean	cm_userid	Central Manager User ID	User ID of central manager	String	cm_required	Central Manager Approval Required	Is approval required from central manag...	Boolean	lm_userid	Local Manager User ID	User ID of local manager	String
Name	Label	Description	Business Data Type																		
lm_required	Local Manager Approval Required	Is approval required from local manager?	Boolean																		
cm_userid	Central Manager User ID	User ID of central manager	String																		
cm_required	Central Manager Approval Required	Is approval required from central manag...	Boolean																		
lm_userid	Local Manager User ID	User ID of local manager	String																		

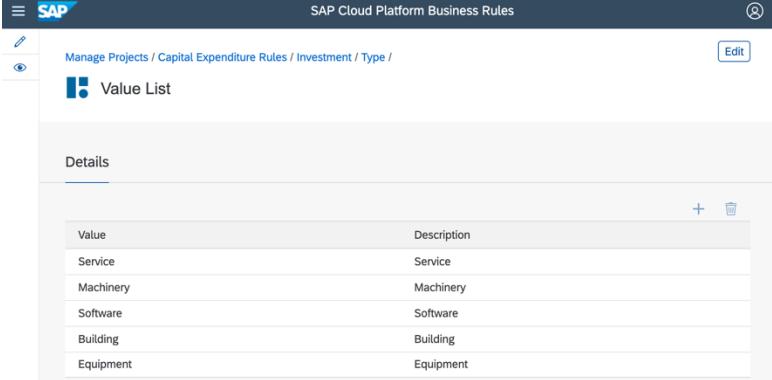
Explanation	Screenshot
26. Click <b>Activate</b> .	
27. Click <b>Capital Expenditure Rules</b> .	
<p>You have created and configured data objects in business rules project.</p> <p><b>Investment</b> data object will be used as <i>Input</i> and <b>Approver</b> data object will be used as <i>Output</i> in the rule service.</p> <p>These data object &amp; their attributes will be used while modelling rule expressions.</p>	

## CONFIGURE VALUE HELP IN DATA OBJECT

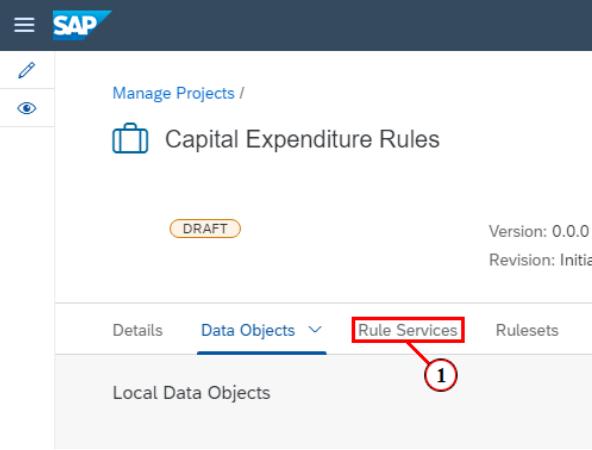
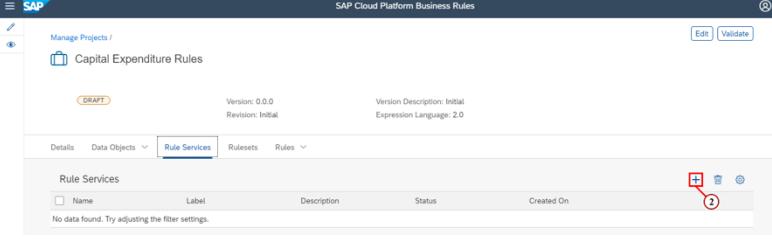
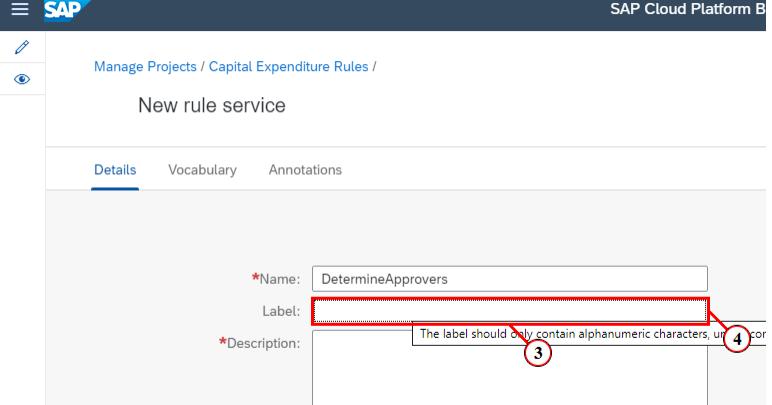
Explanation	Screenshot
28. Click to open <b>Investment</b> data object.	

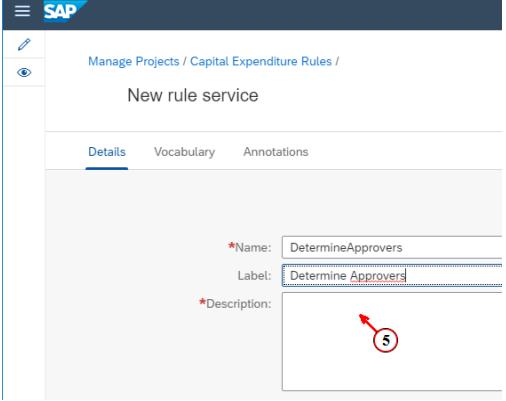
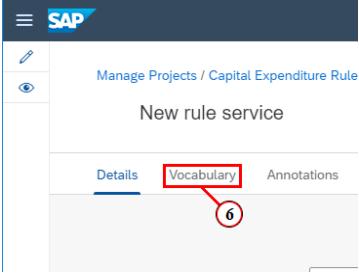
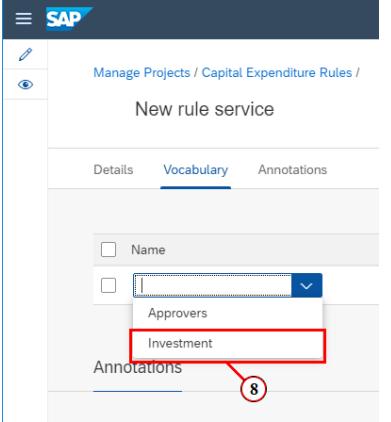
Explanation	Screenshot
29. Click <b>Attributes</b> to add attributes to the data object.	
30. Click to open <b>Type</b> attribute.	
31. Click <b>Edit</b> .	
32. Click <b>Value Help</b> .	
33. Click <b>+</b> to add value help	

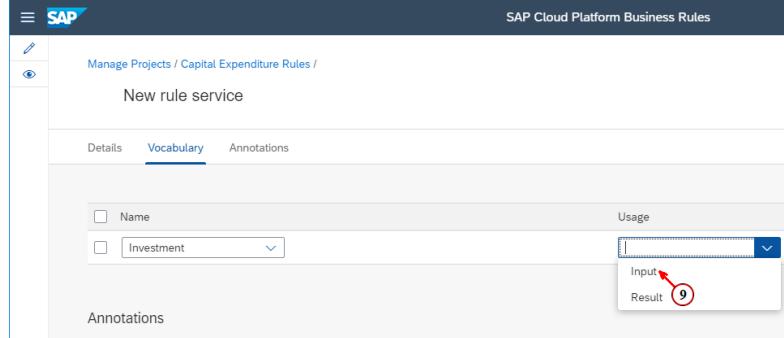
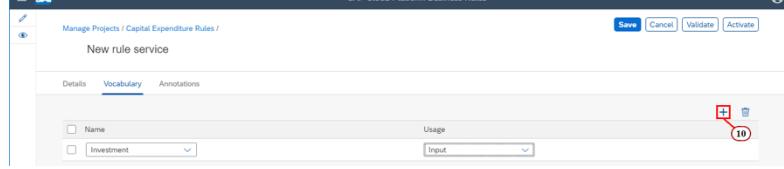
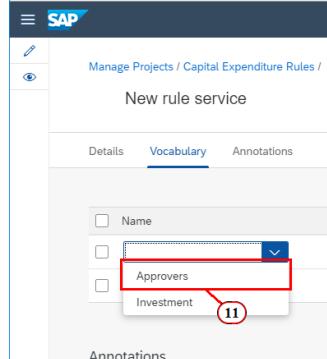
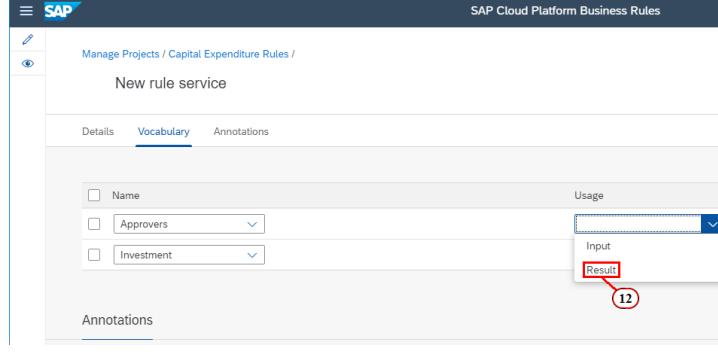
Explanation	Screenshot
<p>34. Click <b>Value List</b> from <b>Type</b>.</p>	
<p>Note: there are two kinds of value help  (a) Static and (b) Dynamic. Dynamic <b>value help</b> can be created with Service <b>URL Mapping</b> and <b>Static</b> can be created with <b>Value List</b> type. In dynamic value you can connect any backend system and make a service call. In this exercise, you will create static value help where you will manually create value-description pair.</p>	
<p>35. Click to on the <b>Value List</b> row.</p>	
<p>36. Click  to add values to the value list.</p>	

Explanation	Screenshot																						
<p>38. Repeat the steps above to add few more values:</p> <table border="1"> <thead> <tr> <th>Value</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Machinery</td><td>Machinery</td></tr> <tr> <td>Building</td><td>Building</td></tr> <tr> <td>Equipment</td><td>Equipment</td></tr> <tr> <td>Service</td><td>Service</td></tr> </tbody> </table>	Value	Description	Machinery	Machinery	Building	Building	Equipment	Equipment	Service	Service	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface for managing investment types. A table titled 'Value List' displays the following data:</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Service</td> <td>Service</td> </tr> <tr> <td>Machinery</td> <td>Machinery</td> </tr> <tr> <td>Software</td> <td>Software</td> </tr> <tr> <td>Building</td> <td>Building</td> </tr> <tr> <td>Equipment</td> <td>Equipment</td> </tr> </tbody> </table>	Value	Description	Service	Service	Machinery	Machinery	Software	Software	Building	Building	Equipment	Equipment
Value	Description																						
Machinery	Machinery																						
Building	Building																						
Equipment	Equipment																						
Service	Service																						
Value	Description																						
Service	Service																						
Machinery	Machinery																						
Software	Software																						
Building	Building																						
Equipment	Equipment																						
<p>39. Click <b>Save</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface after saving the value list. The 'Save' button is highlighted with a red box and circled with a red number 11.</p>																						
<p>40. Click <b>Investment</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface for managing projects. The 'Investment' link is highlighted with a red box and circled with a red number 12.</p>																						
<p>41. Click <b>Edit</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface for managing investment details. The 'Edit' button is highlighted with a red box and circled with a red number 13.</p>																						
<p>42. Click <b>Activate</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface for managing investment details. The 'Activate' button is highlighted with a red box and circled with a red number 14.</p>																						
<p>43. Click <b>Capital Expenditure Rules</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface for managing capital expenditure rules. The 'Capital Expenditure Rules' link is highlighted with a red box and circled with a red number 15.</p>																						

## CREATE RULE SERVICE

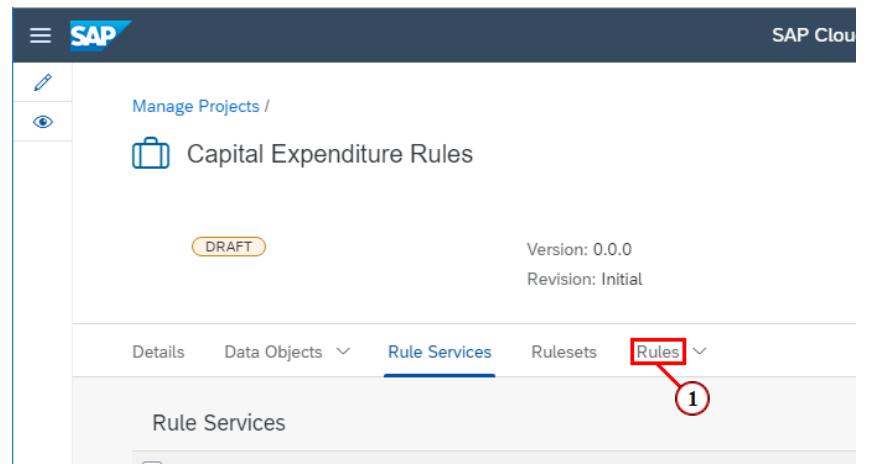
Explanation	Screenshot
<p>44. Click Rule Services.</p>	
<p>45. Click + to add new rule service</p>	
<p>53. Click to enter <b>DetermineApprovers</b> in Name box.</p> <p>54. Click to enter <b>Determine Approvers</b> in Label box.</p>	

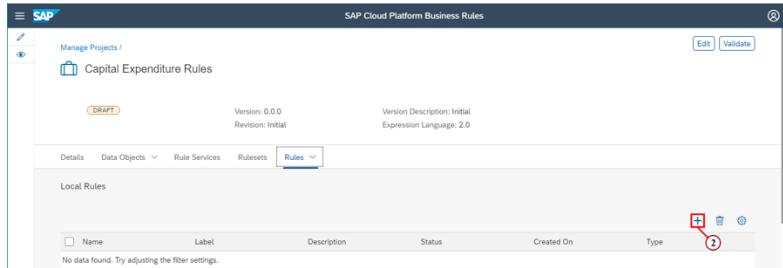
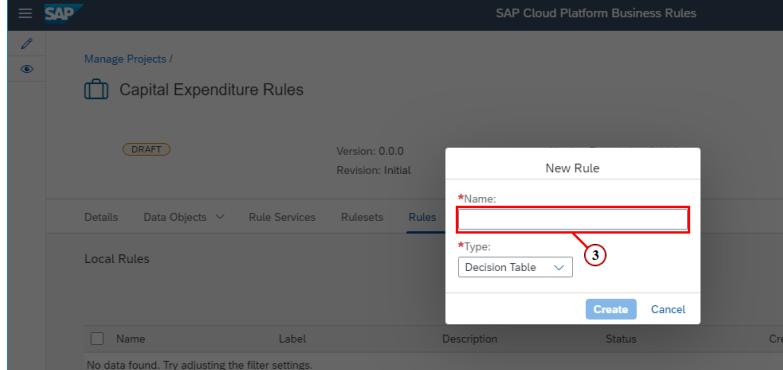
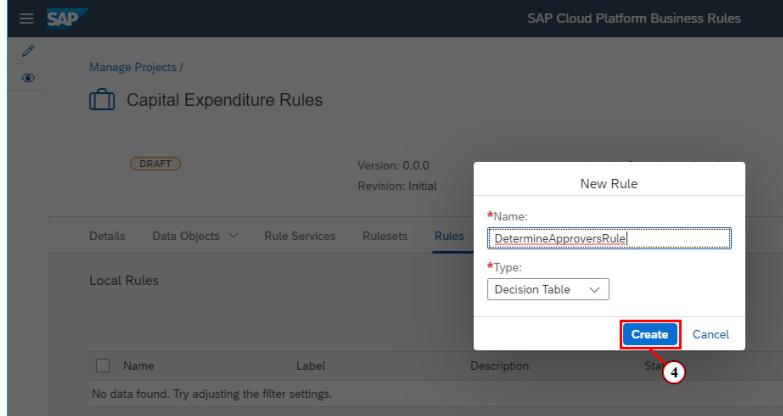
Explanation	Screenshot
<p>55. Click to enter <b>Rule service</b> to determine approvers for new investment in <b>Description</b> box.</p>	
<p>56. Click <b>Vocabulary</b>.</p>	
<p>57. Click <b>+</b> to add rule service vocabulary.</p>	
<p>58. Click to select <b>Investment</b>.</p>	

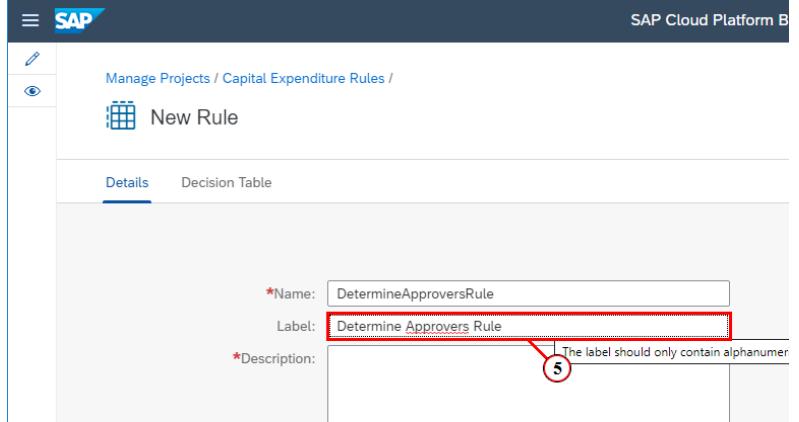
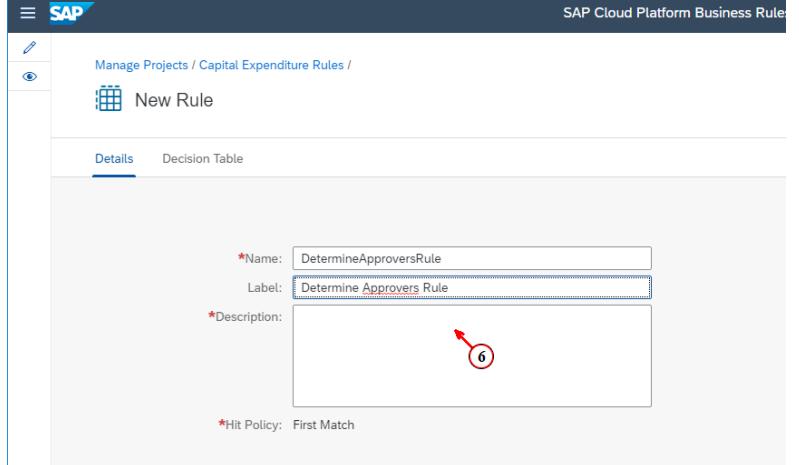
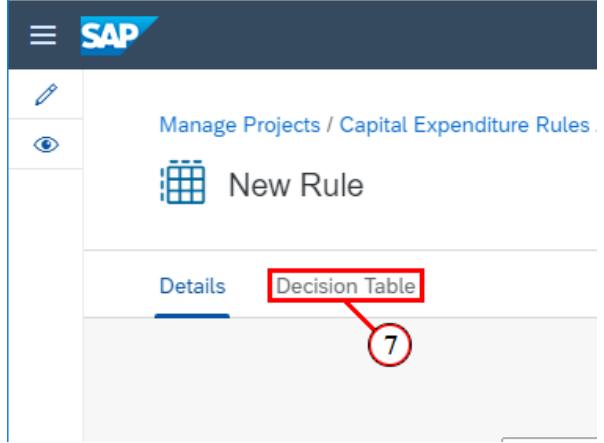
Explanation	Screenshot
<p>59. From <b>Usage</b>, select <b>Input</b>.</p>	
<p>60. Click  to add another rule service vocabulary.</p>	
<p>61. Click to select <b>Approvers</b>.</p>	
<p>62. From <b>Usage</b>, select <b>Result</b></p>	
<p>63. Click <b>Activate</b></p>	

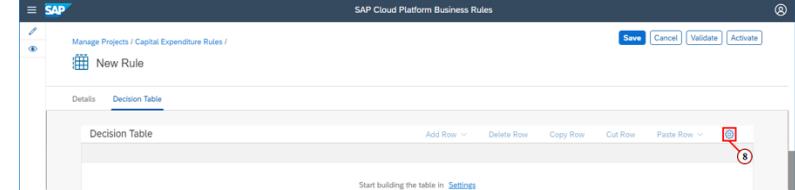
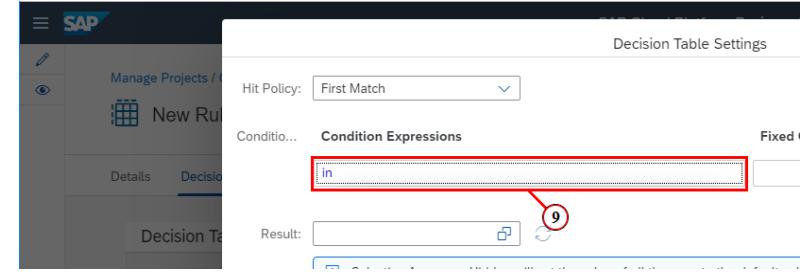
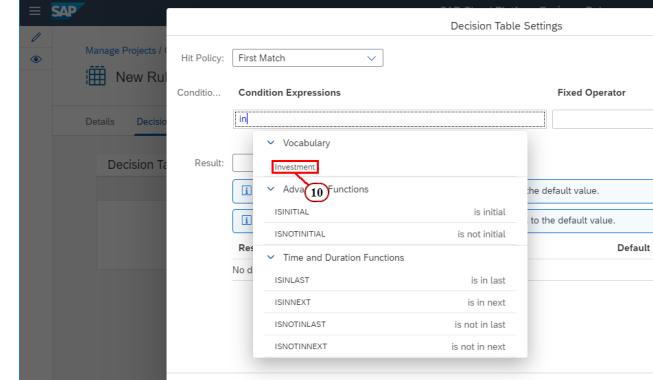
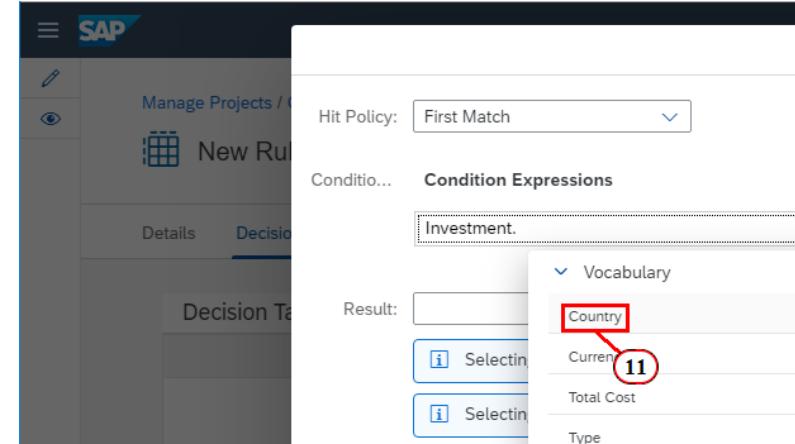
Explanation	Screenshot
<p>64. Click <a href="#">Capital Expenditure Rules</a></p>	

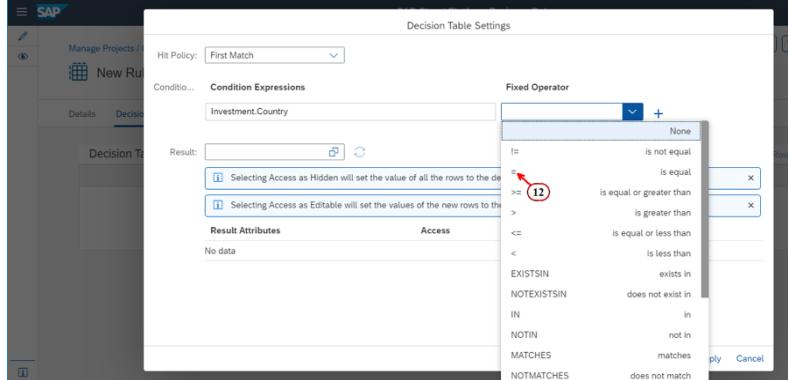
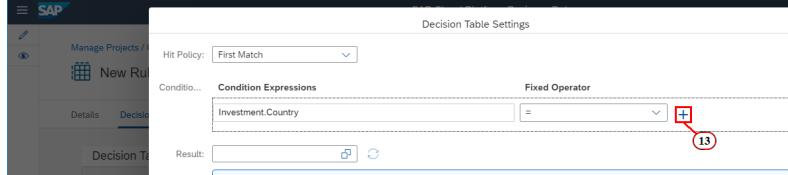
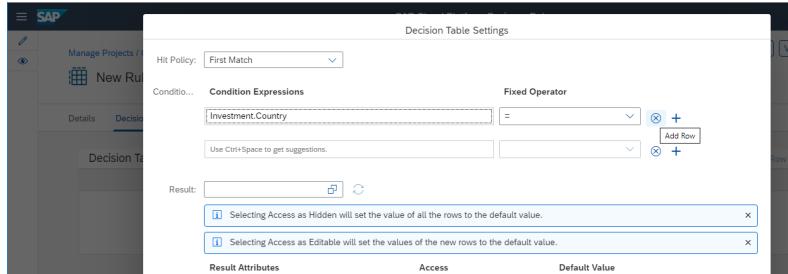
## CREATE DECISION TABLE RULE

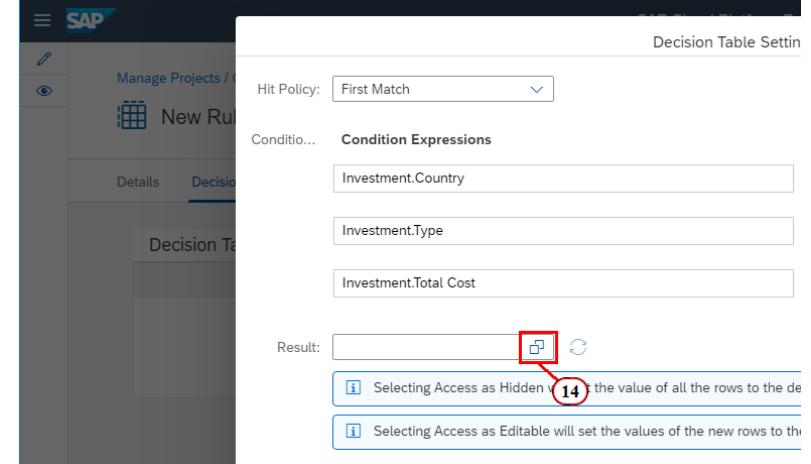
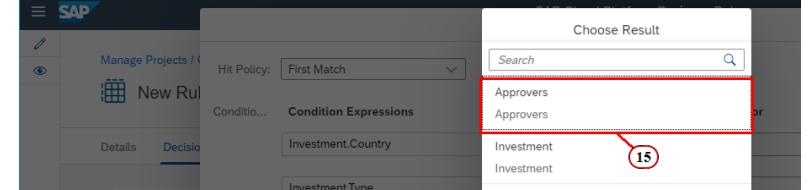
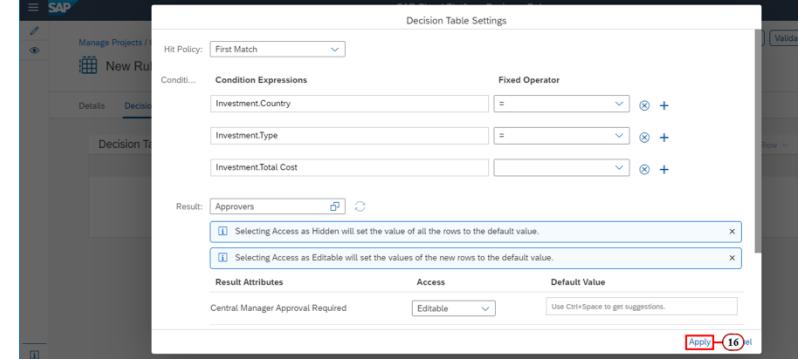
Explanation	Screenshot
<p>65. Click <a href="#">Rules</a>.</p>	

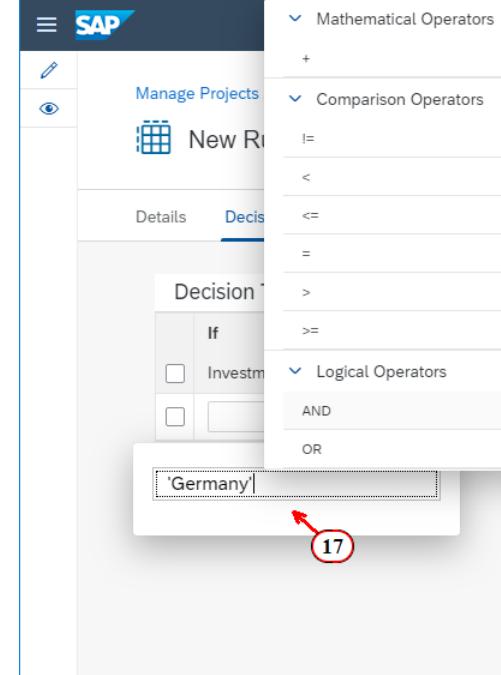
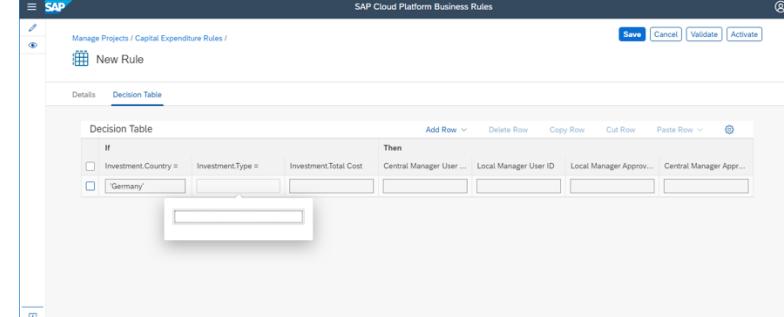
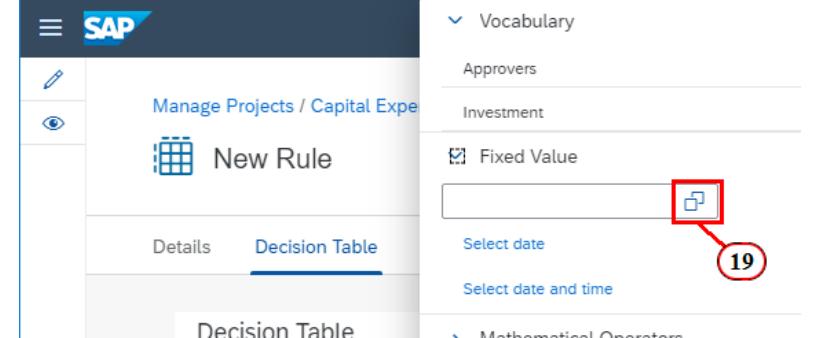
Explanation	Screenshot
<p>66. Click  to create rule.</p>	
<p>67. Click to enter <b>DetermineApproversRule</b> in Name box.</p>	
<p>68. Click .</p>	

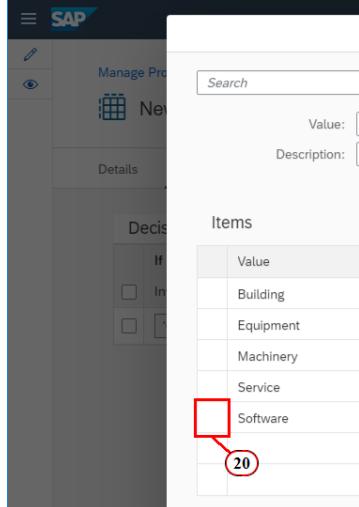
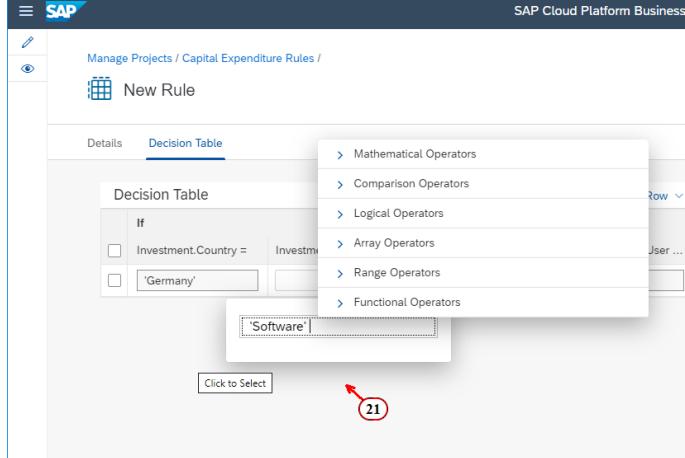
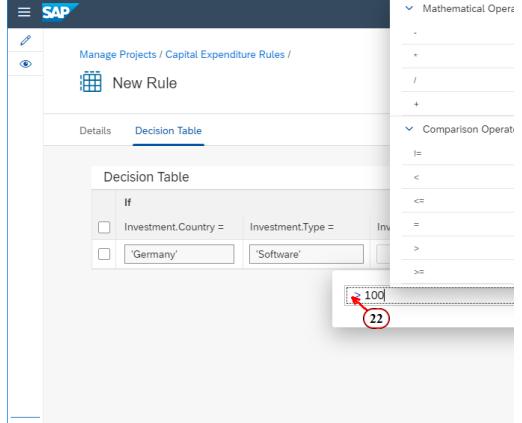
Explanation	Screenshot
<p>69. Click and enter <b>Determine Approvers Rule</b> in Label box.</p>	 <p>SAP Cloud Platform B</p> <p>Manage Projects / Capital Expenditure Rules / New Rule</p> <p>Details Decision Table</p> <p>*Name: DetermineApproversRule</p> <p>Label: Determine Approvers Rule <span style="border: 1px solid red; padding: 2px;">The label should only contain alphanumeric</span></p> <p>*Description:</p>
<p>70. Click to enter <b>Rules to determine approvers for the new investments based on type, country and total cost of the investment</b> in Description box.</p>	 <p>SAP Cloud Platform Business Rule</p> <p>Manage Projects / Capital Expenditure Rules / New Rule</p> <p>Details Decision Table</p> <p>*Name: DetermineApproversRule</p> <p>Label: Determine Approvers Rule</p> <p>*Description: <span style="border: 1px solid red; padding: 2px;">*Hit Policy: First Match</span></p>
<p>71. Click <b>Decision Table</b>.</p>	 <p>Manage Projects / Capital Expenditure Rules</p> <p>New Rule</p> <p>Details Decision Table</p>

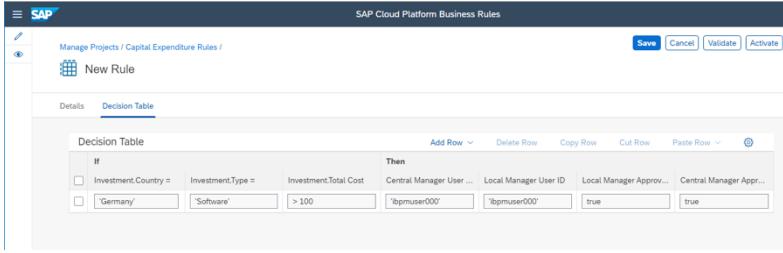
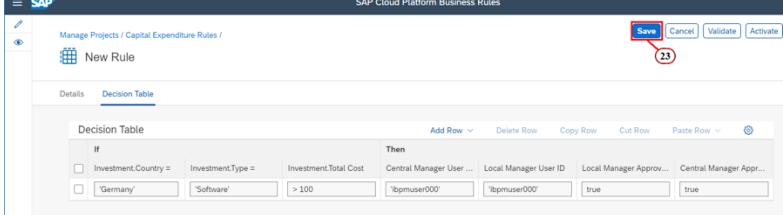
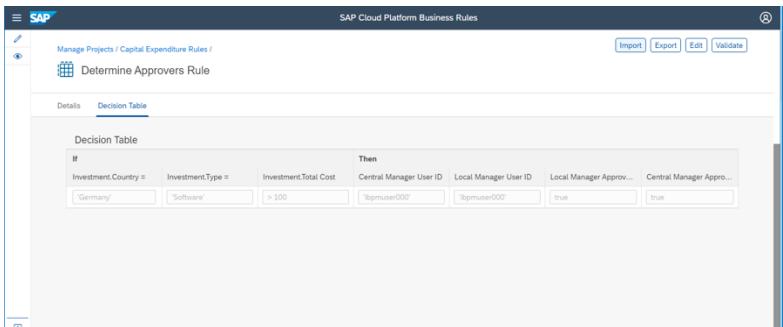
Explanation	Screenshot
<p>72. Click  to configure condition and result of the rule.</p>	
<p>Note: As you start typing in the <b>Condition Expression</b> box, you will get in-place context help with the list of Vocabulary, Operators and Functions.</p> <p>73. Click and enter <b>in</b> the condition expression box.</p> <p>74. From the in-place context sensitive help options, select <b>Investment &gt;&gt; Country</b></p>	
<p>75. Click <b>Investment</b>.</p>	
<p>76. Click <b>Country</b>.</p>	

Explanation	Screenshot						
<p>77. In <b>Fixed Operator</b> drop down, click <b>= is equal</b> operator.</p>							
<p>78. Click <b>+</b> to add new condition expression.</p>							
<p>79. Repeat the steps above to add few more condition expressions as following:</p> <table border="1"> <thead> <tr> <th>Condition Expression</th><th>Fixed Operator</th></tr> </thead> <tbody> <tr> <td>Investment.Type</td><td><b>=</b></td></tr> <tr> <td>Investment.Total Cost</td><td></td></tr> </tbody> </table>	Condition Expression	Fixed Operator	Investment.Type	<b>=</b>	Investment.Total Cost		
Condition Expression	Fixed Operator						
Investment.Type	<b>=</b>						
Investment.Total Cost							

Explanation	Screenshot
<p>80. Click  to select <b>Result</b> data object.</p>	
<p>81. Select or Double-click on <b>Approvers</b>.</p>	
<p>Note: You will notice <b>Access</b> column as the result properties. When you set access as hidden, the respective column will not be seen during rule authoring in decision table.</p>	

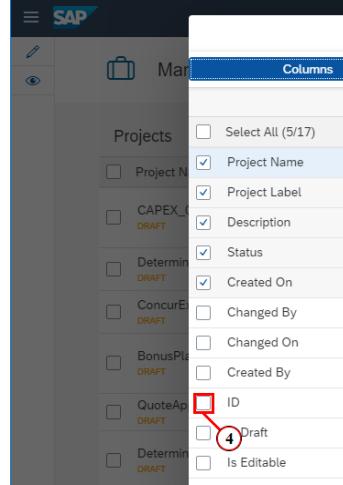
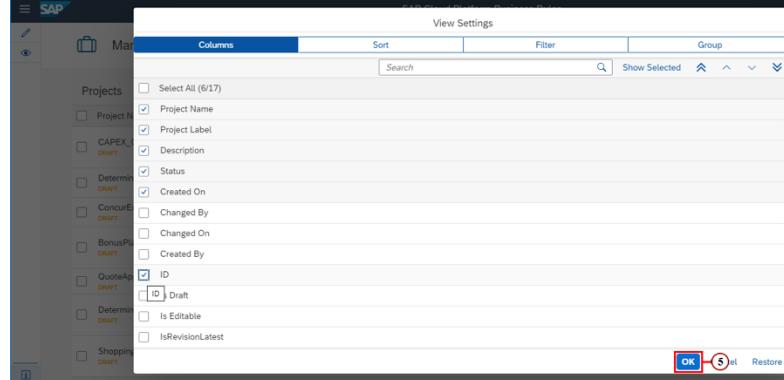
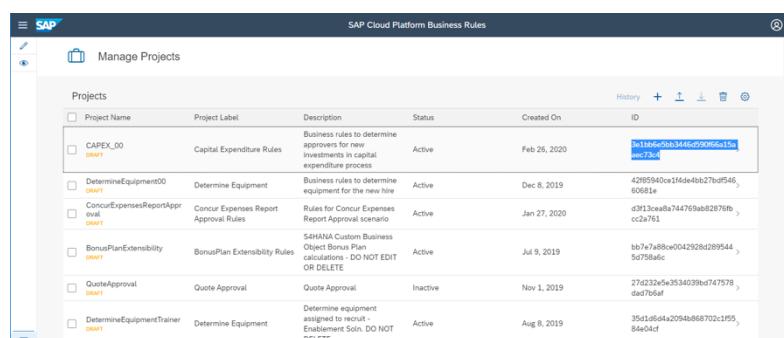
Explanation	Screenshot
<p>83. Click on the input field of <b>Investment.Country</b> column and enter 'Germany'.</p> <p>After you have finished typing, press <b>Enter</b> key to confirm or click outside the input field.</p>	
<p>Note: In this expression, you will choose the value from the value help defined for this attribute.</p> <p>84. Please press <b>Ctrl+ Space</b> or press any key.</p>	
<p>85. Expand <b>Fixed Value</b> and click  to select value help.</p>	

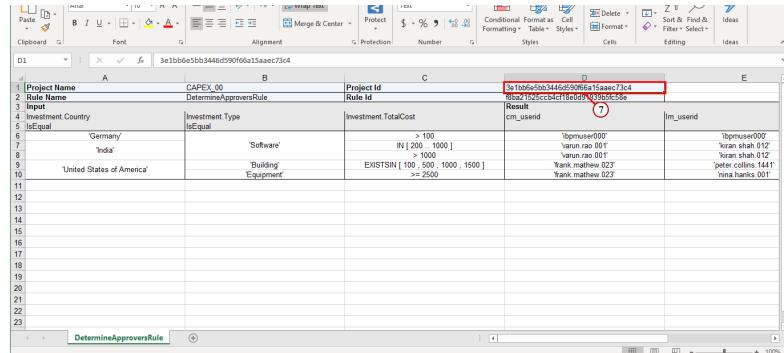
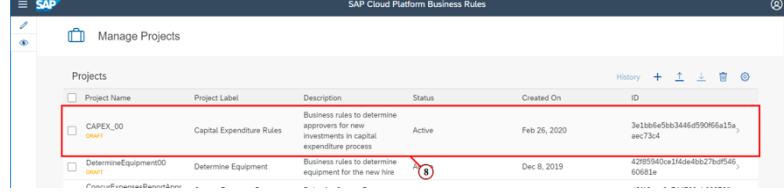
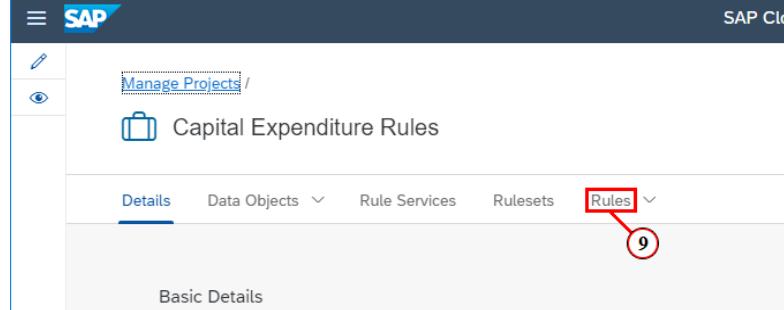
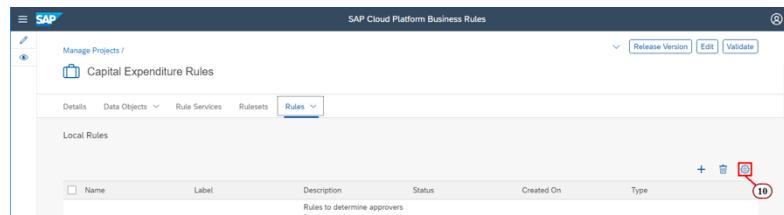
Explanation	Screenshot
<p>86. Click to select <b>Software</b> from the value help.</p>	
<p>87. Click <b>Enter</b> to confirm or click outside the input field.</p>	
<p>88. Click to enter <b>&gt; 100</b>  89. Press <b>Enter</b> to confirm.</p>	

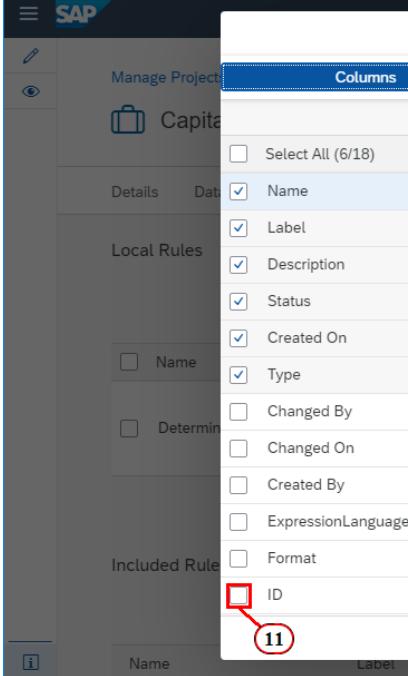
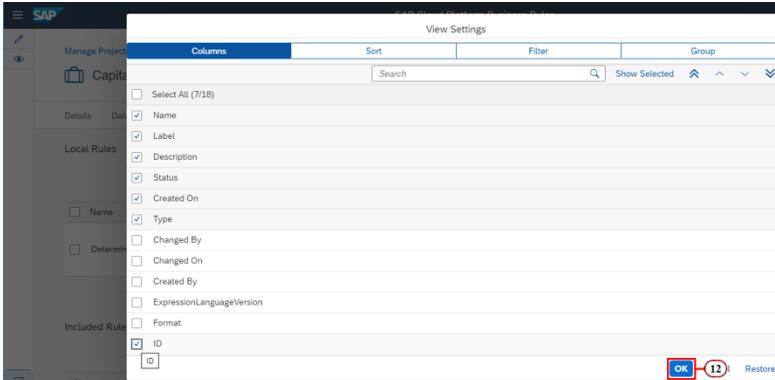
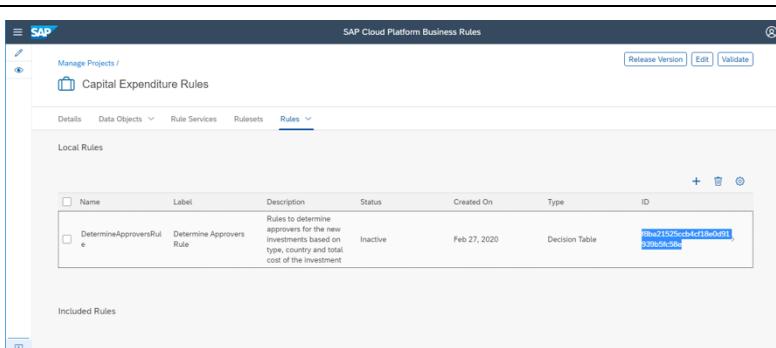
Explanation	Screenshot										
<p>90. Similarly, enter the following expression values for the respective result column:</p> <table border="1"> <thead> <tr> <th>Result Column</th><th>Expression Value</th></tr> </thead> <tbody> <tr> <td>Central Manager User ID</td><td>'your trial user number'</td></tr> <tr> <td>Local Manager User ID</td><td>'your trial user number'</td></tr> <tr> <td>Local Manager Approval Required</td><td>true</td></tr> <tr> <td>Central Manager Approval Required</td><td>true</td></tr> </tbody> </table>	Result Column	Expression Value	Central Manager User ID	'your trial user number'	Local Manager User ID	'your trial user number'	Local Manager Approval Required	true	Central Manager Approval Required	true	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A decision table is displayed with one row. The 'If' section contains conditions: 'Investment.Country = Germany' and 'Investment.Type = Software'. The 'Then' section contains actions: 'Central Manager User ID' set to 'ibpmuser000', 'Local Manager User ID' set to 'ibpmuser000', 'Local Manager Approval Required' set to 'true', and 'Central Manager Approval Required' set to 'true'. The 'Save' button is visible at the top right.</p>
Result Column	Expression Value										
Central Manager User ID	'your trial user number'										
Local Manager User ID	'your trial user number'										
Local Manager Approval Required	true										
Central Manager Approval Required	true										
<p>23. Click <b>Save</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface after saving. The 'Save' button is highlighted with a red box. The decision table row remains the same as in the previous step.</p>										
<p>You have created a decision table-based rule with condition and result columns. You have added a row to the decision table and used in-place context sensitive help to add expressions to the cell values. Now, in next chapter you will use Microsoft Excel to import the data in the decision table.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface with the saved rule. The 'Determine Approvers Rule' is listed under 'Manage Projects / Capital Expenditure Rules /'. The decision table row is identical to the previous screenshots.</p>										

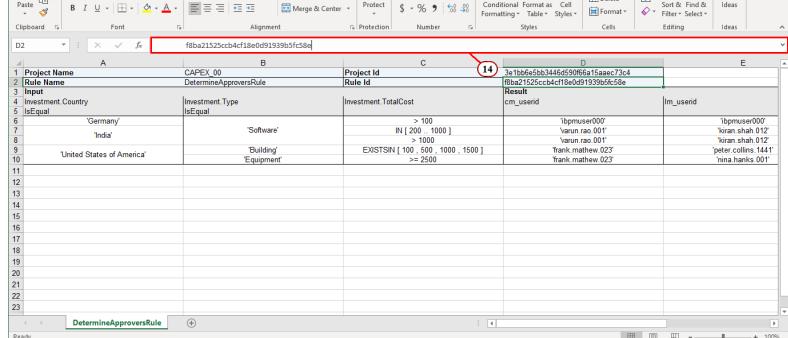
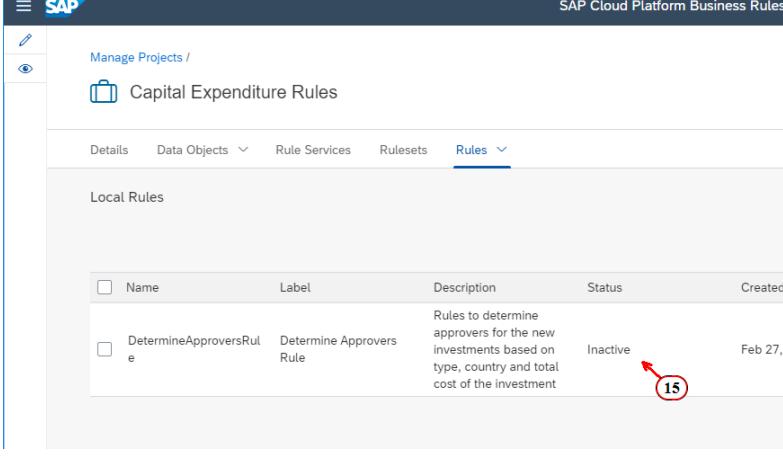
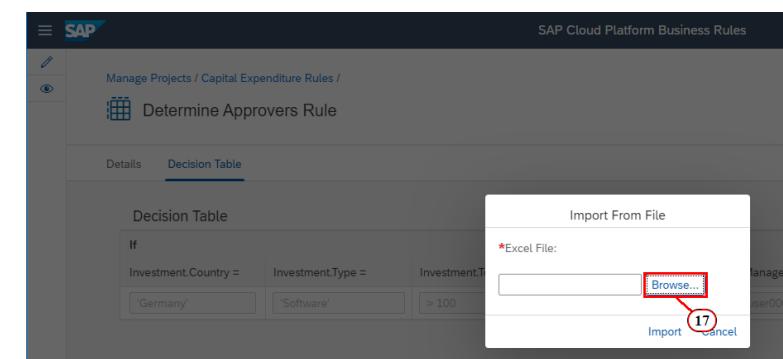
### IMPORT DECISION TABLE FROM MICROSOFT EXCEL

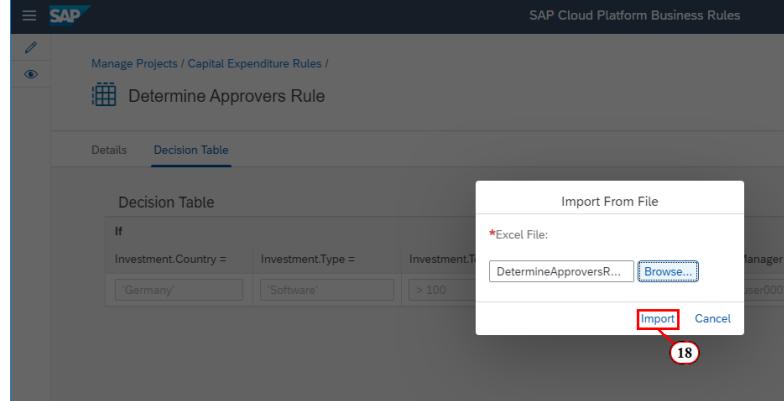
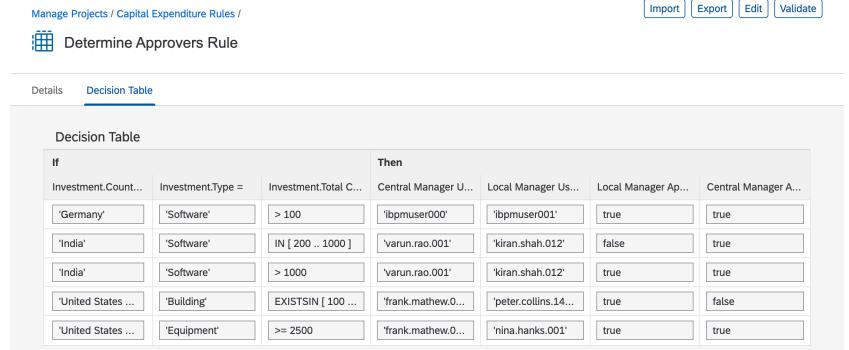
Explanation	Screenshot
<p>91. Download the <b>DetermineApproversRule</b> excel in the same folder in GitHub.</p> <p>92. Open the excel and update <b>Project Name</b>, <b>Project ID</b> and <b>Rule ID</b> in the available excel sheet as shown in steps below.</p> <p>93. Update project name with your rules project name like CAPEX_00.</p>	
<p>Now, to update the Project ID and Rule ID you have to go back to the <b>Manage Rule Projects</b> application.</p> <p>94. Navigate back to projects. 95. Click <a href="#">Manage Projects</a>.</p>	
<p>96. Click  to add new display column to get ID of the project.</p>	

Explanation	Screenshot
<p>97. Click <input type="checkbox"/> to select ID column.</p>	
<p>98. Click .</p>	
<p>99. Select and press <b>Ctrl+C</b> or <b>Command+C</b> to copy.</p>	

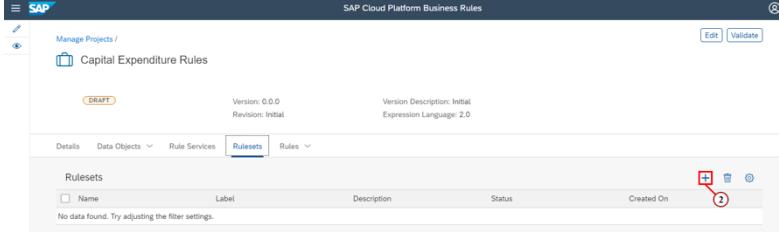
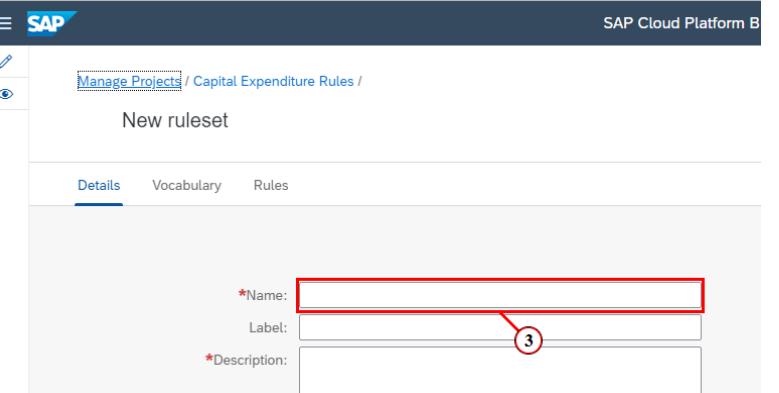
Explanation	Screenshot
<p>100. Paste the copied Project ID.</p> <p>Note: ensure that there are no leading or lagging space while you do the copy &amp; paste.</p>	
<p>101. Click to open project.</p>	
<p>102. Click <b>Rules</b>.</p>	
<p>103. Click  to add new display column to get ID of the rule.</p>	

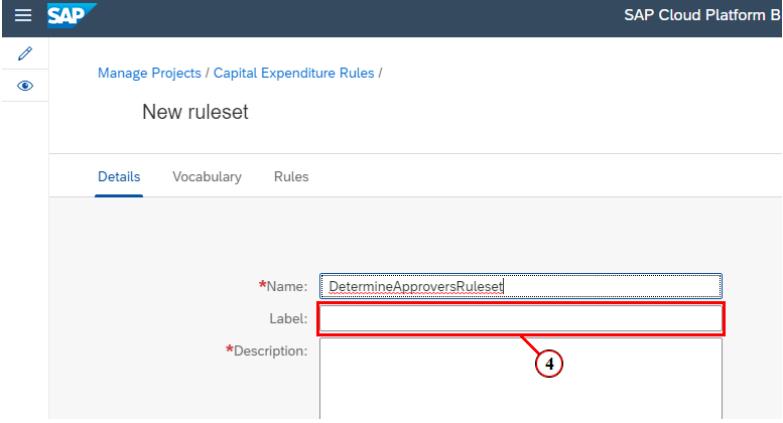
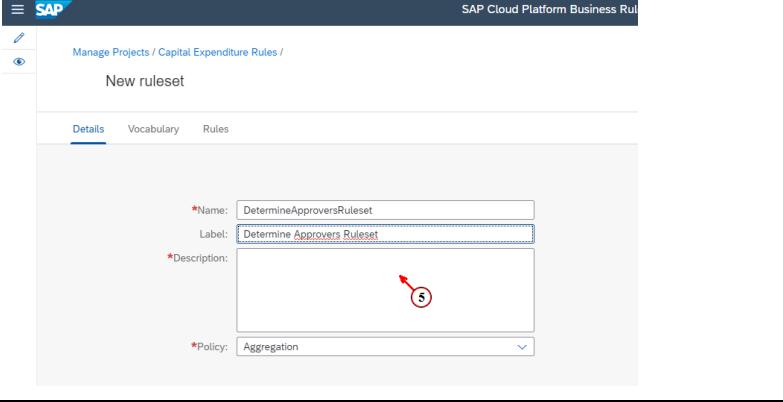
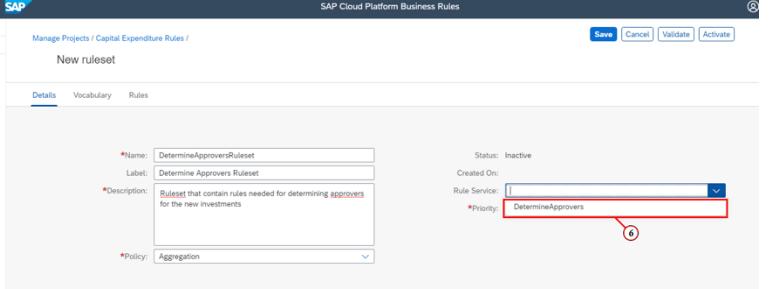
Explanation	Screenshot
104. Click <input type="checkbox"/> of ID option.	
105. Click  .	
106. Select and press <b>Ctrl+C</b> or <b>Command+C</b> to copy.	

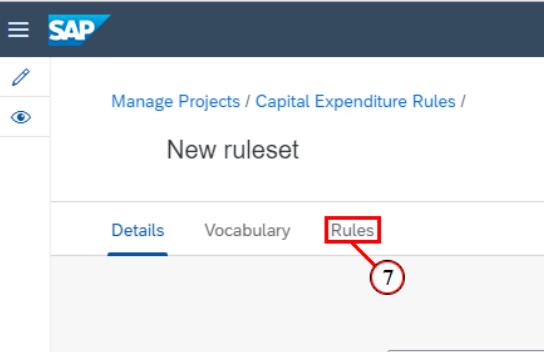
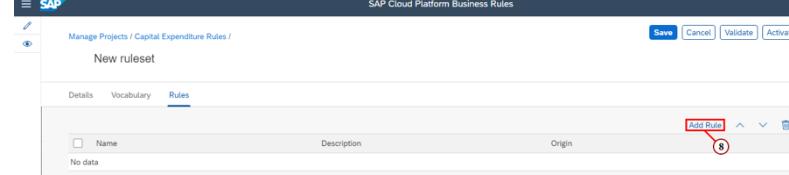
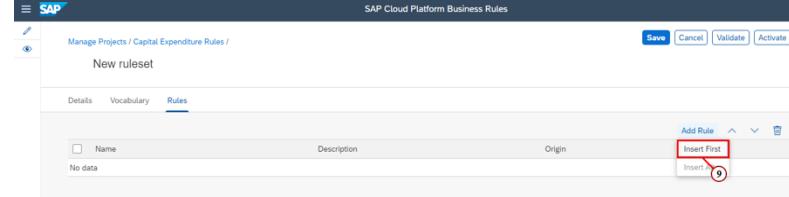
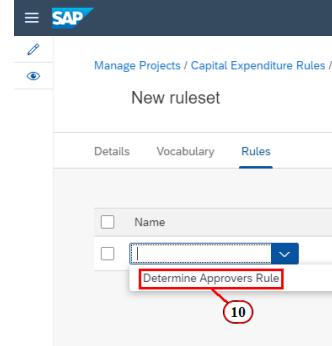
Explanation	Screenshot
<p><b>107. Paste the Rule ID</b></p> <p>Note: ensure that there are no leading or trailing spaces while you do the copy paste</p> <p><b>108. Also, change the cm_userid and lm_userid of the first row (line number 6) to your trial username.</b></p>	
<p><b>109. Click to open the rule.</b></p>	
<p><b>110. Click Import.</b></p>	
<p><b>111. Click Browse... and select the excel sheet updated in steps above.</b></p>	

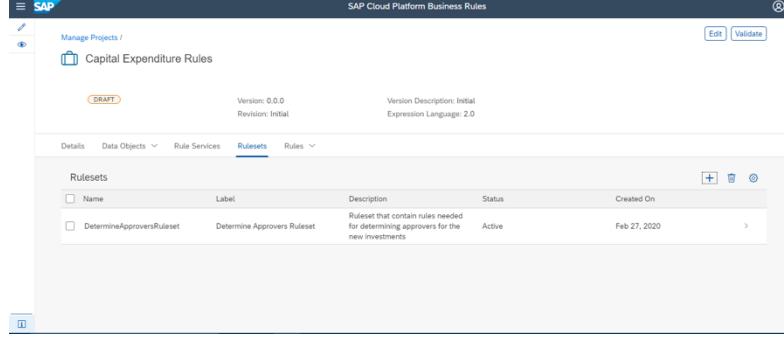
Explanation	Screenshot
112. Click <b>Import</b> .	
You will have the rows imported in your decision table.	
113. Click <b>Edit</b> .	
114. Click <b>Activate</b> .	
115. Click <b>Capital Expenditure Rules</b> .	

## CREATE RULESET

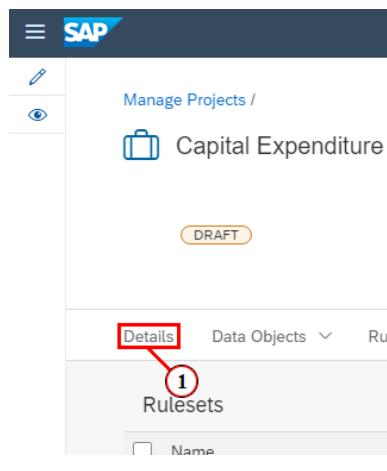
Explanation	Screenshot
<p>116. Click <b>Rulesets</b>.</p>	
<p>117. Click  to create ruleset.</p>	
<p>118. Click to enter <b>DetermineApproversRuleset</b> in Name box.</p>	

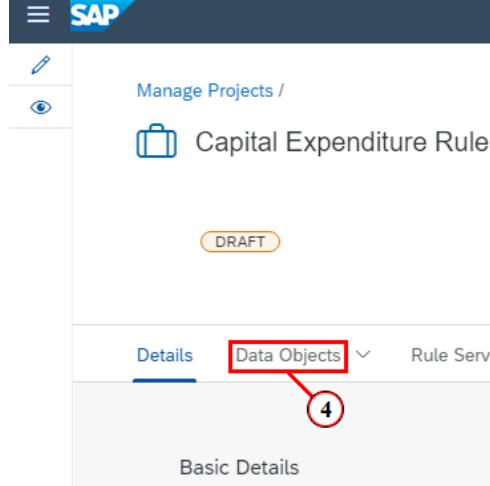
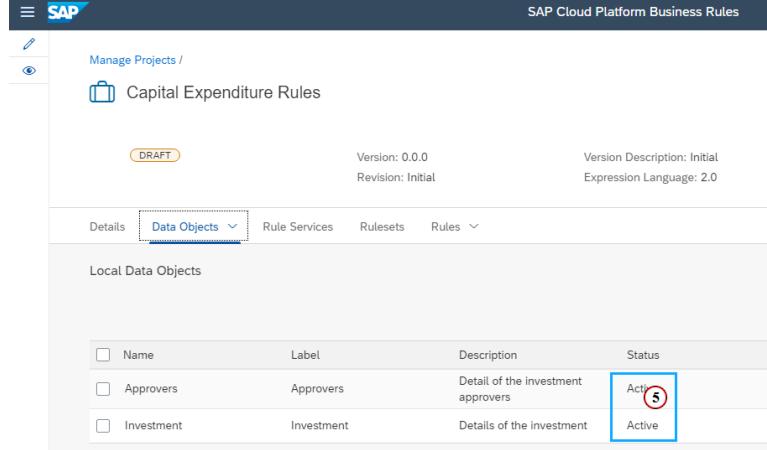
Explanation	Screenshot
<p>119. Click to enter <b>Determine Approvers Ruleset</b> in <b>Label</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the 'Details' tab, there are three fields: 'Name' (DetermineApproversRuleset), 'Label' (Determine Approvers Ruleset), and 'Description' (Ruleset that contain rules needed for determining approvers for the new investments). A red box highlights the 'Label' field, and a red circle with the number 4 points to it.</p>
<p>120. Click to enter <b>Ruleset that contain rules needed for determining approvers for the new investments</b> in <b>Description</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the 'Details' tab, there are three fields: 'Name' (DetermineApproversRuleset), 'Label' (Determine Approvers Ruleset), and 'Description' (Ruleset that contain rules needed for determining approvers for the new investments). A red box highlights the 'Description' field, and a red circle with the number 5 points to it.</p>
<p>121. Click to select <b>DetermineApprovers</b> as <b>Rule Service</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the 'Details' tab, there are three fields: 'Name' (DetermineApproversRuleset), 'Label' (Determine Approvers Ruleset), and 'Description' (Ruleset that contain rules needed for determining approvers for the new investments). On the right side, there are status and rule service settings. A red box highlights the 'Rule Service' dropdown, and a red circle with the number 6 points to it.</p>

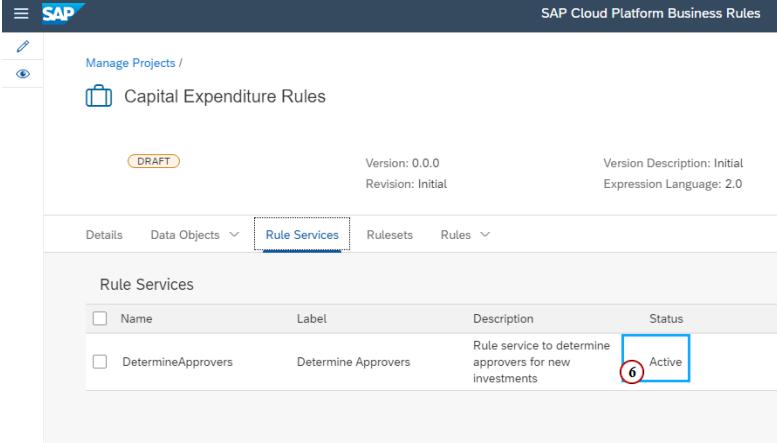
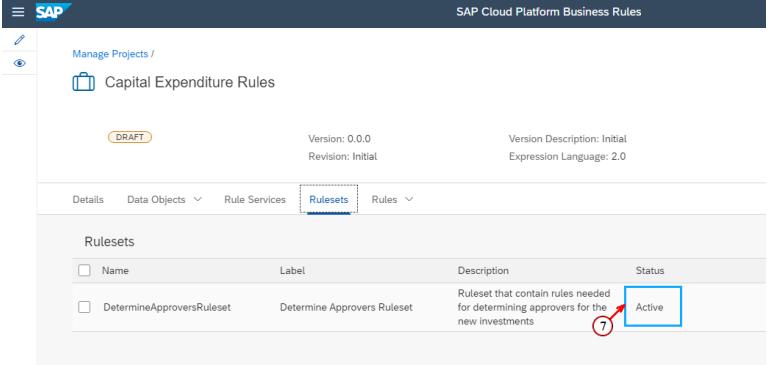
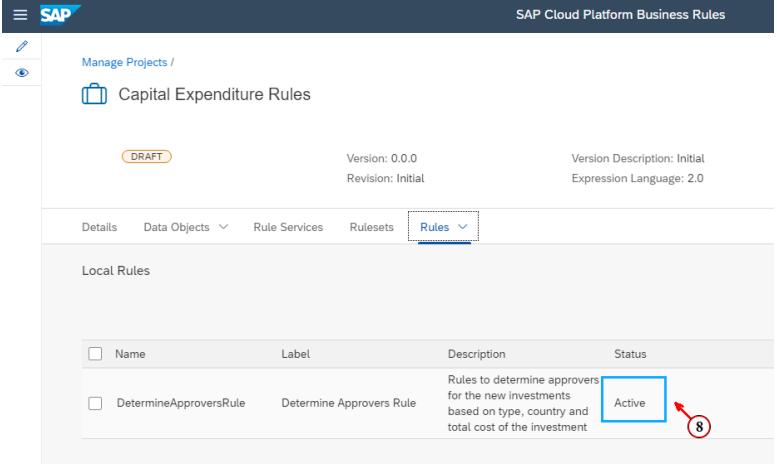
Explanation	Screenshot
122. Click <b>Rules</b> .	
123. Click <b>Add Rule</b> .	
124. Click <b>Insert First</b> .	
125. Click to select <b>Determine Approvers Rule</b> .	
126. Click <b>Activate</b> .	

Explanation	Screenshot
<p>127. Click <a href="#">Capital Expenditure Rules</a>.</p>	
<p>You have created the ruleset, associated it with rule service and added the rule. Ruleset is a collection of rules of similar output.</p>	

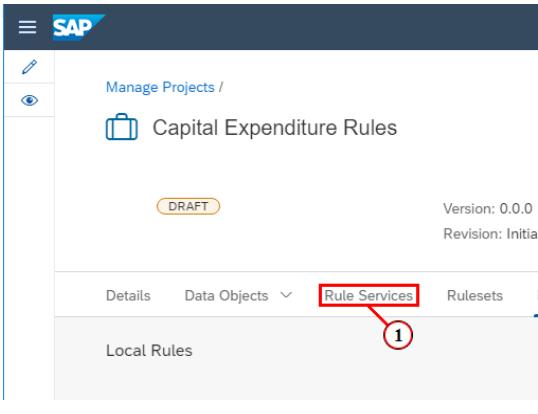
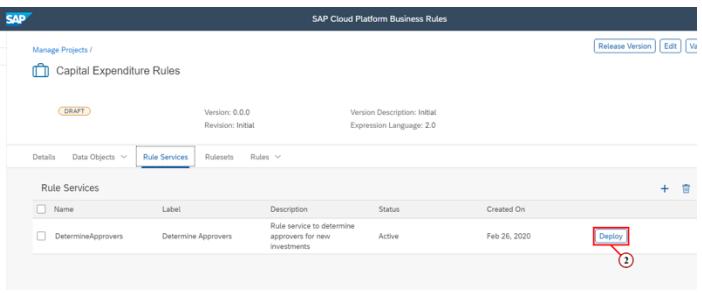
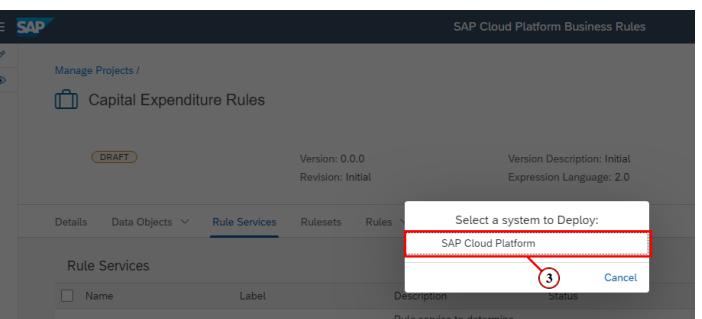
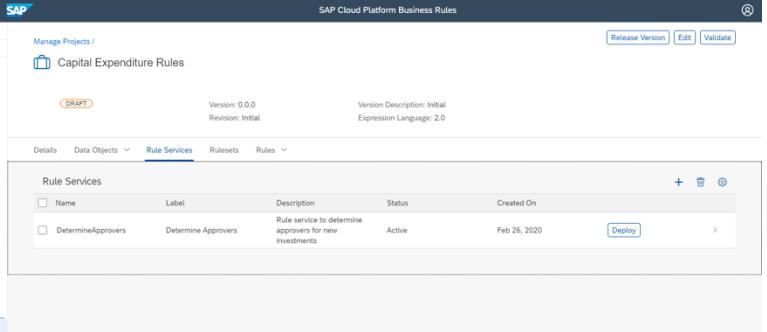
## ACTIVATE RULES PROJECT

Explanation	Screenshot
<p>Before you deploy the rule service, all the rule entity models have to be in activated state. In this chapter, you will go through all the models to ensure that they are activated.</p> <p>128. Click <a href="#">Details</a>.</p>	
<p>129. Click <a href="#">Edit</a>.</p>	

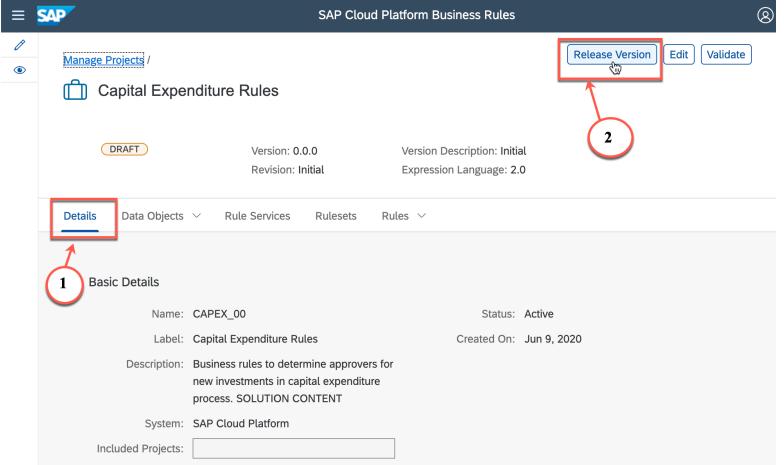
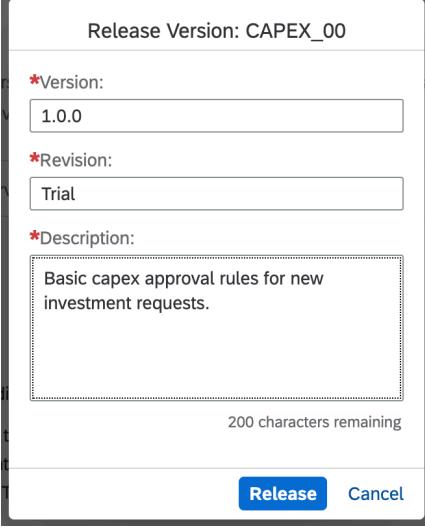
Explanation	Screenshot												
130. Click <b>Activate</b> .													
131. Click <b>Data Objects</b> .													
132. Check if all the data objects are in <b>Active</b> state.	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Approvers</td> <td>Approvers</td> <td>Detail of the investment approvers</td> <td>Active</td> </tr> <tr> <td>Investment</td> <td>Investment</td> <td>Details of the investment</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	Approvers	Approvers	Detail of the investment approvers	Active	Investment	Investment	Details of the investment	Active
Name	Label	Description	Status										
Approvers	Approvers	Detail of the investment approvers	Active										
Investment	Investment	Details of the investment	Active										

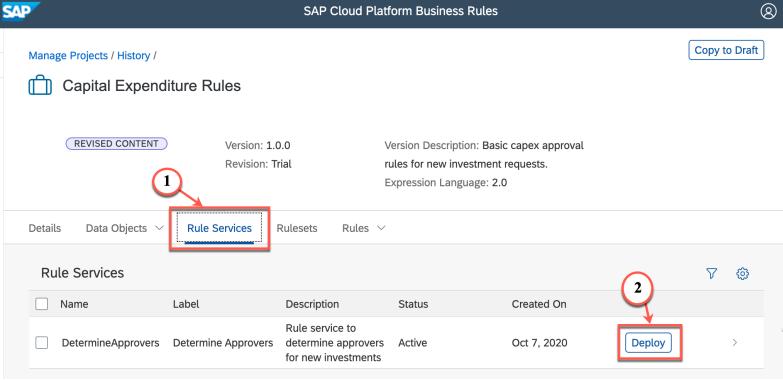
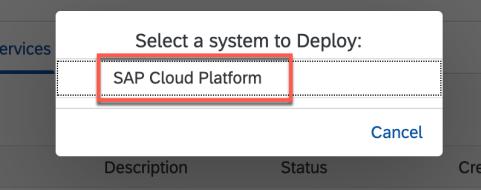
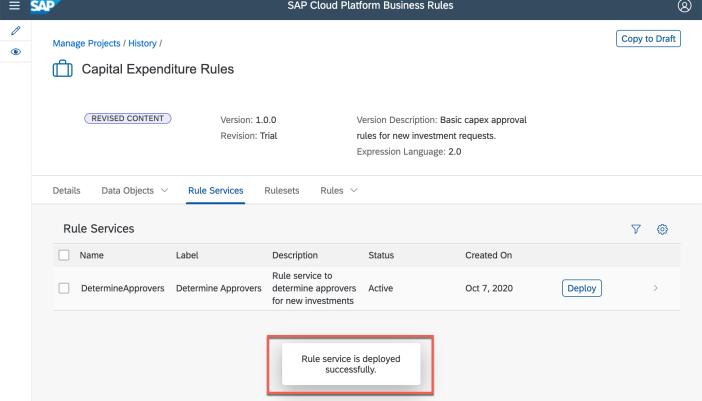
Explanation	Screenshot								
<p>133. Check if all the rule services are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>DetermineApprovers</td> <td>Determine Approvers</td> <td>Rule service to determine approvers for new investments</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApprovers	Determine Approvers	Rule service to determine approvers for new investments	Active
Name	Label	Description	Status						
DetermineApprovers	Determine Approvers	Rule service to determine approvers for new investments	Active						
<p>134. Check if all rulesets are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>DetermineApproversRuleset</td> <td>Determine Approvers Ruleset</td> <td>Ruleset that contain rules needed for determining approvers for the new investments</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contain rules needed for determining approvers for the new investments	Active
Name	Label	Description	Status						
DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contain rules needed for determining approvers for the new investments	Active						
<p>135. Check if all rules are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>DetermineApproversRule</td> <td>Determine Approvers Rule</td> <td>Rules to determine approvers for the new investments based on type, country and total cost of the investment</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApproversRule	Determine Approvers Rule	Rules to determine approvers for the new investments based on type, country and total cost of the investment	Active
Name	Label	Description	Status						
DetermineApproversRule	Determine Approvers Rule	Rules to determine approvers for the new investments based on type, country and total cost of the investment	Active						

## DEPLOY RULE SERVICE

Explanation	Screenshot
136. Click Rule Services.	
137. Click Deploy.	
138. Click SAP Cloud Platform to deploy the rule service.	
139. After the ruleset is deployed successfully, you will see the message. Now, the rule service can be consumed via the REST APIs	

## CREATE VERSION

Explanation	Screenshot
<p>140. Click on <b>Details</b> tab</p> <p>141. Click <b>Release Version</b> to create a new version of the rules project.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The 'Details' tab is selected. In the top right, there is a 'Release Version' button with a red box and a circled '2' above it, indicating the next step. Other buttons like 'Edit' and 'Validate' are also visible.</p>
<p>142. Enter the following in the Release Version pup-up:</p> <p>Version: 1.0.0 Revision: Trial Description: Basic capex approval rules for new investment requests.</p> <p>143. Click <b>Release</b></p>	 <p>The screenshot shows a 'Release Version' dialog box. It contains three fields: 'Version' (1.0.0), 'Revision' (Trial), and 'Description' (Basic capex approval rules for new investment requests). Below the description field is a note '200 characters remaining'. At the bottom are 'Release' and 'Cancel' buttons.</p>
<p>144. To view the version created, <b>navigate back</b> to main page by clicking on <b>Manage Projects</b> link on top-left corner of the screen</p> <p>145. Click the <b>checkbox</b> of the business rules project for which you created the version.</p> <p>146. Click <b>History</b>.</p>	 <p>The screenshot shows the 'Manage Projects' page. A row for the 'CAPEX_00' project has a red box and a circled '1' on its checkbox. In the top right, there is a 'History' button with a red box and a circled '2' above it, indicating the next step. Other buttons like '+', '^', 'v', and trash can are also visible.</p>

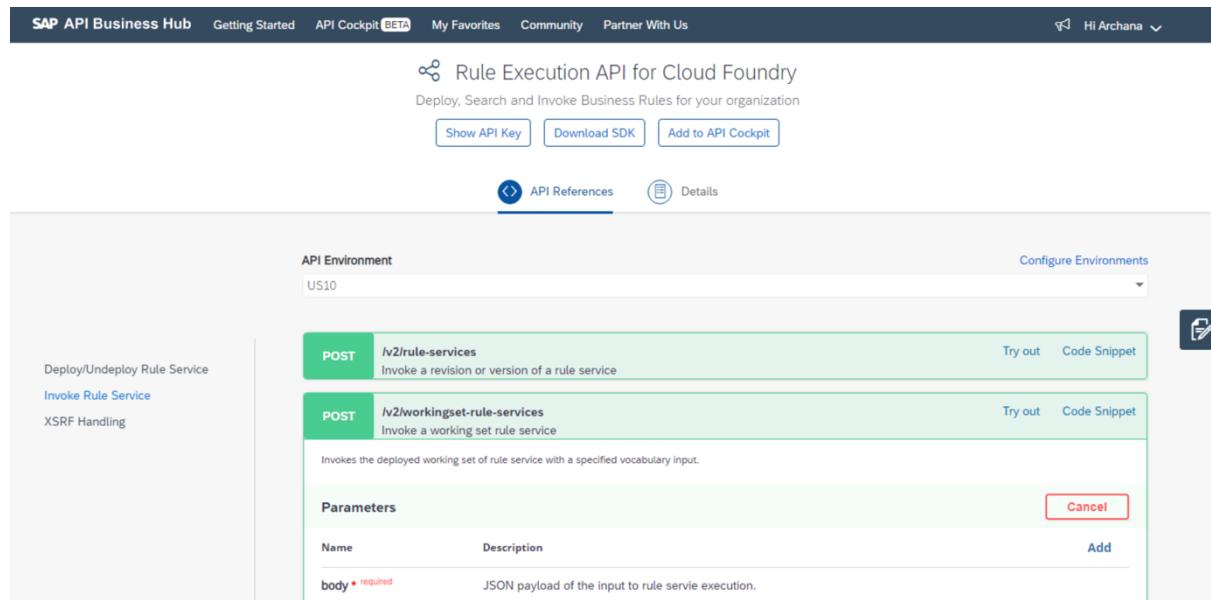
Explanation	Screenshot										
<p>You will see all the versions of the rule Project created here.</p> <p>147. Click to navigate into version 1.0.0</p>	 <table border="1"> <thead> <tr> <th>Version</th> <th>Revision</th> <th>Description</th> <th>Changed By</th> <th>Changed On</th> </tr> </thead> <tbody> <tr> <td>1.0.0</td> <td>Trial</td> <td>Basic capex approval rules for new investment requests.</td> <td>Archana</td> <td>Oct 7, 2020</td> </tr> </tbody> </table>	Version	Revision	Description	Changed By	Changed On	1.0.0	Trial	Basic capex approval rules for new investment requests.	Archana	Oct 7, 2020
Version	Revision	Description	Changed By	Changed On							
1.0.0	Trial	Basic capex approval rules for new investment requests.	Archana	Oct 7, 2020							
<p>148. Click <b>Rule Services</b> tab.</p> <p>149. Click <b>Deploy</b>.</p>											
<p>150. Click <b>SAP Cloud Platform</b> to deploy the rule service.</p>											
<p>151. After the rule service is deployed successfully, you will see the message.</p> <p>Now, the rule service can be consumed via the REST APIs</p>											

## TEST BUSINESS RULE

### OVERVIEW

Estimated time: 15 minutes

In the following exercise you will learn the basics of testing business rules invocation from APIs available in SAP API Business Hub.



The screenshot shows the SAP API Business Hub interface. At the top, there is a navigation bar with links for SAP API Business Hub, Getting Started, API Cockpit (BETA), My Favorites, Community, and Partner With Us. On the right, it says "Hi Archana". Below the navigation bar, there is a section titled "Rule Execution API for Cloud Foundry" with a sub-section "Deploy, Search and Invoke Business Rules for your organization". There are three buttons: "Show API Key", "Download SDK", and "Add to API Cockpit". Below this, there are two tabs: "API References" (which is selected) and "Details". The main content area is titled "API Environment" and shows "US10" as the selected environment. There are two API endpoints listed:

Method	Endpoint	Description	Try out	Code Snippet
POST	/v2/rule-services	Invoke a revision or version of a rule service	Try out	Code Snippet
POST	/v2/workingset-rule-services	Invoke a working set rule service	Try out	Code Snippet

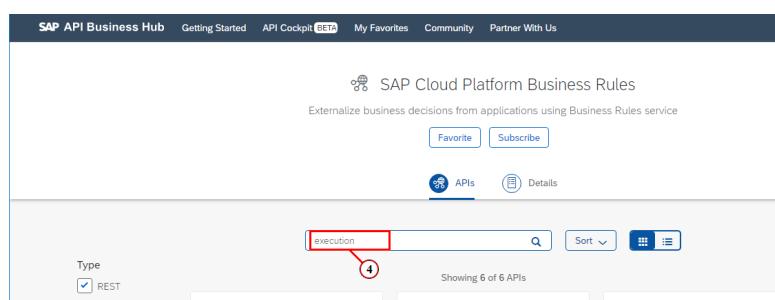
For the first endpoint, there is a note: "Invokes the deployed working set of rule service with a specified vocabulary input." Below the endpoints, there is a "Parameters" section with a "Cancel" button and an "Add" button. A note under "Parameters" says: "body \* required JSON payload of the input to rule service execution."

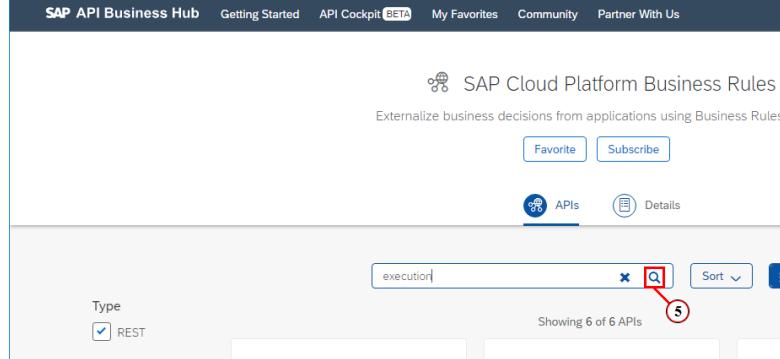
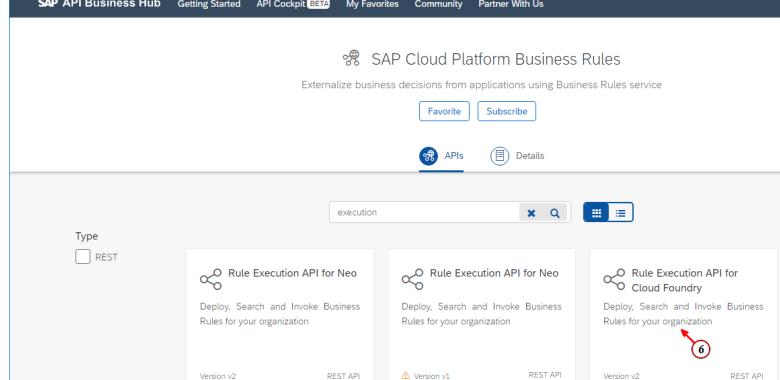
### Exercise Description

In this exercise you will do the following:

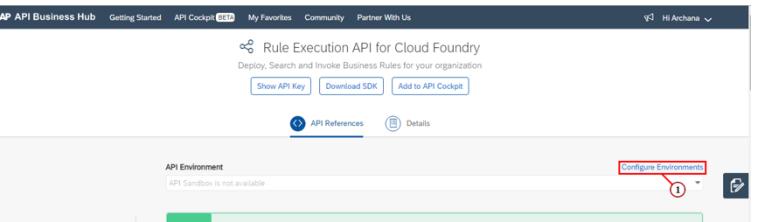
- Discover Business Rules API in SAP API Business Hub
- Configure Cloud Foundry Test Environment
- Invoke Business Rules

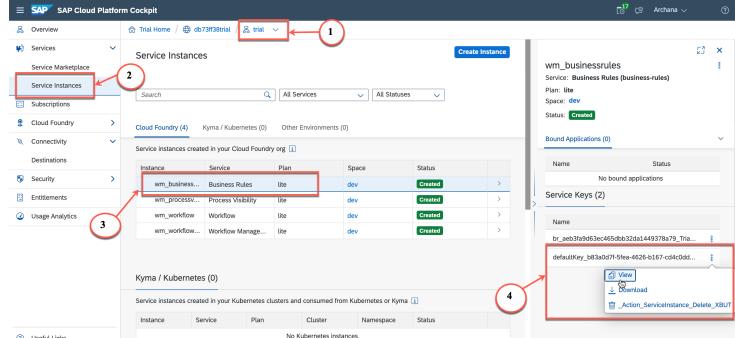
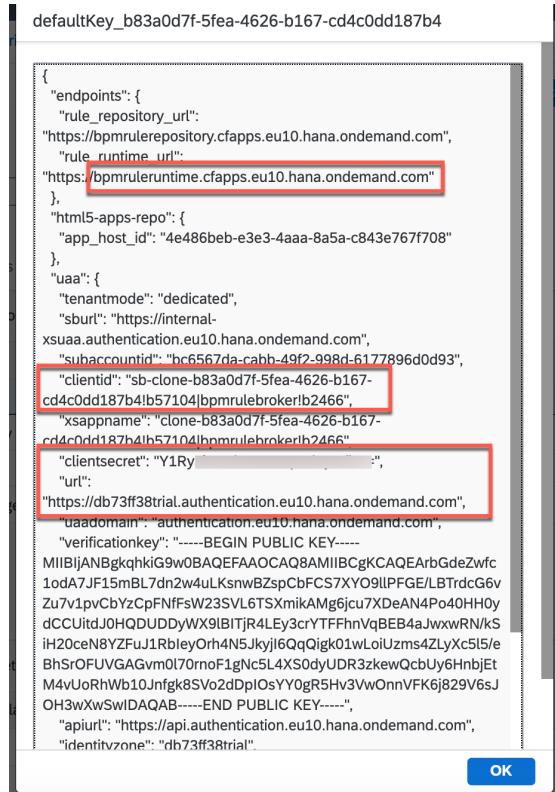
## DISCOVER BUSINESS RULES API

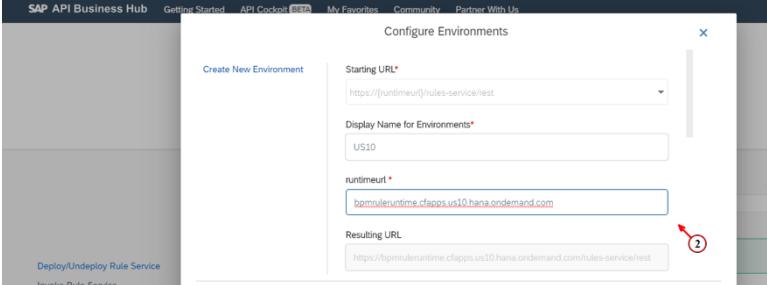
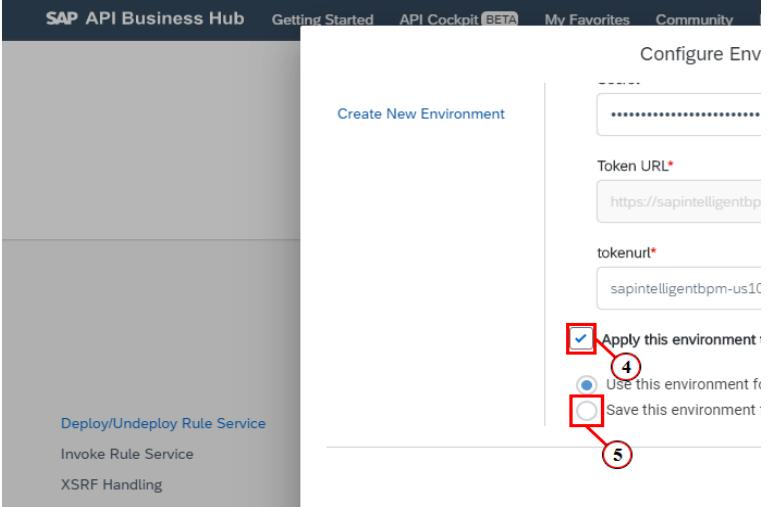
Explanation	Screenshot
<p>152. Open <b>API Business Hub</b> using this URL: <a href="https://api.sap.com">https://api.sap.com</a></p> <p>153. Click <b>Log On →</b></p>	
<p>154. using your S or P user ID</p>	
<p>155. Search Business Rules API  156. In <b>Search</b> box, enter <b>business rule</b> and press <b>Enter key</b> to search.</p>	
<p>157. Click <b>SAP Cloud Platform Business Rules API Package</b>.</p>	

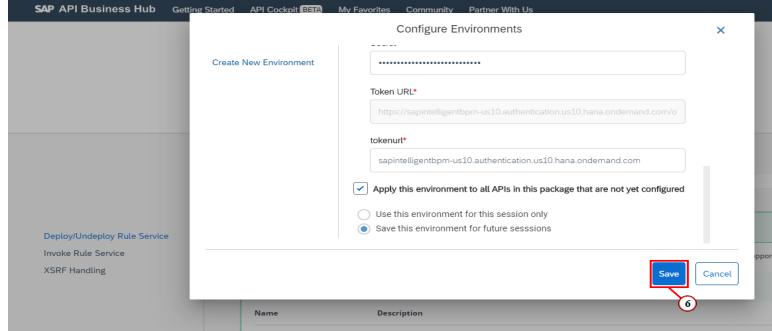
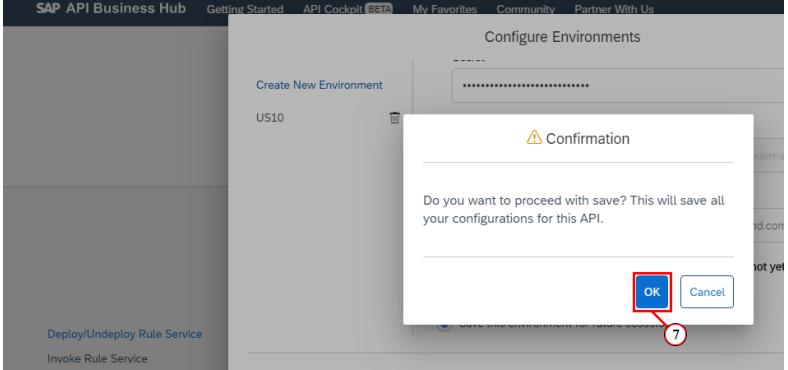
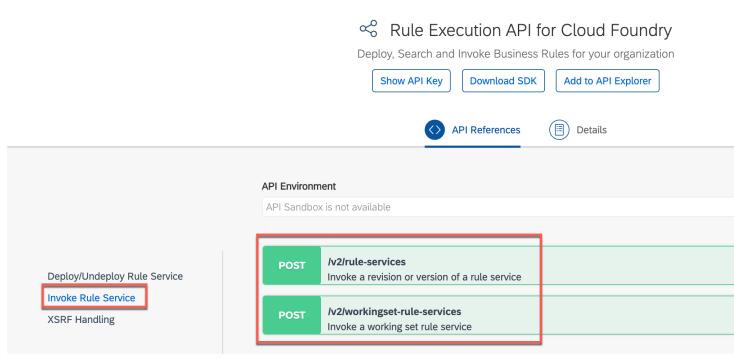
Explanation	Screenshot
<p>Note: Business Rules have two set of APIs: Authoring and Execution. You will also notice two set of versions v1 and v2. Version v1 is currently deprecated and will soon be unsupported.</p> <p>159. Click  to search the <b>execution APIs</b>.</p>	
<p>160. Click on <b>Rule Execution API for Cloud Foundry</b> version v2 APIs.</p>	

## CONFIGURE TEST ENVIRONMENT

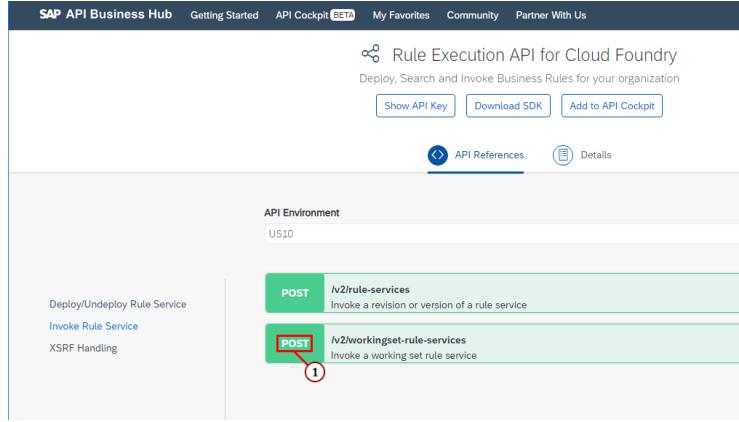
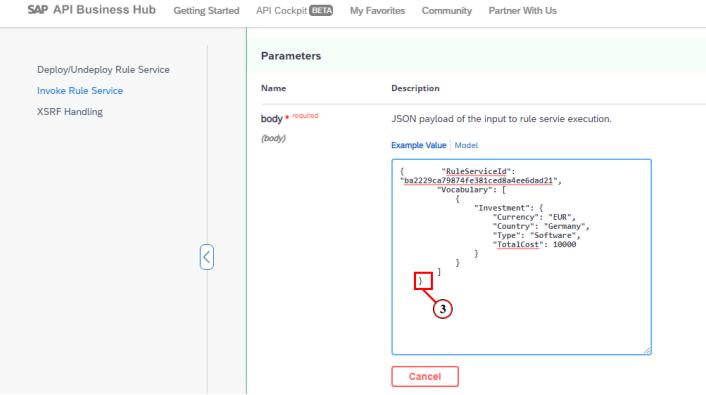
Explanation	Screenshot
<p>161. Click <a href="#">Configure Environments</a>.</p>	

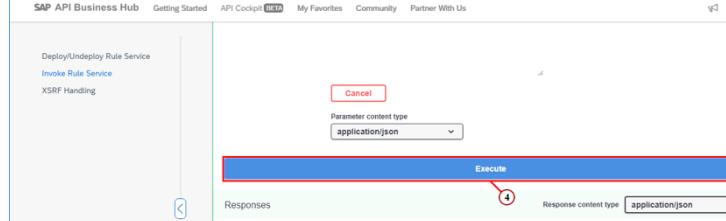
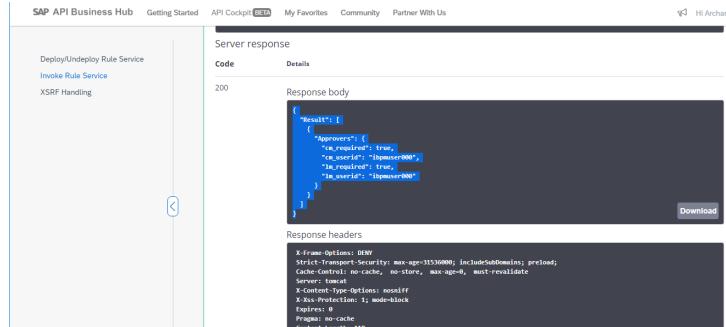
Explanation	Screenshot
<p>Fetch the information from Business Rules service instance key to configure the API Hub environment. To do so,</p>	<p>162. Login to your cloud platform trial account and navigate into your sub-account.</p> <p>163. From left panel, click <b>Service Instances</b>.</p> <p>164. From among the available instances, click on <b>wm_businessrules</b> instance to view service keys.</p> <p>165. From available service keys, click  on any service key and select <b>View</b>.</p> 
<p>166. Copy the</p> <ul style="list-style-type: none"> <li>○ rule_runtime_url,</li> <li>○ clientid,</li> <li>○ clientsecret,</li> <li>○ url (this is token url)</li> </ul>	<p>These will be used to configure the testing environment in API Business Hub.</p>  <pre> {   "endpoints": {     "rule_repository_url": "https://bpmrulerepository.cfapps.eu10.hana.ondemand.com",     "rule_runtime_url": "https://bpmrulerruntime.cfapps.eu10.hana.ondemand.com"   },   "html5-apps-repo": {     "app_host_id": "4e486beb-e3e3-4aaa-8a5a-c843e767f708"   },   "uaa": {     "tenantmode": "dedicated",     "sburl": "https://internal-xsuaa.authentication.eu10.hana.ondemand.com",     "subaccountid": "bc6567da-cabb-49f2-998d-6177896d0d93",     "clientid": "sb-clone-b83a0d7f-5fea-4626-b167-cd4c0dd187b4!bpmrulebroker!b2466",     "xsappname": "clone-b83a0d7f-5fea-4626-b167-cd4c0dd187b4!bpmrulebroker!b2466"   },   "clientsecret": "YRy...",   "url": "https://db73ff38trial.authentication.eu10.hana.ondemand.com",   "uaadomain": "authentication.eu10.hana.ondemand.com",   "verificationkey": "-----BEGIN PUBLIC KEY-----MIIBjANBkgqhkIG9w0BAQEFAOCAQ8AMIBCgKCAQEArbGdeZwf1odA7JF15mB7dn2w4uLKnswBzSpCbFCS7XYO9lLPFGE/LBTrdcG6vZu7vpCvbYzCpFnFfsW23SVL6TSMikAMg6icu7XDeAN4Po40HOydCCUiIdJ0HQDUDDyWX9lBTjR4LEy3crYTFHnVqBEB4aJwxwRN/kSiH20ceN8YZFuJ1RbIeyOrh4N5Jkjj6QqQigk01wLuiUzms4ZLyxc5i5/eBhSrOFUVGAQm0l70rn0F1gNc5L4XS0dyUDR3zkewQcbUy6HnbjEtM4VuOrhWb10Jnfgk8SVo2dDplOsYY0gr5Hv3vOnnVFK6j829V6sJOH3wXwSwIDAQAB-----END PUBLIC KEY-----",   "apiurl": "https://api.authentication.eu10.hana.ondemand.com",   "identityzone": "db73ff38trial" } </pre>

Explanation	Screenshot
<p>167. Set configuration properties</p> <p>Enter the respective details in the configuration properties as copied from the business rules service key in previous step:</p> <ul style="list-style-type: none"> <li>• Display Name: Trial</li> <li>• <b>runtimeurl:</b> &lt;as copied above&gt;</li> <li>• <b>Client Id:</b> &lt;as copied above&gt;</li> <li>• <b>Secret:</b> &lt;as copied above&gt;</li> </ul> <p>Press <b>Tab</b> to move to next property.</p>	
<p>168. Enter the following as token url and other standard properties:</p> <p><b>tokenurl:</b> &lt;as copied above&gt;</p> <p>Note: please remove <b>https://</b> from the token url and copy the rest.</p> <p>For Example: If the URL is <a href="https://db73ff38trial.authentication.eu10.hana.ondemand.com">https://db73ff38trial.authentication.eu10.hana.ondemand.com</a></p> <p>Then token URL will be: db73ff38trial.authentication.eu10.hana.ondemand.com</p> <p>169. Click  for <b>Apply this environment to all APIs.</b></p> <p>170. Click  for <b>Save this environment for future sessions.</b></p>	

Explanation	Screenshot
<p>171. Click .</p>	
<p>172. Click .</p>	
<p>There are two kinds of runtime APIs.</p> <ul style="list-style-type: none"> <li>○ The first one is for versioned invocation which means if you have deployed any version of the rule service and want to invoke it.</li> <li>○ The second one is for the working set invocation which means that you do not have any version but have deployed the working set directly.</li> </ul> <p>173. From the left options, click <u>Invoke Rule Service</u>.</p>	

## INVOKE BUSINESS RULES

Explanation	Screenshot
<p>174. Click <b>POST</b> of <b>/v2/working-set-rule-services</b> API.</p>	
<p>175. Click <b>Try out</b>.</p>	
<p>176. Press <b>Tab</b> until you reach the <b>body</b> section.</p> <p>177. In the <b>body</b> section, <b>Copy &amp; Paste</b> this text:</p> <pre>{ "RuleServiceId": "ba2229ca79874fe381ced8a4ee6dad21", "Vocabulary": [ { "Investment": { "Currency": "EUR", "Country": "Germany", "Type": "Software", "TotalCost": 10000 } } ] }</pre> <p>Replace the <b>RuleServiceId</b> with rule service id of your rules project.</p>	 <p>⚠️ Be careful during copying. Sometimes during copy and paste, the spaces are added automatically. In that case the payload will be considered as invalid and execution will fail. Remove the spaces.</p>

Explanation	Screenshot
<p>178. Click <b>Execute</b>.</p>	
<p>You will see the response after the successful rule execution.</p> <p>Try and change the country to “India” in the input body, and you will see a different response.</p>	 <pre> {   "Result": [     {       "Approver": {         "Is_Required": true,         "Is_Error": "NoError000",         "Is_Override": true,         "Is_Error": "NoError000"       }     }   ] } </pre>

## SUMMARY

You have completed the exercise!

You are now able to:

- Create & Activate Project, Data Object, Ruleservice, Ruleset and Rules.
- Configure Value Help in Data Object.
- Use Microsoft Excel Import/Export functionality in Decision Table.
- Deploy Ruleservice in SAP Cloud Platform.
- Discover Business Rules API in SAP API Business Hub.
- Configure Test Environment for Cloud Foundry.
- Execute Business Rules Execution API.

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