

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

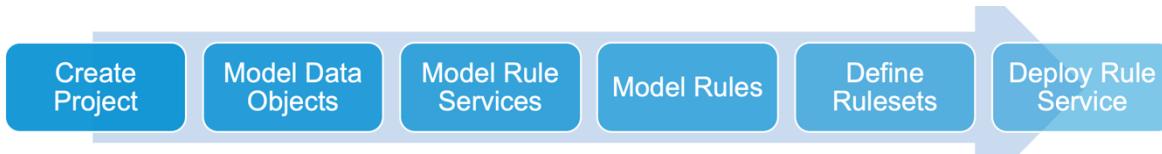
Estimated time: 45 minutes

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, the title 'Determine Approvers Rule' is displayed. Underneath the title, there are two tabs: 'Details' and 'Decision Table', with 'Decision Table' being the active tab. The 'Decision Table' section has a header row with columns: 'If' (containing 'Investment.Country', 'Investment.Type', and 'Investment.Total Cost') and 'Then' (containing 'Central Manager User...', 'Local Manager User ID', 'Local Manager Appro...', and 'Central Manager Appro...'). Below the header is a table with six rows of data. The data is as follows:

If	Then
Investment.Country = 'Germany'	Central Manager User...: 'ibpmuser000' Local Manager User ID: 'ibpmuser000' Local Manager Appro...: true Central Manager Appro...: true
Investment.Country = 'India'	Central Manager User...: 'varun.rao.001' Local Manager User ID: 'kiran.shah.012' Local Manager Appro...: false Central Manager Appro...: true
Investment.Country = 'India'	Central Manager User...: 'varun.rao.001' Local Manager User ID: 'kiran.shah.012' Local Manager Appro...: true Central Manager Appro...: true
Investment.Country = 'United States of ...'	Central Manager User...: 'frank.mathew.023' Local Manager User ID: 'peter.collins.1441' Local Manager Appro...: true Central Manager Appro...: false
Investment.Country = 'United States of ...'	Central Manager User...: 'frank.mathew.023' Local Manager User ID: 'nina.hanks.001' Local Manager Appro...: true Central Manager Appro...: 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.

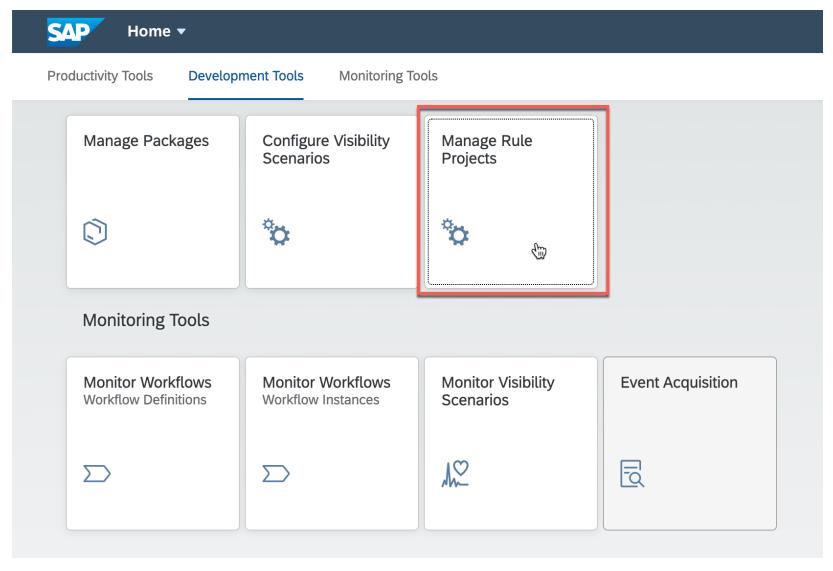
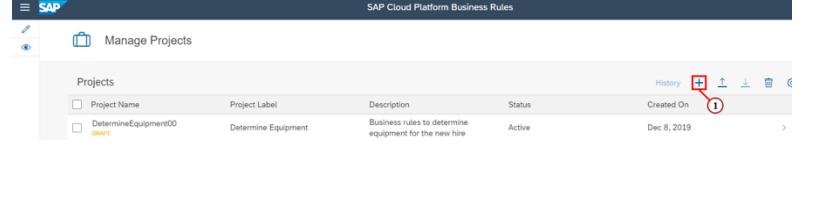
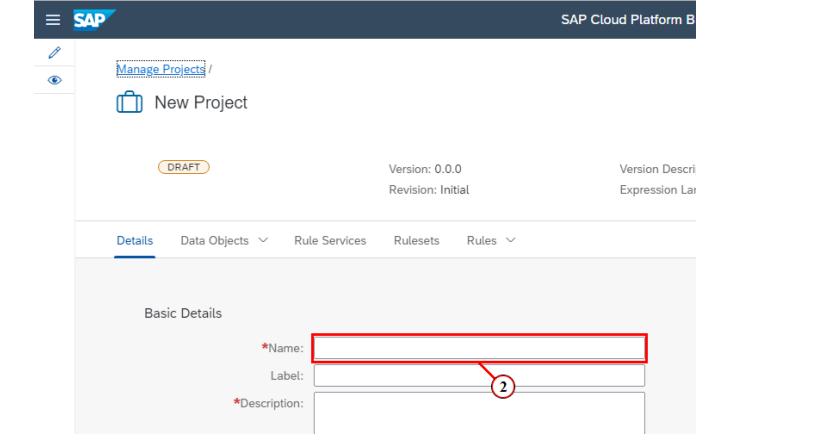


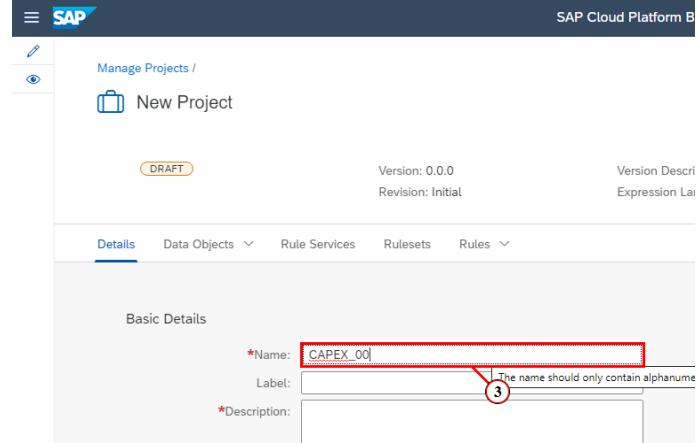
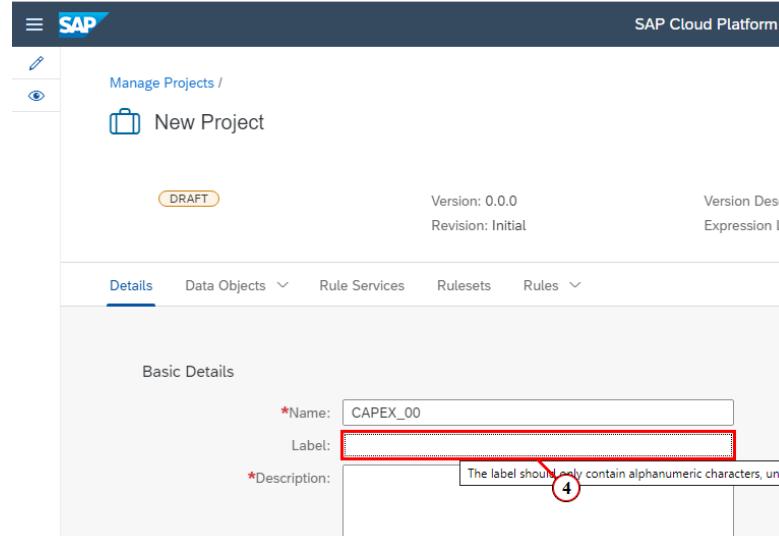
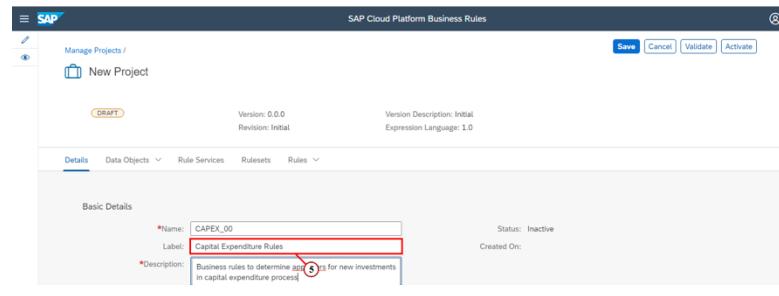
### Exercise Description:

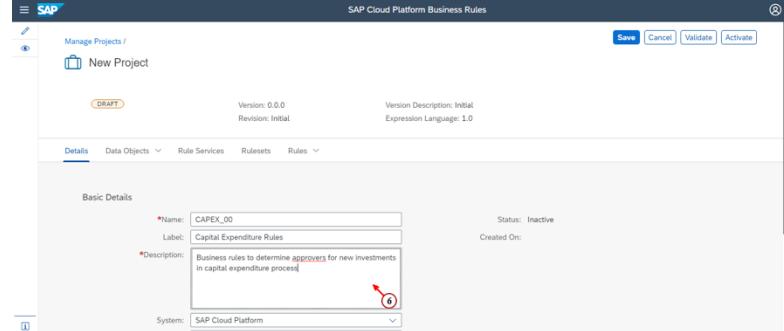
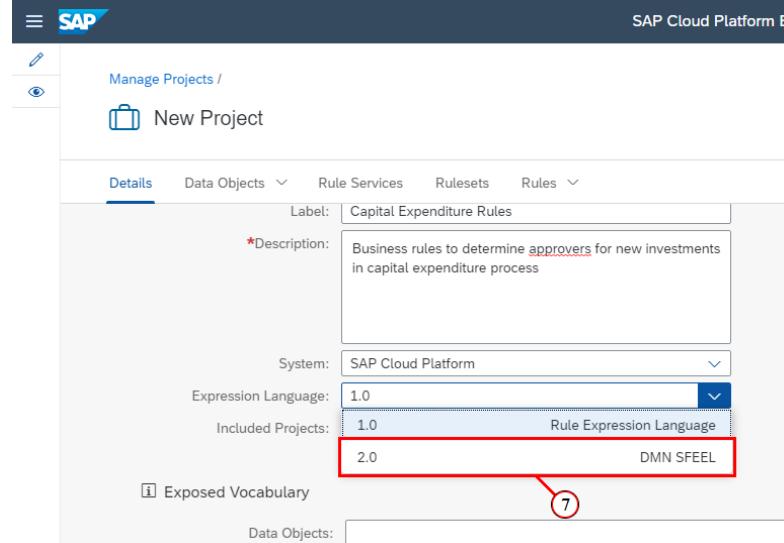
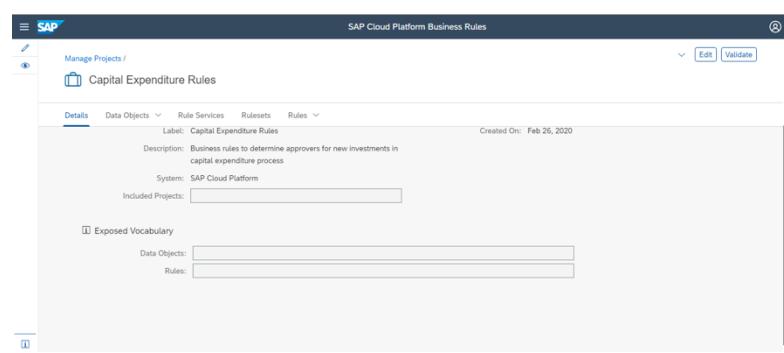
In this exercise you will do the following:

- *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*

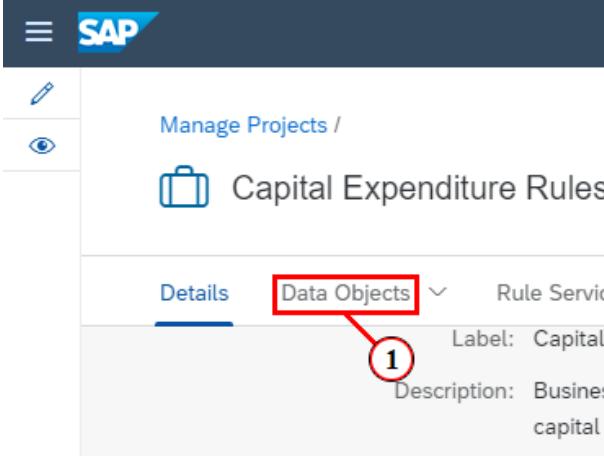
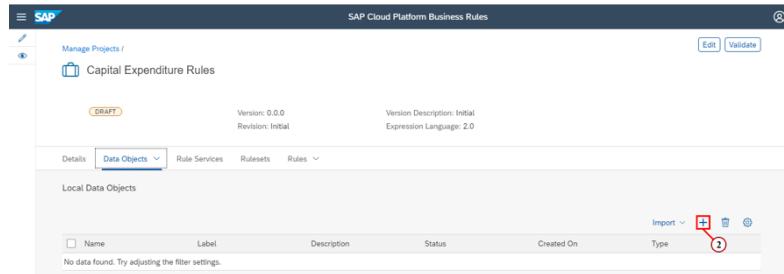
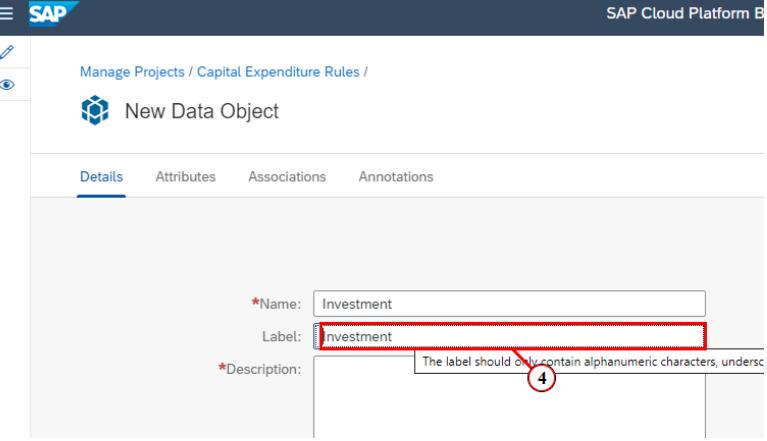
## CREATE PROJECT

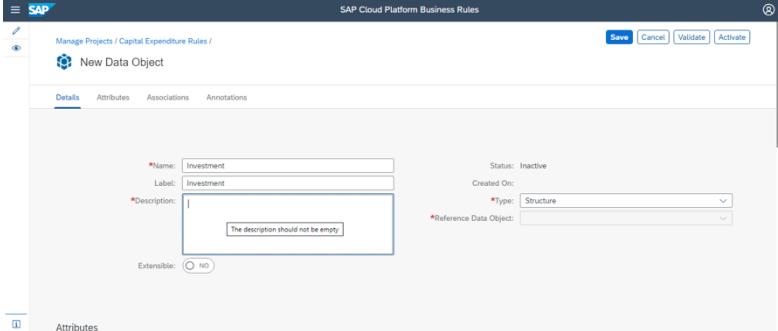
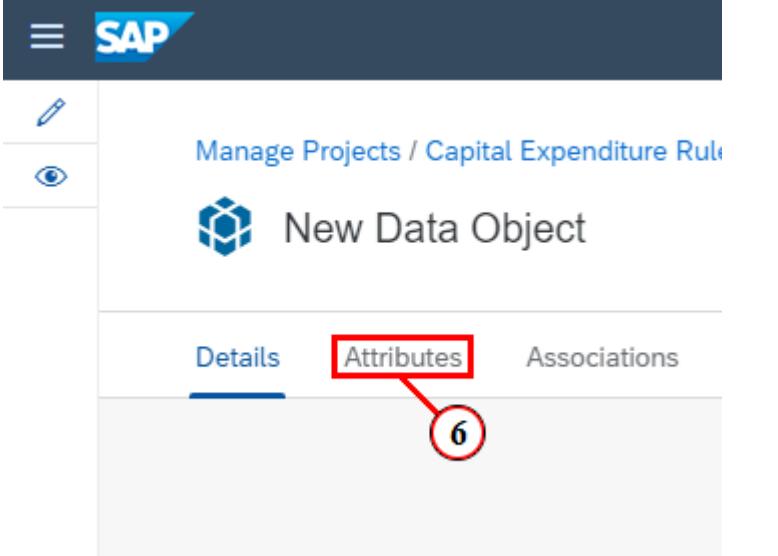
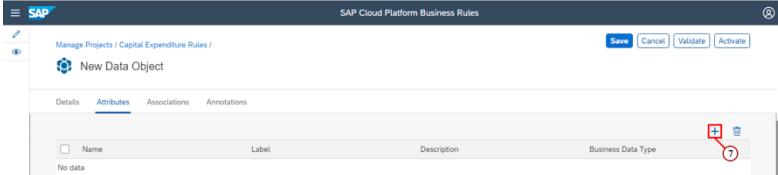
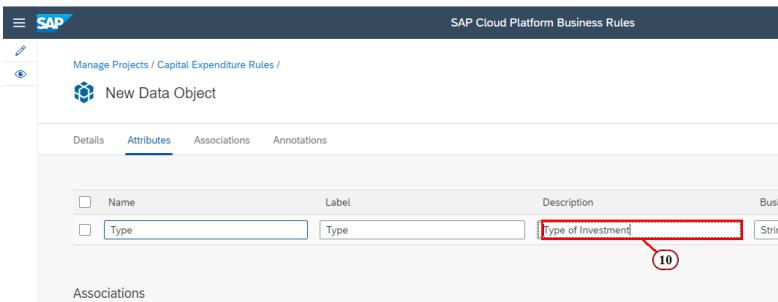
Explanation	Screenshot
<p>1. Open Workflow Management Launchpad and click to open <b>Manage Rule Projects</b>.</p> <ul style="list-style-type: none"> <li>• Login with trial username and passwords</li> </ul>	
<p>2. Click <b>+</b> to create a new business rules project.</p>	
<p>3. Configure Project Name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

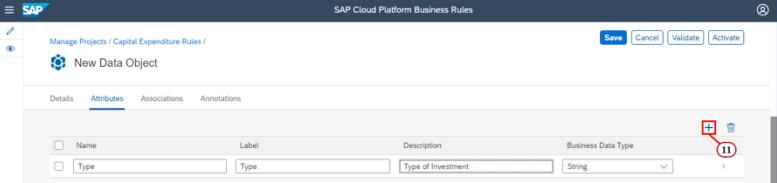
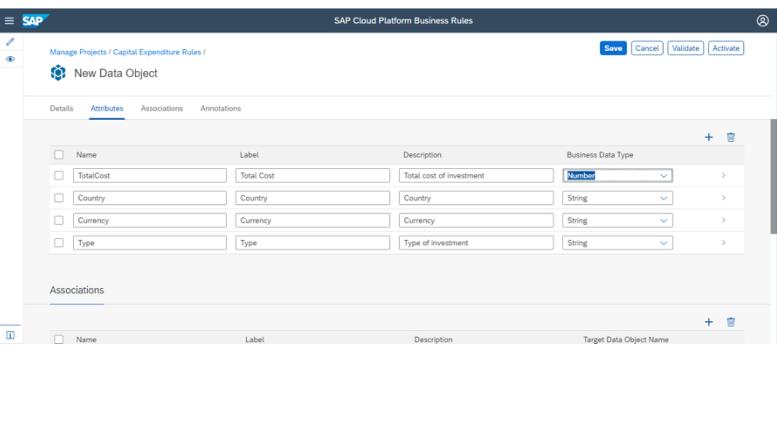
Explanation	Screenshot
<p>5. Enter <b>CAPEX_00</b> in the <b>Name</b> box.</p>	
<p>6. Enter <b>Capital Expenditure Rules</b> in the <b>Label</b> box.</p>	
<p>7. Enter <b>Capital Expenditure Rules</b> in the <b>Label</b> box.</p>	

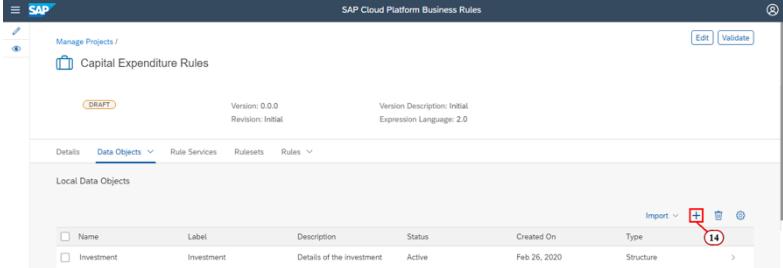
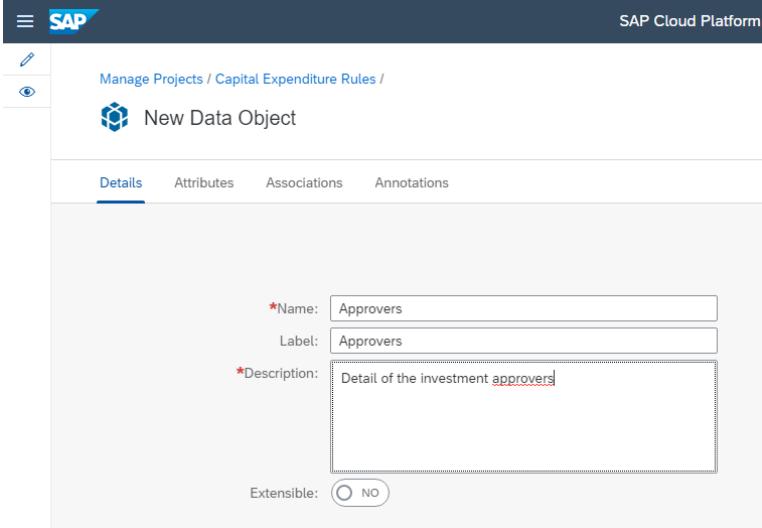
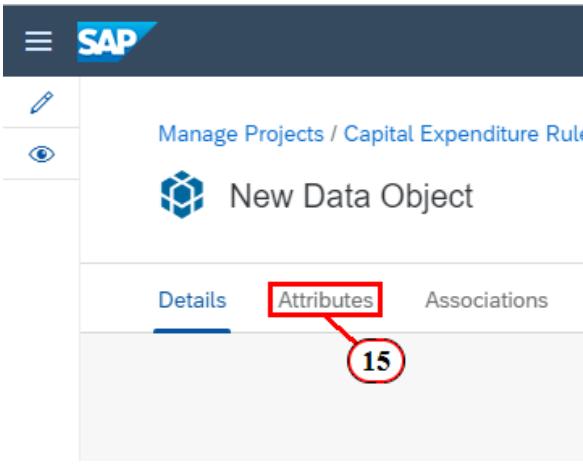
Explanation	Screenshot
<p>8. Enter <b>Business rules to determine approvers for new investments in capital expenditure process</b> in <b>Description</b> box.</p>	
<p>9. Click to select <b>2.0</b> as the <b>Expression Language</b>.</p>	
<p>10. Click <b>Save</b>.</p>	
<p>Your business rules project is created with the needed configurations.</p>	

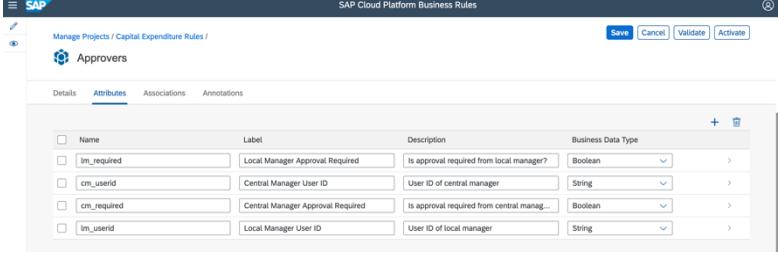
## CREATE DATA OBJECTS

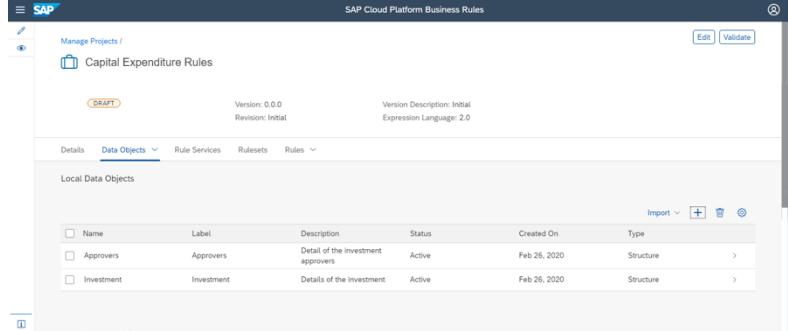
Explanation	Screenshot
<p>11. Click <b>Data Objects</b>.</p>	
<p>12. Create <b>Data Object</b>.      13. Click <b>+</b>.</p>	
<p>14. Enter <b>Investment</b> in the <b>Name</b> and the <b>Label</b> box.</p>	

Explanation	Screenshot
<p>15. Enter <b>Details of the investment</b> in the <b>Description</b> box.</p>	
<p>16. Click <b>Attributes</b>.</p>	
<p>17. Click .</p>	
<p>18. Enter <b>Type</b> in the <b>Name</b> and <b>Label</b> box.      19. Enter <b>Type of investment</b> in the <b>Description</b> box.</p>	

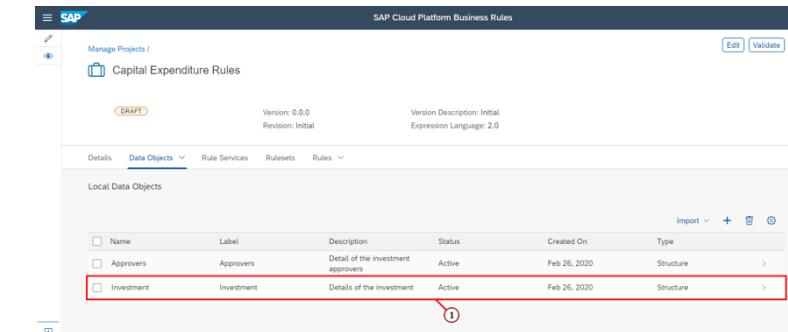
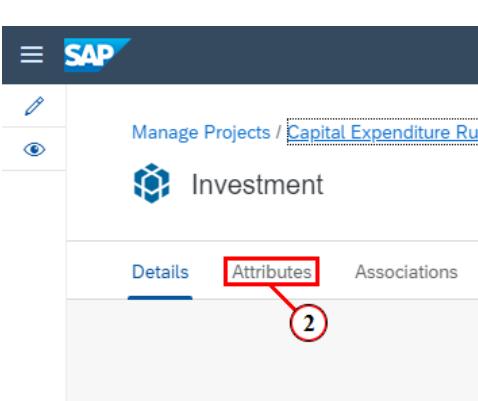
Explanation	Screenshot																
<p>1. Click .</p>																	
<p>2. Repeat the steps to create more data object attributes with following details:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>Currency</td> <td>Currency</td> <td>Currency</td> <td>String</td> </tr> <tr> <td>Country</td> <td>Country</td> <td>Country</td> <td>String</td> </tr> <tr> <td>TotalCost</td> <td>Total Cost</td> <td>Total cost of investment</td> <td>Number</td> </tr> </tbody> </table>	Name	Label	Description	Type	Currency	Currency	Currency	String	Country	Country	Country	String	TotalCost	Total Cost	Total cost of investment	Number	
Name	Label	Description	Type														
Currency	Currency	Currency	String														
Country	Country	Country	String														
TotalCost	Total Cost	Total cost of investment	Number														
<p>3. Click .</p>																	
<p>4. Click .</p>																	

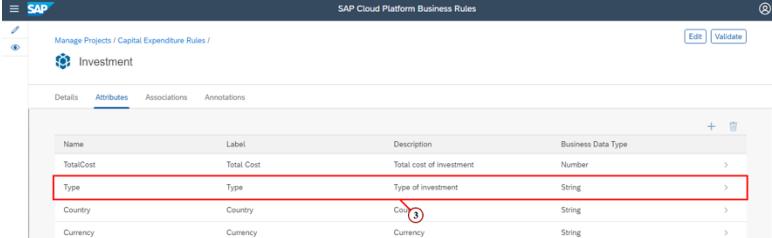
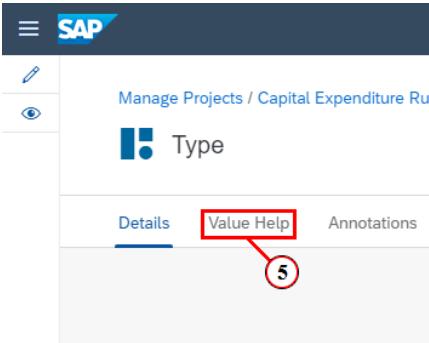
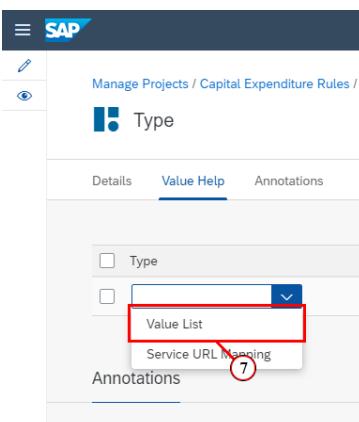
Explanation	Screenshot
<p>5. Click .</p> <p>Note: Ensure that you are in <b>Data Objects</b> tab.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The top navigation bar has 'Manage Projects / Capital Expenditure Rules'. Below it, there's a status bar with 'DRAFT', 'Version: 0.0.0', 'Revision: Initial', and 'Expression Language: 2.0'. The main area has tabs: 'Details' (selected), 'Data Objects' (highlighted in blue), 'Rule Services', 'Rulesets', and 'Rules'. Under 'Data Objects', it says 'Local Data Objects'. A table below shows two rows: 'Name' (checkbox) and 'Investment' (checkbox); 'Label' (checkbox) and 'Investment' (checkbox); 'Description' (checkbox) and 'Details of the investment' (checkbox); 'Status' (checkbox) and 'Active'; 'Created On' (checkbox) and 'Feb 26, 2020'; 'Type' (checkbox) and 'Structure'; and a 'Import' button with a red circle around the 'New' icon (number 14).</p>
<p>6. Enter <b>Approvers</b> in <b>Name</b> box.</p> <p>7. Enter <b>Approvers</b> in <b>Label</b> box.</p> <p>8. Enter <b>Detail of investment approvers</b> in <b>Description</b> box.</p>	 <p>The screenshot shows the 'Manage Projects / Capital Expenditure Rules / New Data Object' screen. 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'. A radio button for 'Extensible' is set to 'NO'.</p>
<p>9. Click <b>Attributes</b>.</p>	 <p>The screenshot shows the same 'New Data Object' screen, but the 'Attributes' tab is now highlighted with a red box and circled with the number 15.</p>

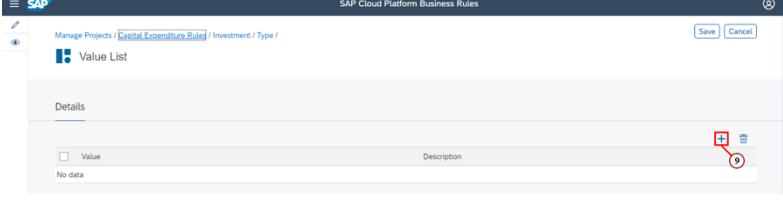
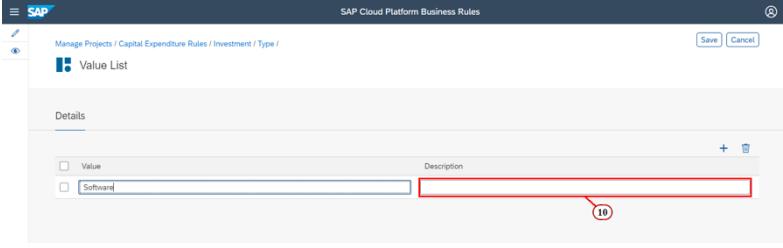
Explanation	Screenshot																				
<p>10. Repeat the steps to create Approvers data object attributes with following details:</p> <p>Attributes:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>cm_userid</td> <td>Central Manager User ID</td> <td>User ID of central manager</td> <td>String</td> </tr> <tr> <td>lm_userid</td> <td>Local Manager User ID</td> <td>User ID of local manager</td> <td>String</td> </tr> <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_required</td> <td>Central Manager Approval Required</td> <td>Is approval required from central manager?</td> <td>Boolean</td> </tr> </tbody> </table>	Name	Label	Description	Type	cm_userid	Central Manager User ID	User ID of central manager	String	lm_userid	Local Manager User ID	User ID of local manager	String	lm_required	Local Manager Approval Required	Is approval required from local manager?	Boolean	cm_required	Central Manager Approval Required	Is approval required from central manager?	Boolean	
Name	Label	Description	Type																		
cm_userid	Central Manager User ID	User ID of central manager	String																		
lm_userid	Local Manager User ID	User ID of local manager	String																		
lm_required	Local Manager Approval Required	Is approval required from local manager?	Boolean																		
cm_required	Central Manager Approval Required	Is approval required from central manager?	Boolean																		
<p>11. Click <a href="#">Activate</a>.</p>																					
<p>12. Click <a href="#">Capital Expenditure Rules</a>.</p>																					

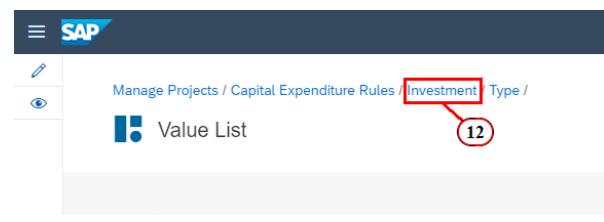
Explanation	Screenshot
<p>You have created and configured data objects in business rules project.</p> <p><b>Investment</b> data object will be used as <i>Input</i> and <b>Approver</b> data object will be used as <i>Output</i> in the rule service.</p> <p>These data object &amp; their attributes will be used while modelling rule expressions.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the top navigation bar, 'Manage Projects / Capital Expenditure Rules' is selected. Below it, the 'Data Objects' tab is active. The interface displays three local data objects: 'Approvers' (Approvers), 'Investment' (Investment), and 'Name'. Each data object has columns for Name, Label, Description, Status, Created On, and Type. The 'Investment' row is highlighted with a red box and a circled number '1' pointing to it.</p>

#### CONFIGURE VALUE HELP IN DATA OBJECT

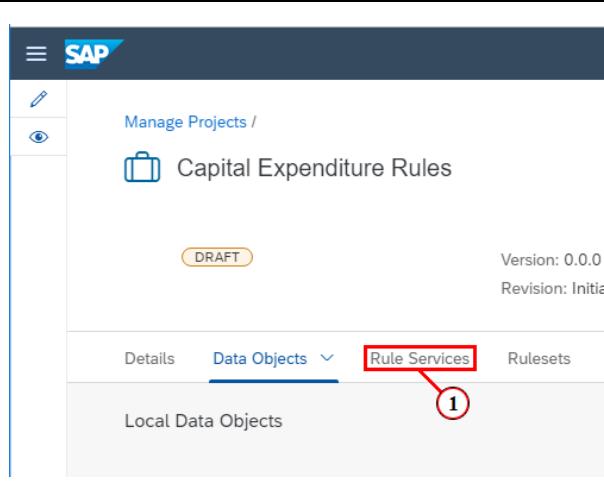
Explanation	Screenshot
<p>13. Click to open <b>Investment</b> data object.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The 'Investment' data object is selected, indicated by a red box and a circled number '1' pointing to it. The interface shows the 'Details' tab is active, displaying information about the 'Investment' data object.</p>
<p>14. Click <b>Attributes</b> to add attributes to the data object.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The 'Investment' data object is selected. The 'Attributes' tab is highlighted with a red box and a circled number '2' pointing to it. The interface shows the 'Details' tab is active, displaying information about the 'Investment' data object.</p>

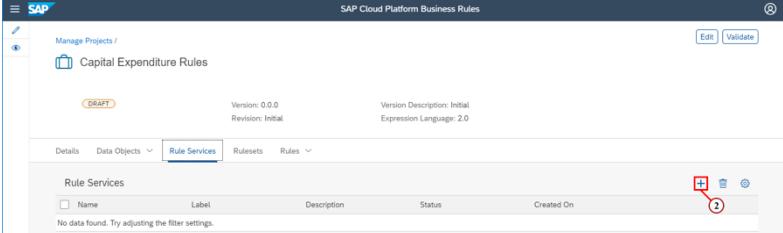
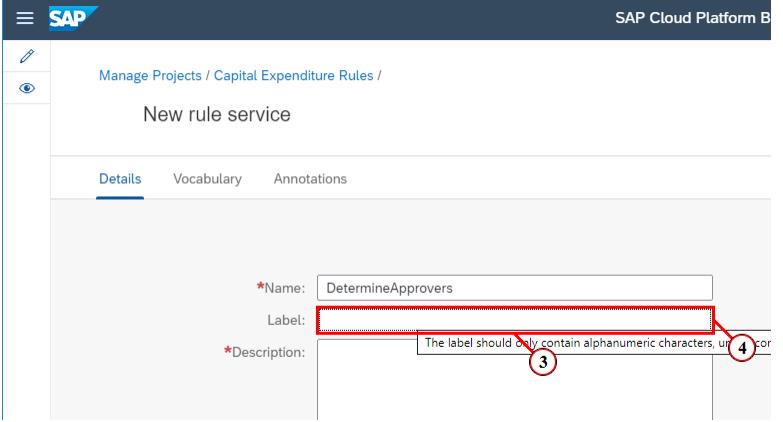
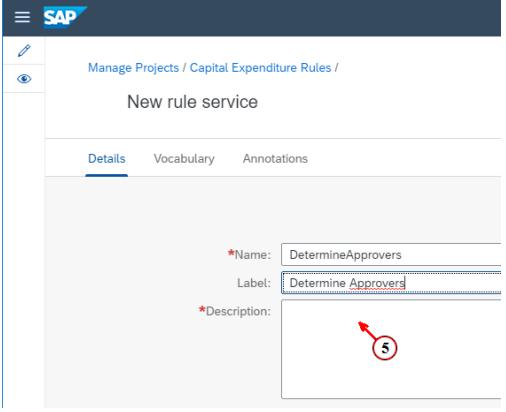
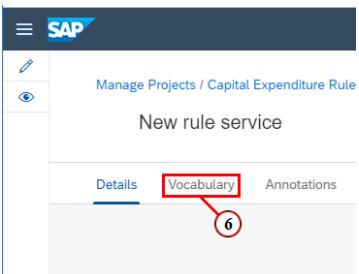
Explanation	Screenshot
15. Click to open <b>Type</b> attribute.	
16. Click <b>Edit</b> .	
17. Click <b>Value Help</b> .	
18. Click <b>+</b> .	
19. Click <b>Value List</b> .	

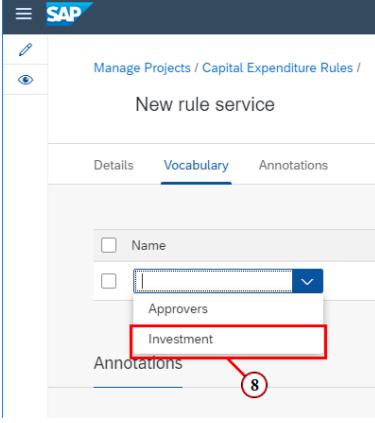
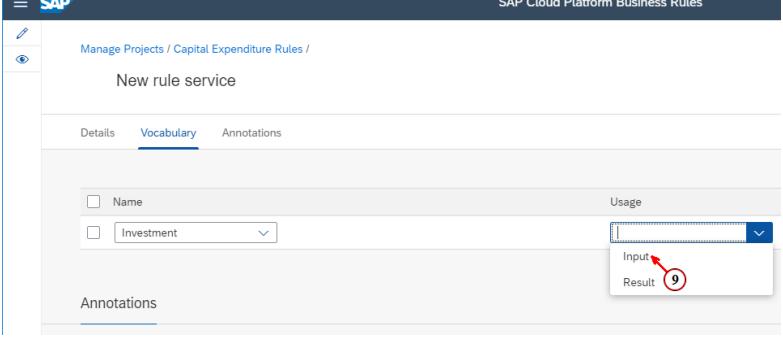
Explanation	Screenshot										
<p>Note: there are two kinds of value help          (a) Static and (b) Dynamic. Dynamic <b>value help</b> can be created with Service <b>URL Mapping</b> and <b>Static</b> can be created with <b>Value List</b> type. In dynamic value you can connect any backend system and make a service call. In this exercise, you will create static value help where you will manually create value-description pair.</p>											
<p>20. Click to on the <b>Value List</b> row.</p>											
<p>21. Click  to add values to the value list.</p>											
<p>22. Click and enter <b>Software</b> in <b>Value</b> and <b>Description</b> box.</p>											
<p>23. 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
Value	Description										
Machinery	Machinery										
Building	Building										
Equipment	Equipment										
Service	Service										
<p>24. Click .</p>											

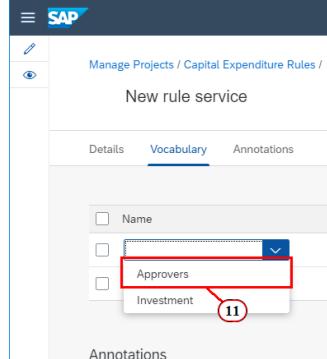
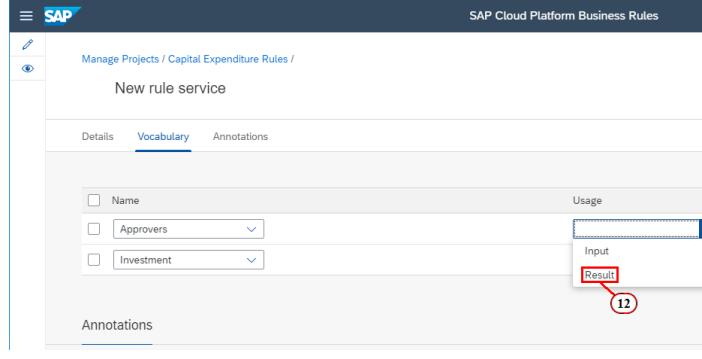
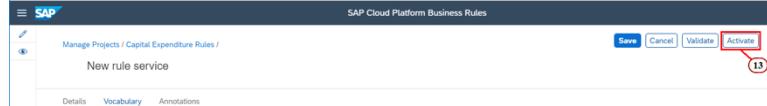
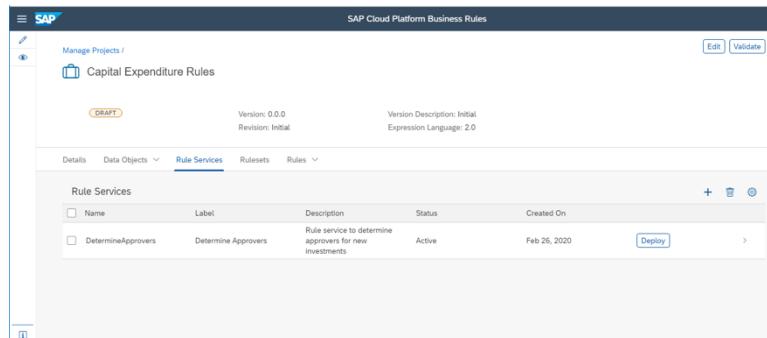
Explanation	Screenshot
25. Click <b>Investment</b> .	
26. Click <b>Edit</b> .	
27. Click <b>Activate</b> .	
28. Click <b>Capital Expenditure Rules</b> .	

## CREATE RULE SERVICE

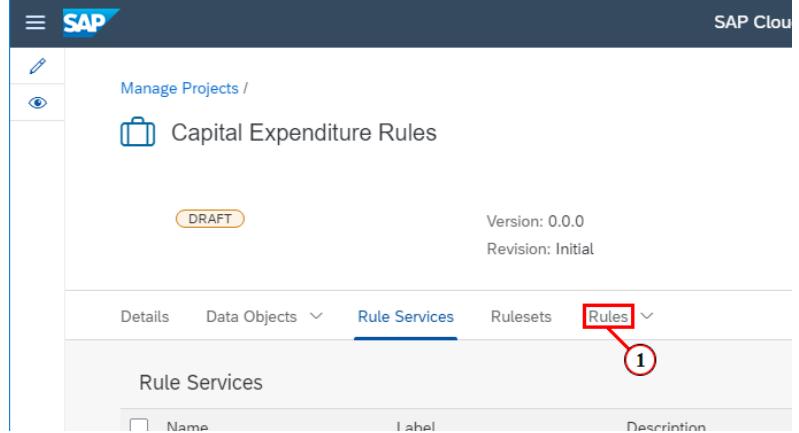
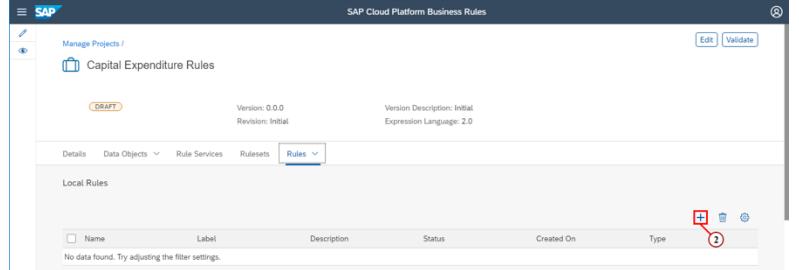
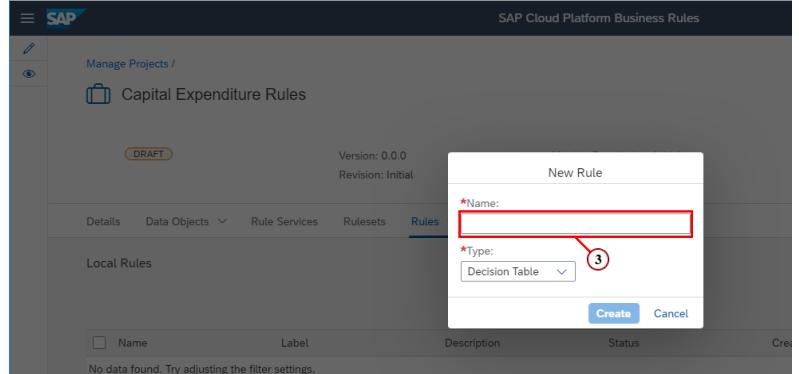
Explanation	Screenshot
29. Click <b>Rule Services</b> .	

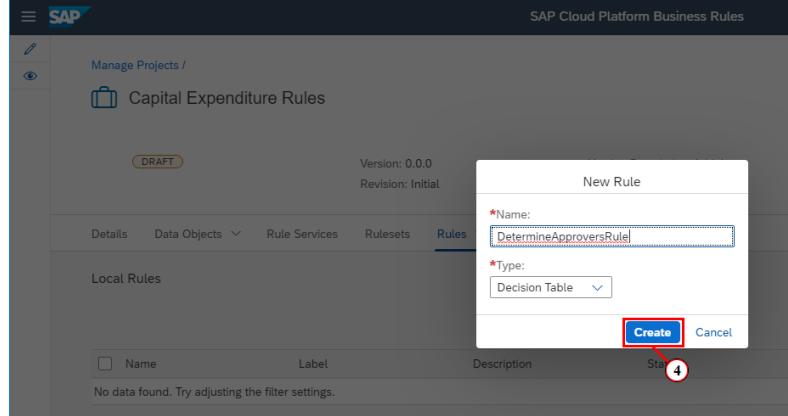
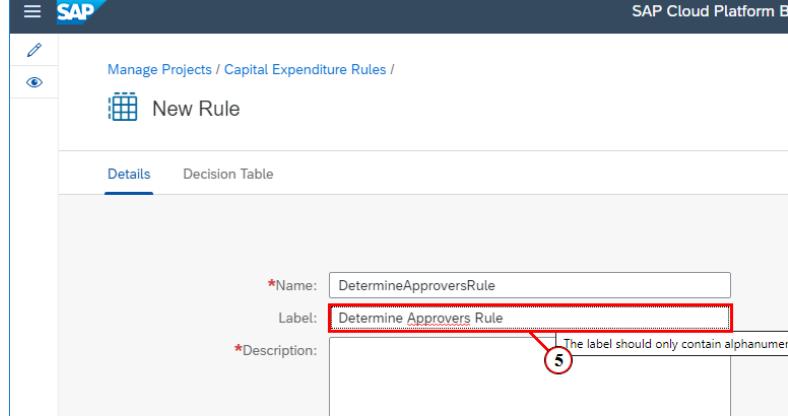
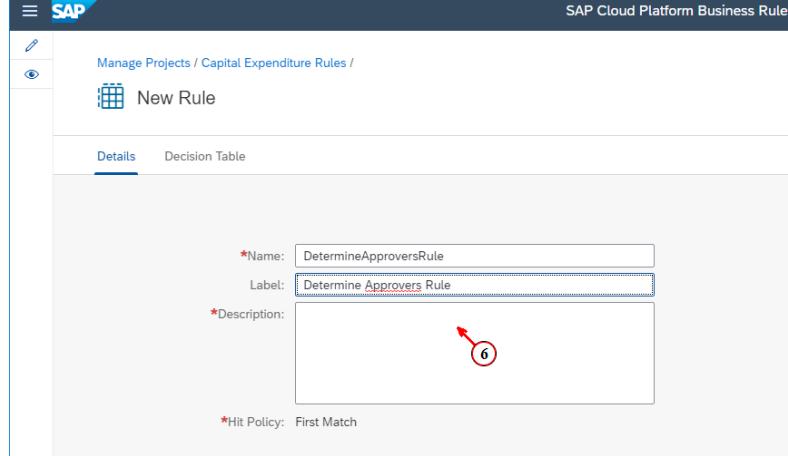
Explanation	Screenshot
<p>30. Create Rule Service.</p> <p>31. Click .</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the top right, there are 'Edit' and 'Validate' buttons. Below them, it says 'Version: 0.0.0' and 'Revision: Initial'. The main area is titled 'Rule Services' and contains columns for Name, Label, Description, Status, and Created On. A red box highlights the 'Label' column header, and a red arrow labeled '2' points to it.</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>	 <p>The screenshot shows the 'New rule service' creation page. The 'Name' field is filled with 'DetermineApprovers'. The 'Label' field is filled with 'Determine Approvers', which is highlighted by a red box and a red arrow labeled '3'. A tooltip message 'The label should only contain alphanumeric characters, underscores, and hyphens.' is shown next to the label input field. The 'Description' field is empty.</p>
<p>55. Click to enter <b>Rule service to determine approvers for new investment</b> in Description box.</p>	 <p>The screenshot shows the 'New rule service' creation page again. The 'Name' field is 'DetermineApprovers'. The 'Label' field is 'Determine Approvers'. The 'Description' field now contains the text 'Rule service to determine approvers for new investment', which is highlighted by a red box and a red arrow labeled '5'.</p>
<p>56. Click <b>Vocabulary</b>.</p>	 <p>The screenshot shows the 'New rule service' creation page with the 'Vocabulary' tab selected. The 'Details' tab is still active, indicated by a blue underline. The 'Vocabulary' tab is highlighted by a red box and a red arrow labeled '6'.</p>

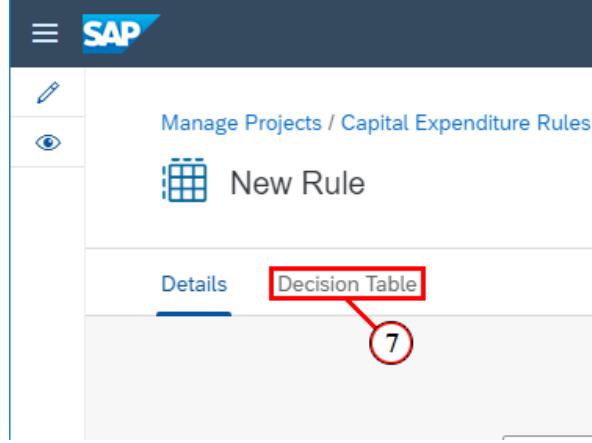
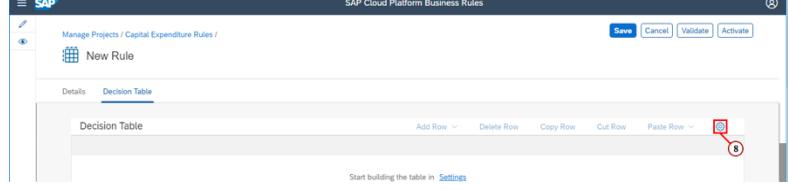
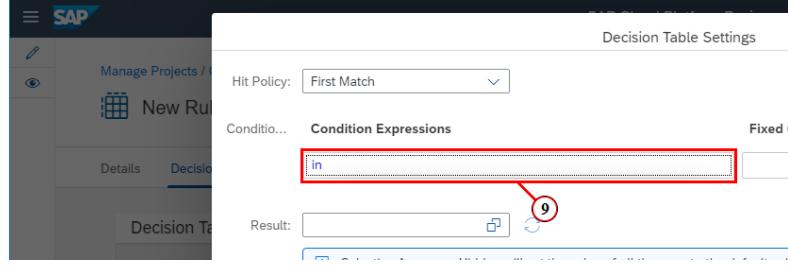
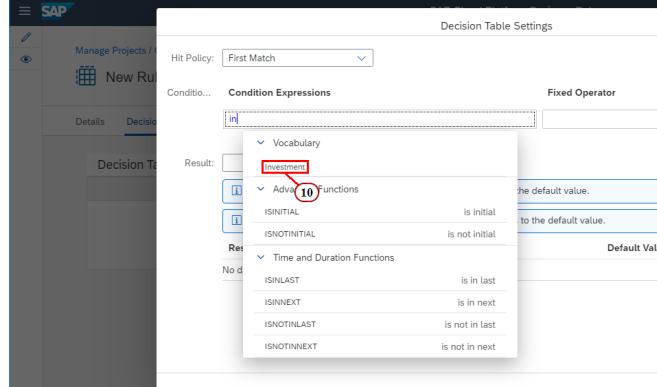
Explanation	Screenshot
57. Click  .	
58. Click to select <b>Investment</b> .	
59. Click to select <b>Input</b> .	
60. Click  .	

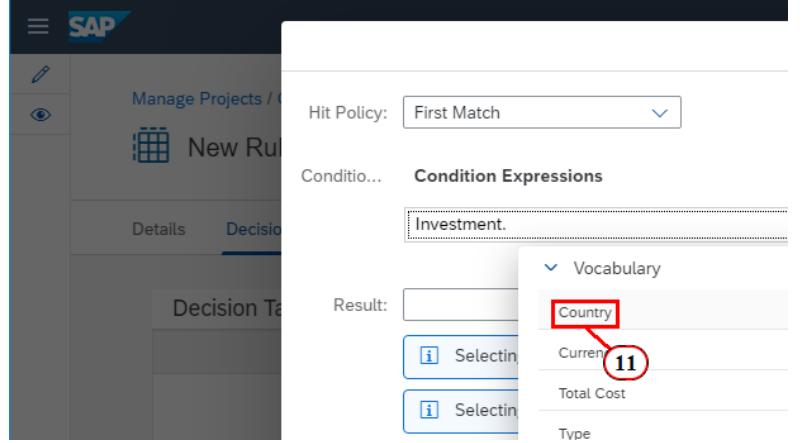
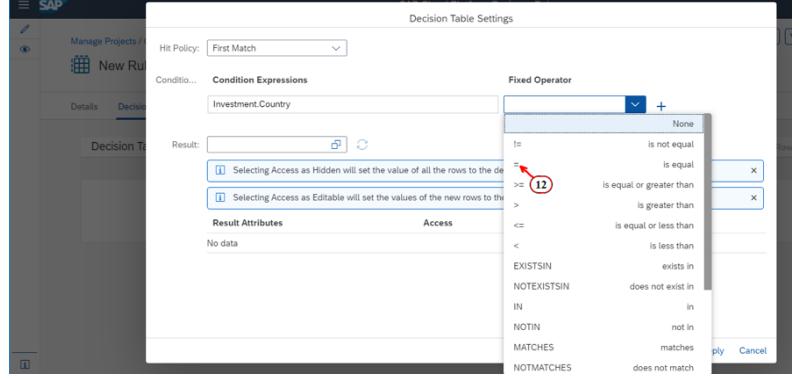
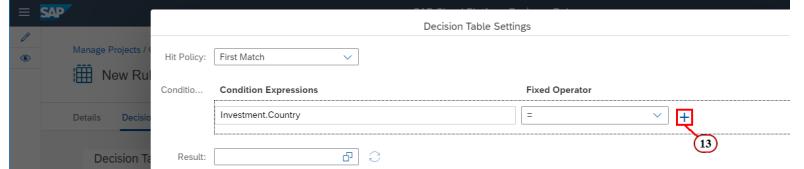
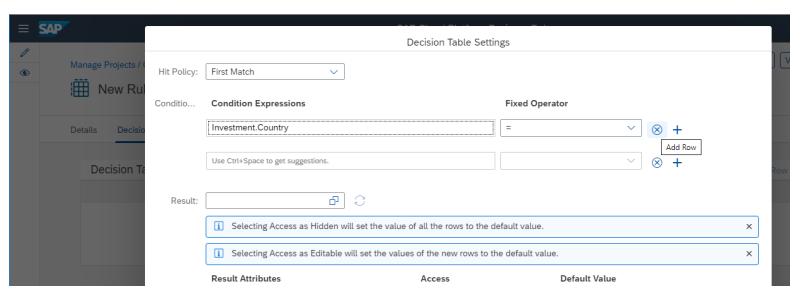
Explanation	Screenshot
61. Click to select <b>Approvers</b> .	
62. Click <b>Result</b> .	
63. Click <b>Activate</b> .	
64. Click <b>Capital Expenditure Rules</b> .	
You have created and configured Rule Service which will be finally deployed once we have configured all the rule entity models.	

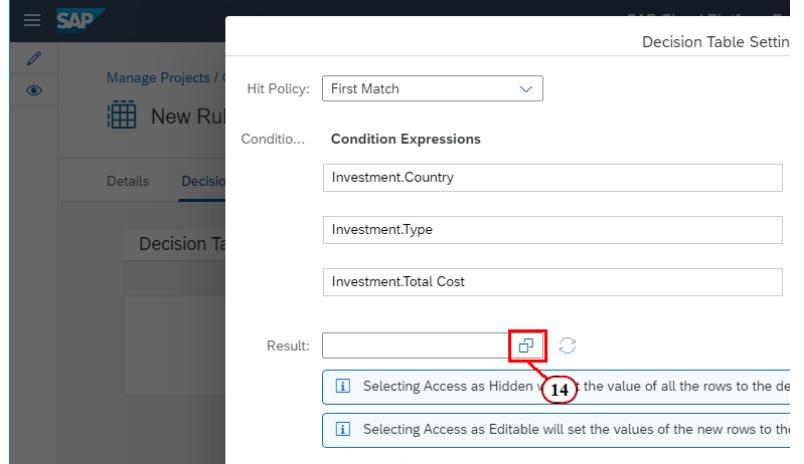
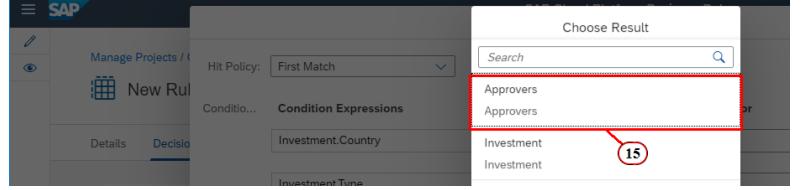
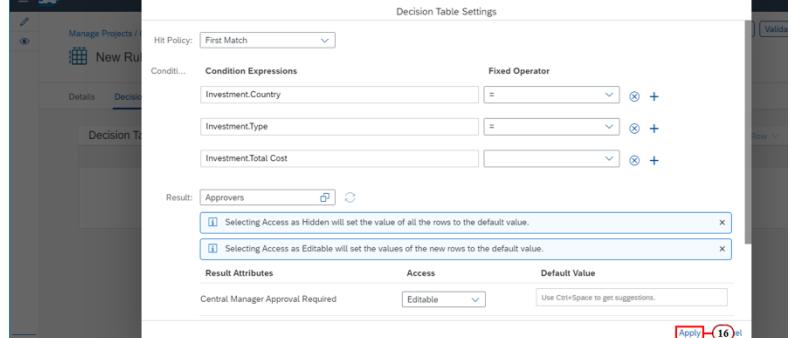
## CREATE DECISION TABLE RULE

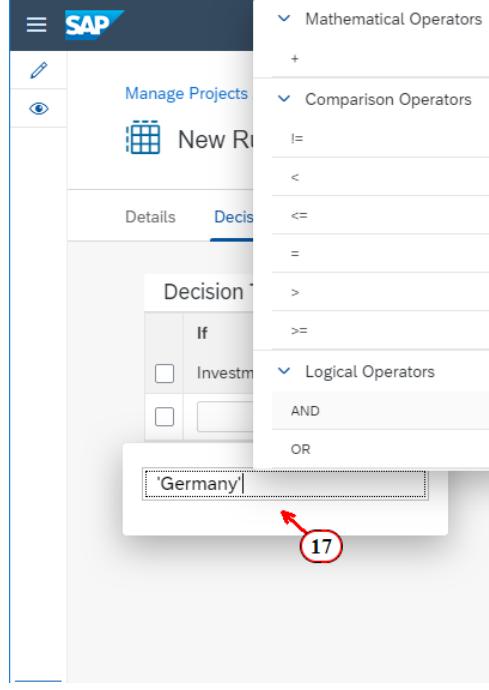
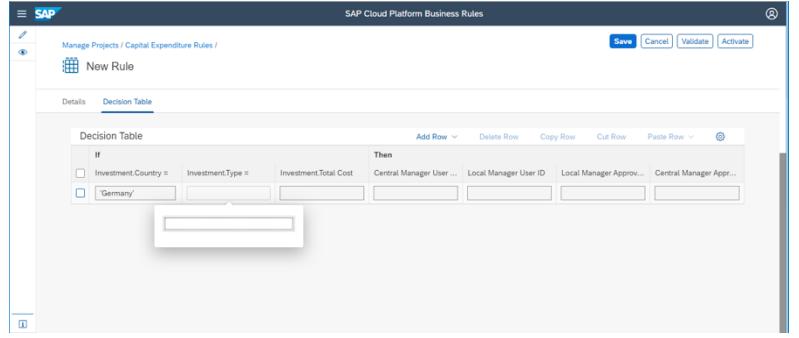
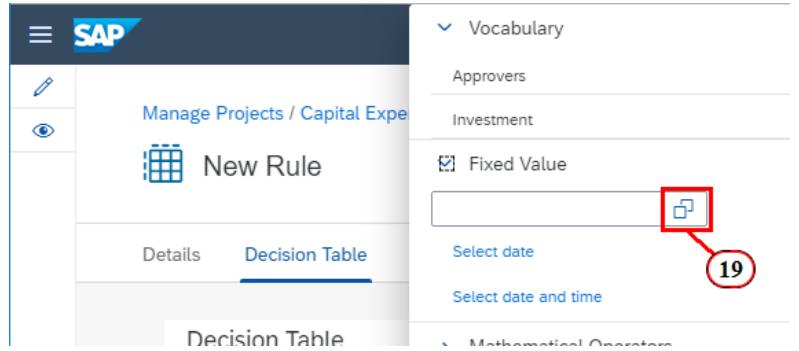
Explanation	Screenshot
<p>65. Click Rules.</p>	
<p>66. Create Rule 67. Click +.</p>	
<p>68. Click to enter <b>DetermineApproversRule</b> in Name box.</p>	

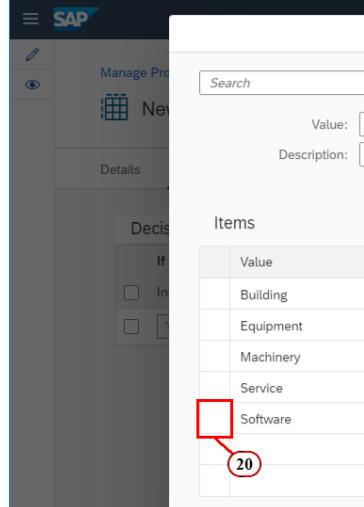
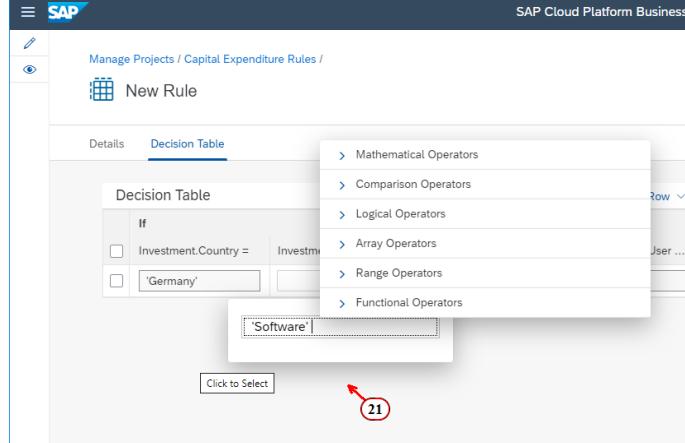
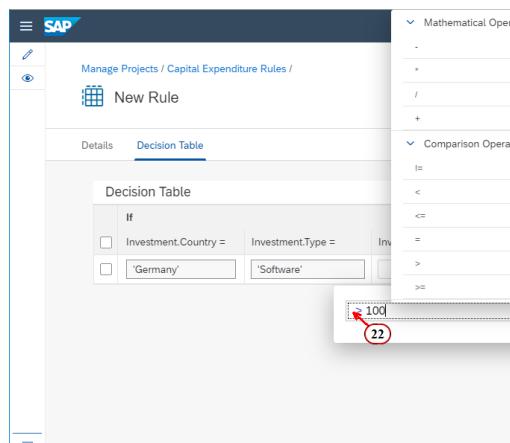
Explanation	Screenshot
<p>69. Click <b>Create</b>.</p>	
<p>70. Click and enter <b>Determine Approvers Rule</b> in <b>Label</b> box.</p>	
<p>71. Click to enter <b>Rules to determine approvers for the new investments based on type, country and total cost of the investment</b> in <b>Description</b> box .</p>	

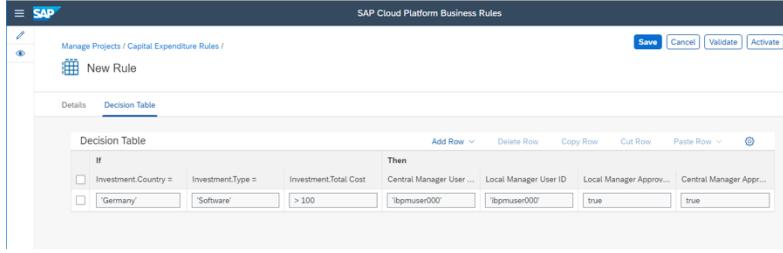
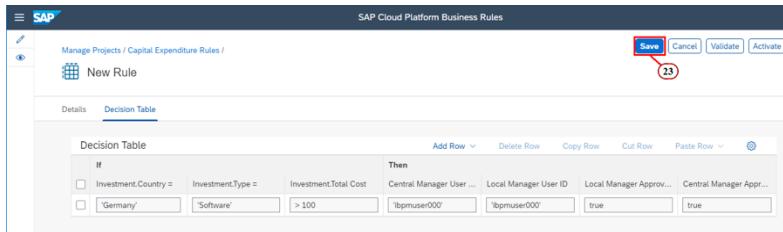
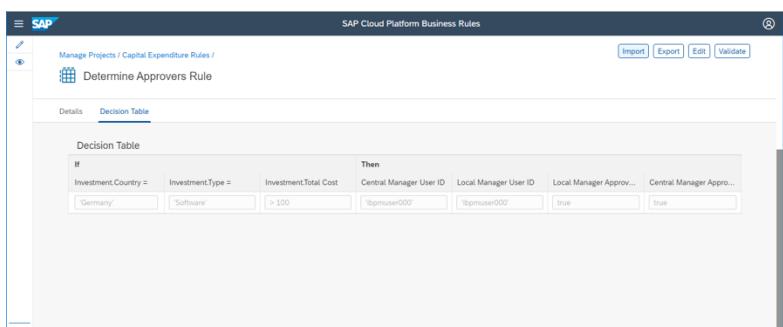
Explanation	Screenshot
72. Click <b>Decision Table</b> .	
73. Click  .	
<p>Note: As you start typing in the <b>Condition Expression</b> box, you will get in-place context help with the list of Vocabulary, Operators and Functions.</p> <p>74. Click and enter <b>in</b> the condition expression box.</p>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

Explanation	Screenshot						
77. Click <b>Country</b> .							
78. In <b>Fixed Operator</b> drop down, click <b>= is equal</b> operator.							
79. Click <b>+</b> .							
80. Repeat the steps above to add few more condition expressions as following:	<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>81. Click  to select <b>Result</b> data object.</p>	
<p>82. 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> <p>83. Click <b>Apply</b>.</p>	

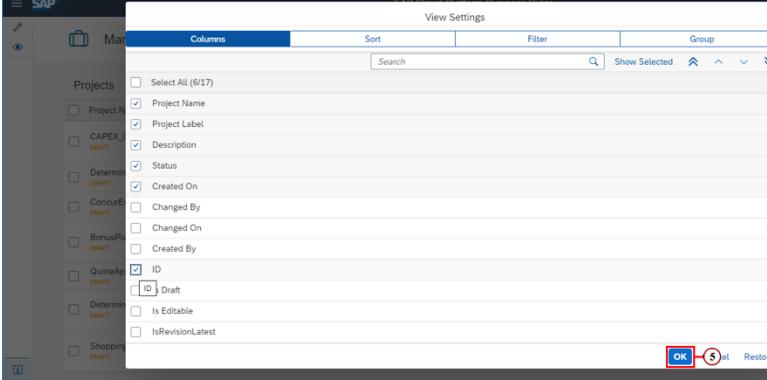
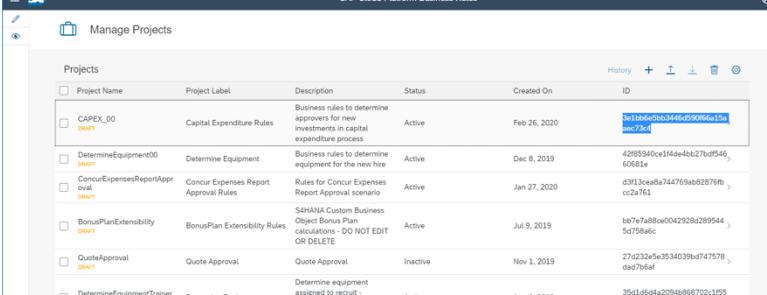
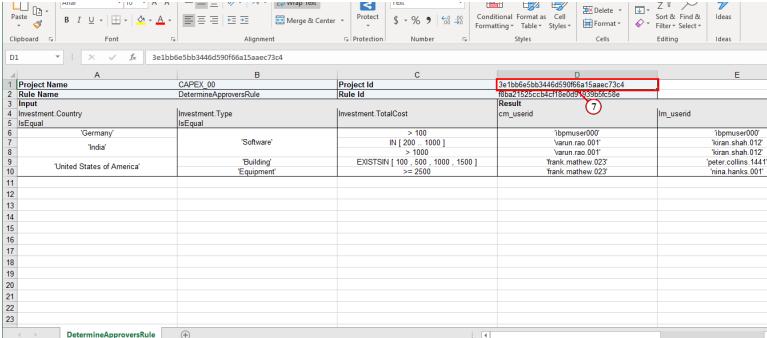
Explanation	Screenshot
<p>84. Click on the input field of <b>Investment.Country</b> column and enter 'Germany'.</p> <p>After you have finished typing, press <b>Enter</b> key to confirm or click outside the input field.</p>	
<p>Note: In this expression, you will choose the value from the value help defined for this attribute.</p> <p>85. Please press <b>Ctrl+ Space</b> or press any key.</p>	
<p>86. Expand <b>Fixed Value</b> and click  to select value help.</p>	

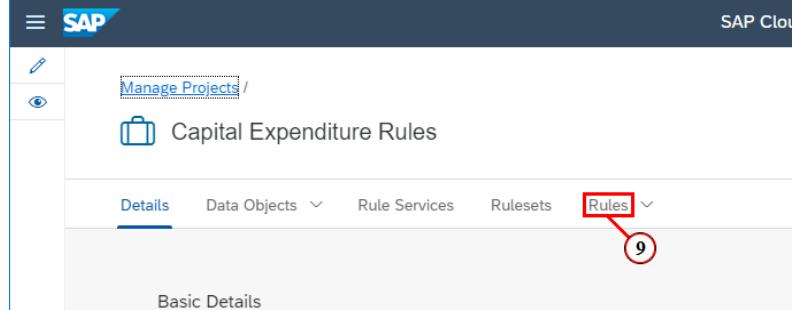
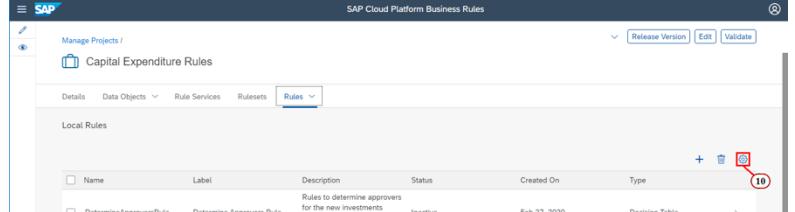
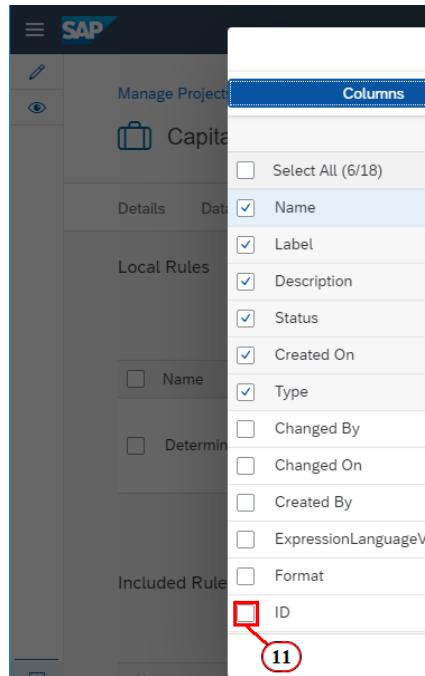
Explanation	Screenshot
<p>87. Click to select <b>Software</b> from the value help.</p>	
<p>88. Click <b>Enter</b> to confirm or click outside the input field.</p>	
<p>89. Click to enter <b>&gt; 100</b>            90. Press <b>Enter</b> to confirm.</p>	

Explanation	Screenshot										
<p>91. 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	
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>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>											

### IMPORT DECISION TABLE FROM MICROSOFT EXCEL

Explanation	Screenshot
<p>92. Download the <b>DetermineApproversRule</b> excel in the same folder in GitHub.</p> <p>93. 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>94. 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 Manage Rule Projects.</p> <p>95. Navigate back to projects. 96. Click <a href="#">Manage Projects</a>.</p>	
97. Click .	
98. Click .	

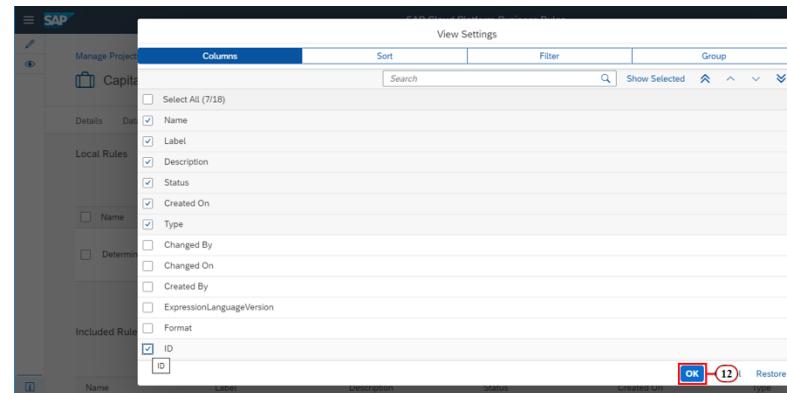
Explanation	Screenshot
99. Click <b>OK</b> .	
100. Select and press <b>Ctrl+C</b> or <b>Command+C</b> to copy.	
101. Paste the copied Project ID.  Note: ensure that there are no leading or lagging space while you do the copy & paste.	
102. Click to open project.	

Explanation	Screenshot
103. Click <b>Rules</b> .	
104. Click  .	
105. Click  .	

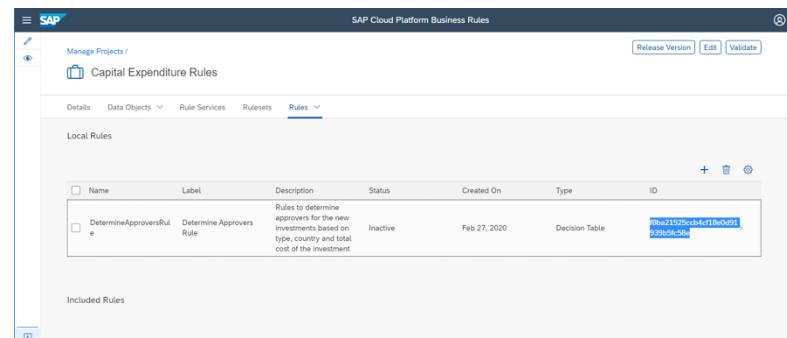
## Explanation

106. Click **OK**.

## Screenshot



107. Select and press **Ctrl+C** or **Command+C** to copy.

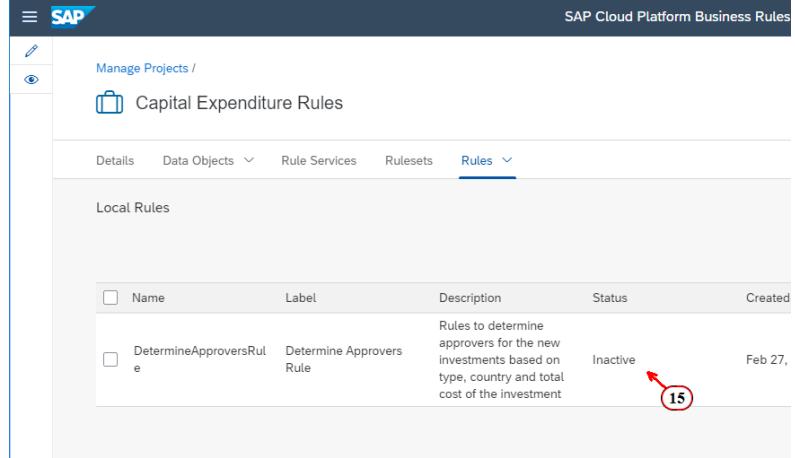
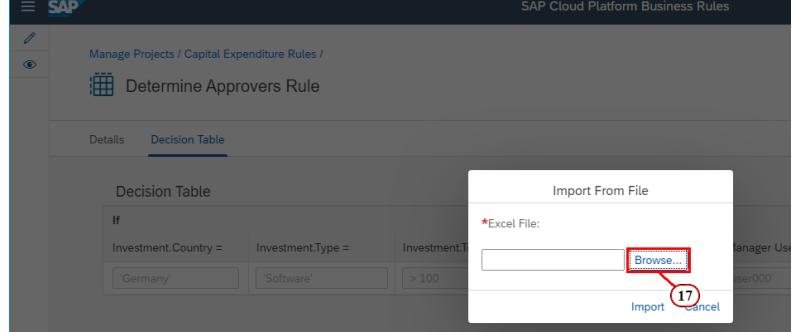
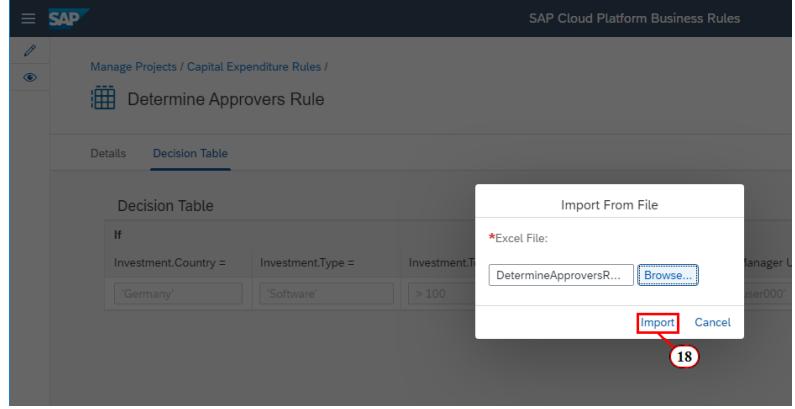


108. Paste the Rule ID

Note: ensure that there are no leading or lagging spaces while you do the copy paste

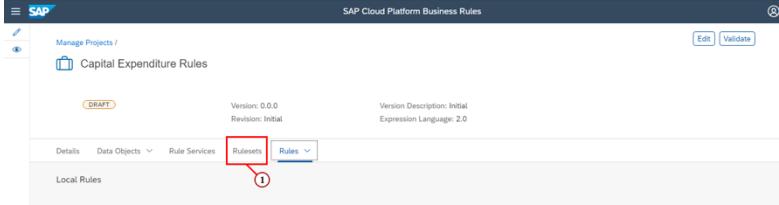
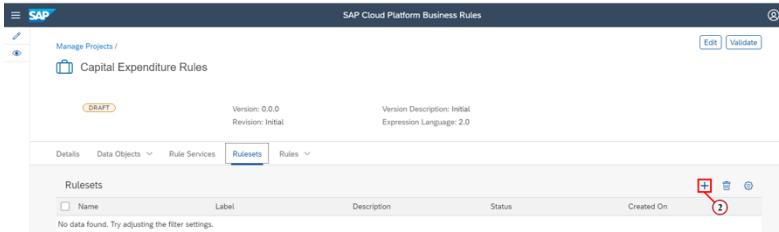
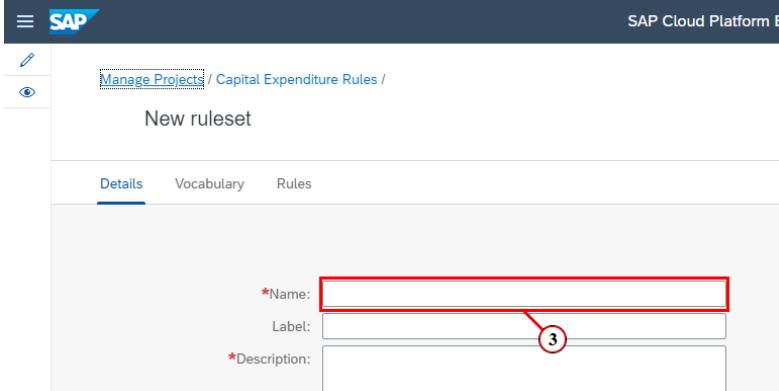
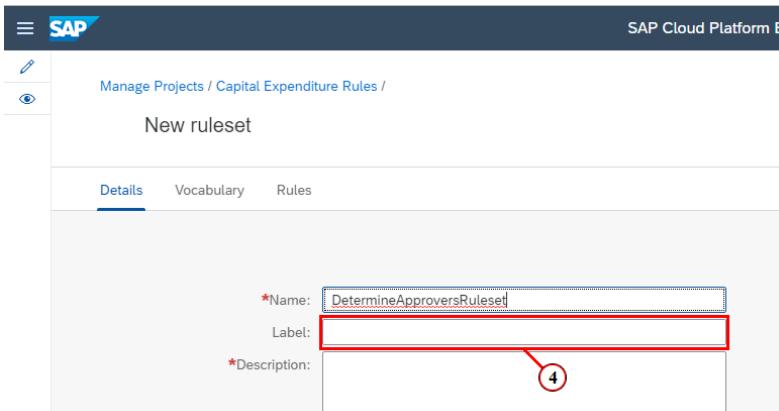
109. Also, change the *cm\_userid* and *lm\_userid* of the first row (line number 6) to your trial username.

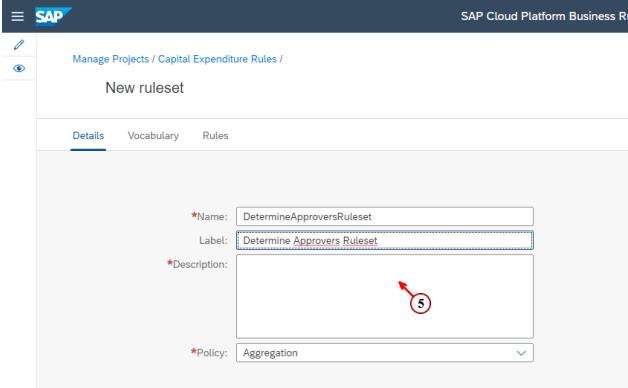
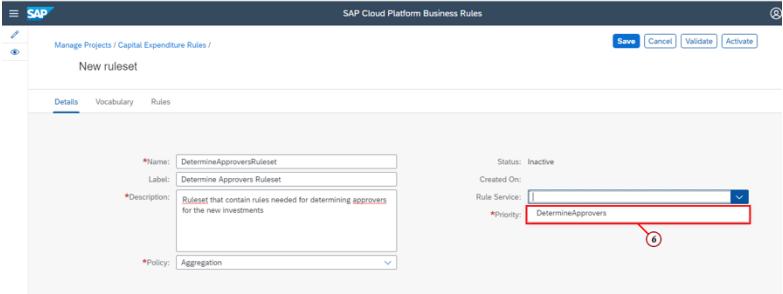
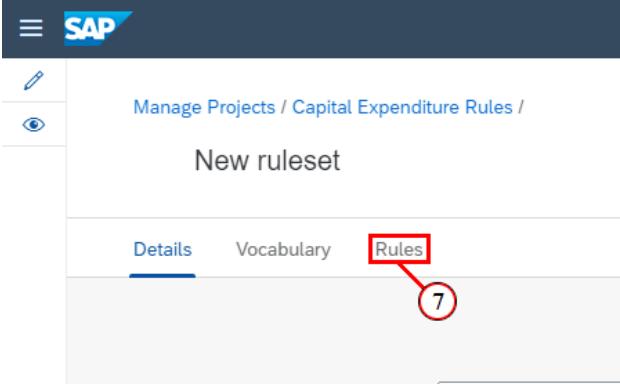
	A	B	C	D	E
1	Project Name	CAPEX_00	Project Id	3a1bb6e5b3446f5906a15aacc73c4	
2	Role Name	DetermineApproversRule	Rule Id	fbba21525cc4e718ed071339b5fc58d	
3	Investment Country	Investment Type	Investment TotalCost	Result	
4	IsEqual			cm_userid	lm_userid
5	'Germany'	'Software'	> 100	Vipin.rao000*	Vipin.rao000*
6			[ 200 .. 1000 ]	Varun.rao.001*	Varun.rao.001*
7	'India'		> 1000	Varun.rao.001*	Varun.rao.012*
8			EXISTIN [ 100 .. 500 .. 1500 ]	frank.mathew.023*	frank.mathew.023*
9			> 2000	frank.mathew.023*	peter.collins.1441*
10	'United States of America'	'Building'			Yma.hanis.001*
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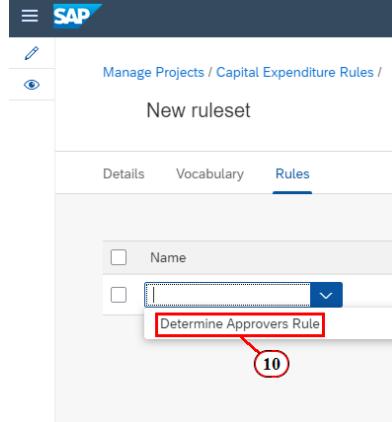
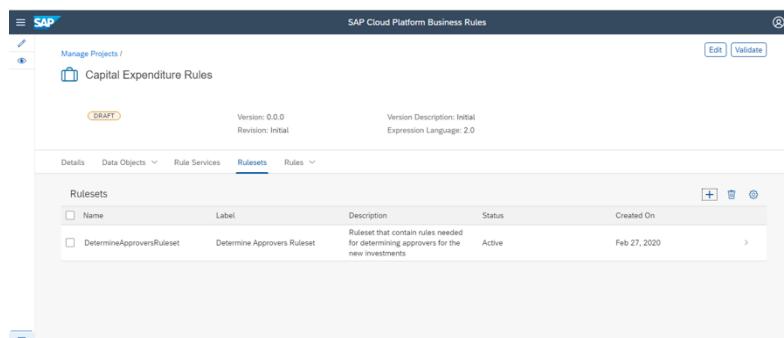
Explanation	Screenshot										
<p>110. Click to open the rule.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> <th>Created</th> </tr> </thead> <tbody> <tr> <td>DetermineApproversRule</td> <td>Determine Approvers Rule</td> <td>Rules to determine approvers for the new investments based on type, country and total cost of the investment</td> <td>Inactive</td> <td>Feb 27,</td> </tr> </tbody> </table>	Name	Label	Description	Status	Created	DetermineApproversRule	Determine Approvers Rule	Rules to determine approvers for the new investments based on type, country and total cost of the investment	Inactive	Feb 27,
Name	Label	Description	Status	Created							
DetermineApproversRule	Determine Approvers Rule	Rules to determine approvers for the new investments based on type, country and total cost of the investment	Inactive	Feb 27,							
<p>111. Click <b>Import</b>.</p>											
<p>112. Click <b>Browse...</b> and select the excel sheet updated in steps above.</p>											
<p>113. Click <b>Import</b>.</p>											

Explanation	Screenshot																																										
You will have the rows imported in your decision table.	<table border="1"> <thead> <tr> <th colspan="2">If</th> <th colspan="4">Then</th> </tr> </thead> <tbody> <tr> <td>Investment.Count...</td> <td>Investment.Type =</td> <td>Investment.Total C...</td> <td>Central Manager U...</td> <td>Local Manager Us...</td> <td>Local Manager Ap...</td> </tr> <tr> <td>'Germany'</td> <td>'Software'</td> <td>&gt; 100</td> <td>'ibpmuser000'</td> <td>'varun.rao.001'</td> <td>'true'</td> </tr> <tr> <td>'India'</td> <td>'Software'</td> <td>IN [ 200 .. 1000 ]</td> <td>'kiran.shah.012'</td> <td>'false'</td> <td>'true'</td> </tr> <tr> <td>'India'</td> <td>'Software'</td> <td>&gt; 1000</td> <td>'varun.rao.001'</td> <td>'kiran.shah.012'</td> <td>'true'</td> </tr> <tr> <td>'United States ...'</td> <td>'Building'</td> <td>EXISTSIN [ 100 ... ]</td> <td>'frank.mathew.0...</td> <td>'peter.collins.14...</td> <td>'true'</td> </tr> <tr> <td>'United States ...'</td> <td>'Equipment'</td> <td>&gt;= 2500</td> <td>'frank.mathew.0...</td> <td>'nina.hanks.001'</td> <td>'true'</td> </tr> </tbody> </table>	If		Then				Investment.Count...	Investment.Type =	Investment.Total C...	Central Manager U...	Local Manager Us...	Local Manager Ap...	'Germany'	'Software'	> 100	'ibpmuser000'	'varun.rao.001'	'true'	'India'	'Software'	IN [ 200 .. 1000 ]	'kiran.shah.012'	'false'	'true'	'India'	'Software'	> 1000	'varun.rao.001'	'kiran.shah.012'	'true'	'United States ...'	'Building'	EXISTSIN [ 100 ... ]	'frank.mathew.0...	'peter.collins.14...	'true'	'United States ...'	'Equipment'	>= 2500	'frank.mathew.0...	'nina.hanks.001'	'true'
If		Then																																									
Investment.Count...	Investment.Type =	Investment.Total C...	Central Manager U...	Local Manager Us...	Local Manager Ap...																																						
'Germany'	'Software'	> 100	'ibpmuser000'	'varun.rao.001'	'true'																																						
'India'	'Software'	IN [ 200 .. 1000 ]	'kiran.shah.012'	'false'	'true'																																						
'India'	'Software'	> 1000	'varun.rao.001'	'kiran.shah.012'	'true'																																						
'United States ...'	'Building'	EXISTSIN [ 100 ... ]	'frank.mathew.0...	'peter.collins.14...	'true'																																						
'United States ...'	'Equipment'	>= 2500	'frank.mathew.0...	'nina.hanks.001'	'true'																																						
114. Click <a href="#">Edit</a> .																																											
115. Click <a href="#">Activate</a> .																																											
116. Click <a href="#">Capital Expenditure Rules</a> .																																											

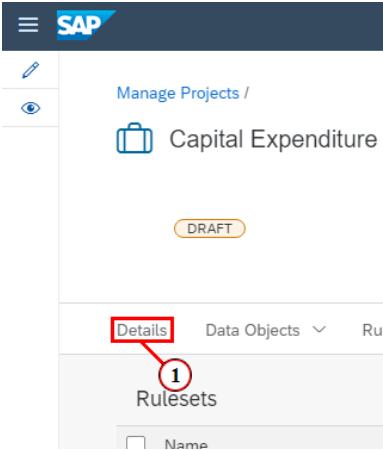
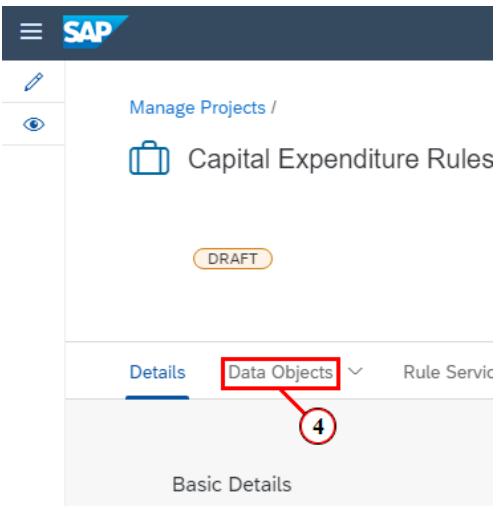
## CREATE RULESET

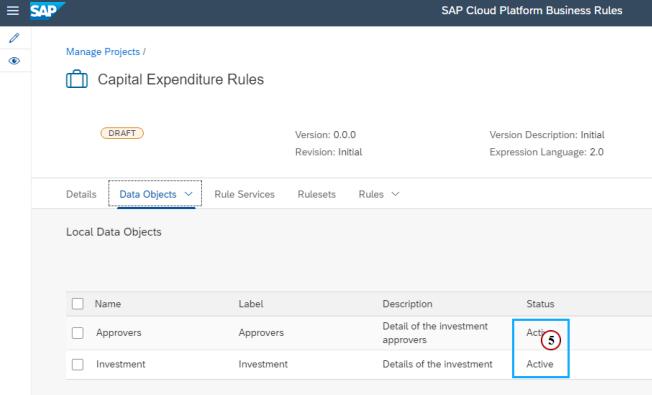
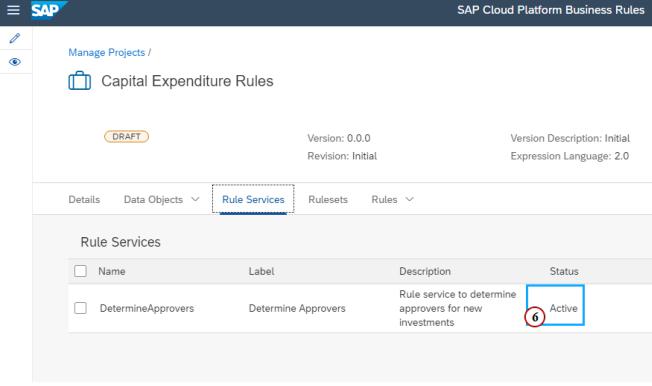
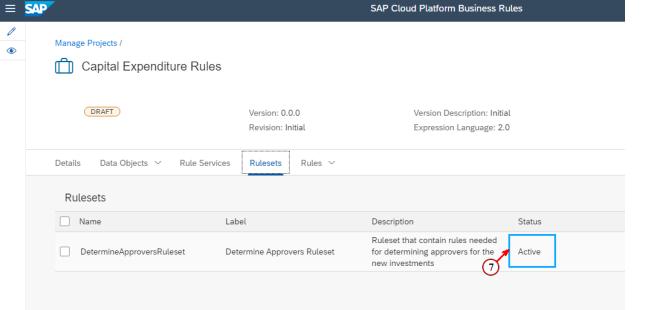
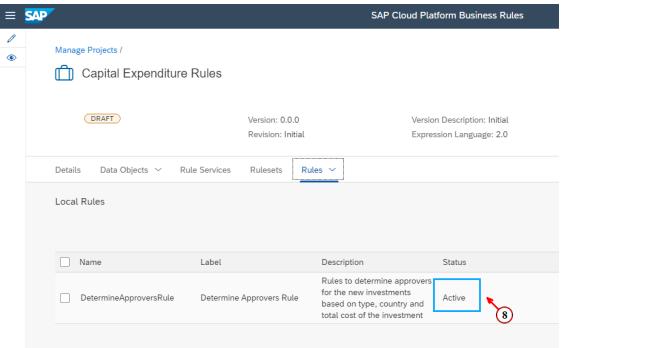
Explanation	Screenshot
<p>117. Click <b>Rulesets</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The top navigation bar has 'Edit' and 'Validate' buttons. Below it, there's a breadcrumb path 'Manage Projects / Capital Expenditure Rules'. A status bar indicates 'Version: 0.0.0 Revision: Initial Expression Language: 2.0'. The main area has tabs for 'Details', 'Data Objects', 'Rule Services', 'Rulesets' (which is highlighted with a red box and a circled '1'), and 'Rules'. Below these tabs, there's a section for 'Local Rules'.</p>
<p>118. Create Ruleset 119. Click .</p>	 <p>The screenshot shows the same SAP Cloud Platform Business Rules interface. The 'Rulesets' tab is still selected. A new row is being added, indicated by a plus sign icon and a circled '2'.</p>
<p>120. Click to enter <b>DetermineApproversRuleset</b> in Name box.</p>	 <p>The screenshot shows the 'New ruleset' dialog. It has tabs for 'Details', 'Vocabulary', and 'Rules'. The 'Details' tab is selected. There are fields for 'Name' (with a circled '3'), 'Label', and 'Description'.</p>
<p>121. Click to enter <b>Determine Approvers Ruleset</b> in Label box.</p>	 <p>The screenshot shows the same 'New ruleset' dialog. The 'Label' field now contains the value 'DetermineApproversRuleset' (circled '4').</p>

Explanation	Screenshot
<p>122. Click to enter Ruleset that contain rules needed for determining approvers for the new investments in Description box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A red arrow labeled '5' points to the 'Description' input field, which contains the text: 'Ruleset that contain rules needed for determining approvers for the new investments'.</p>
<p>123. Click to select DetermineApprovers as Rule Service.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A red arrow labeled '6' points to the 'Rule Service' dropdown menu, which is set to 'DetermineApprovers'.</p>
<p>124. Click Rules.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A red box highlights the 'Rules' tab, and a red arrow labeled '7' points to it.</p>
<p>125. Click Add Rule.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A red box highlights the 'Add Rule' button, and a red arrow labeled '8' points to it.</p>

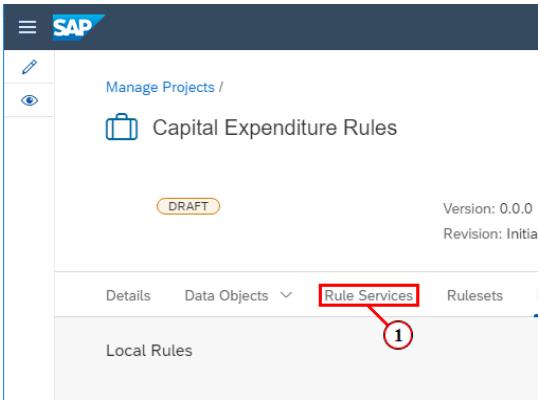
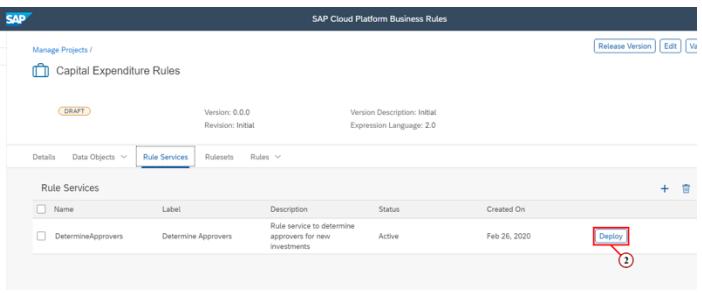
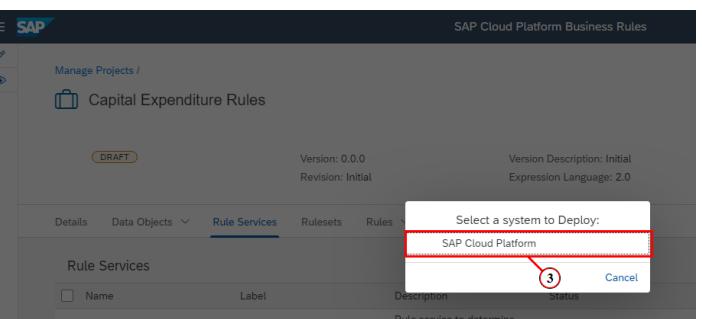
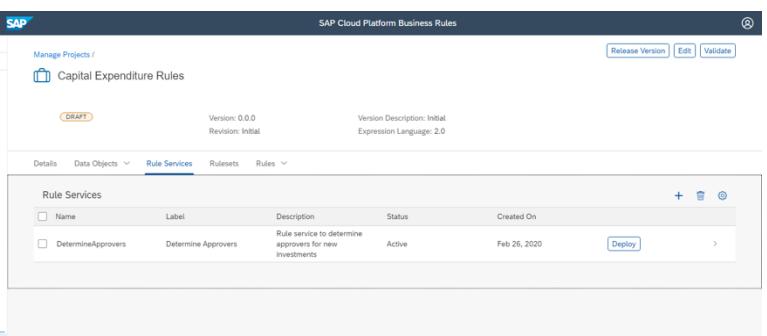
Explanation	Screenshot
126. Click <b>Insert First</b>	
127. Click to select Determine Approvers Rule	
128. Click <b>Activate</b>	
129. Click <b>Capital Expenditure Rules</b>	
You have created the ruleset, associated it with rule service and added the rule. Ruleset is a collection of rules of similar output.	

## ACTIVATE RULES PROJECT

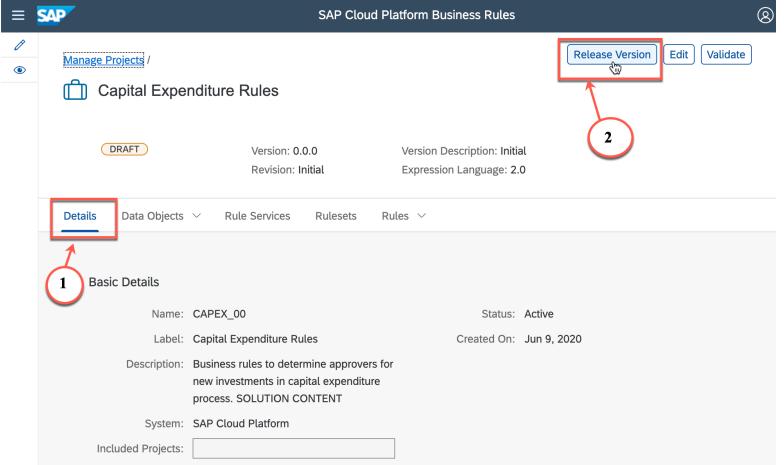
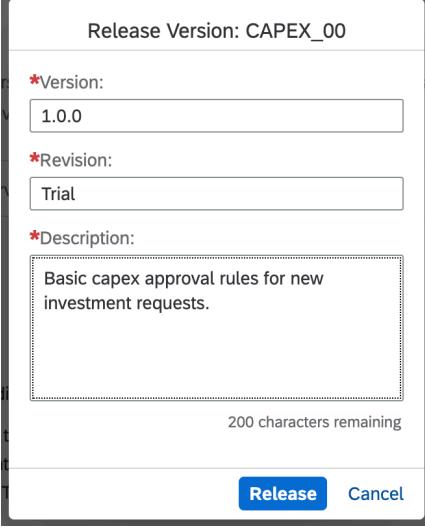
Explanation	Screenshot
<p>Before you deploy the rule service, all the rule entity models have to be in activated state. In this chapter, you will go through all the models to ensure that they are activated.</p> <p>130. Click <b>Details</b>.</p>	
<p>131. Click <b>Edit</b>.</p>	
<p>132. Click <b>Activate</b>.</p>	
<p>133. Click <b>Data Objects</b>.</p>	

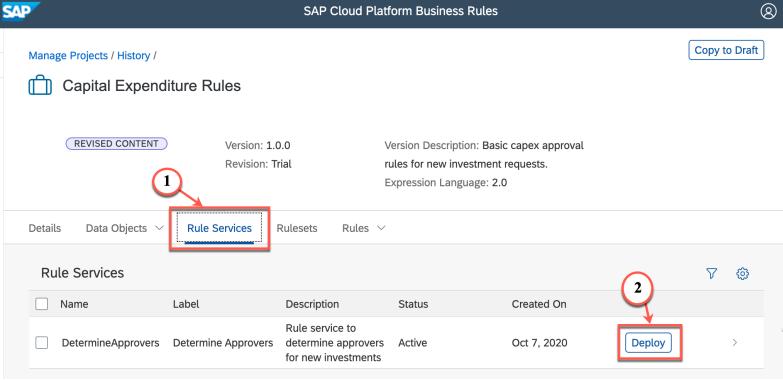
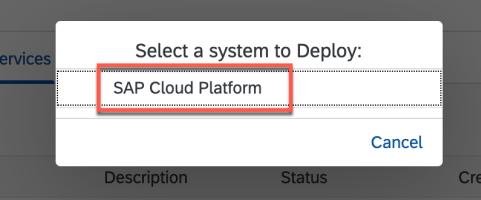
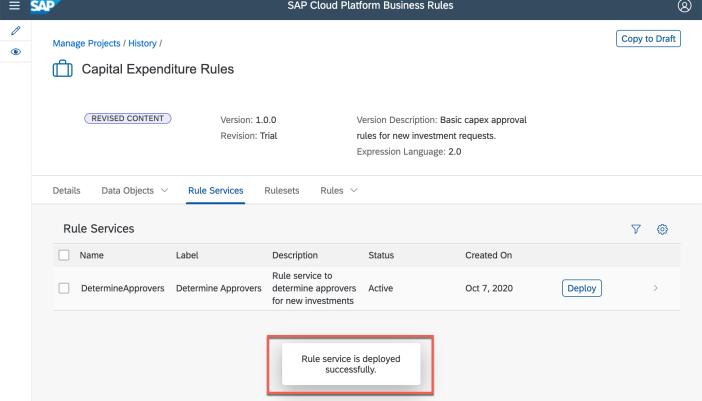
Explanation	Screenshot												
<p>134. Check if all the data objects are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Approvers</td> <td>Approvers</td> <td>Detail of the investment approvers</td> <td>Active (5)</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 (5)	Investment	Investment	Details of the investment	Active
Name	Label	Description	Status										
Approvers	Approvers	Detail of the investment approvers	Active (5)										
Investment	Investment	Details of the investment	Active										
<p>135. 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 (6)</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApprovers	Determine Approvers	Rule service to determine approvers for new investments	Active (6)				
Name	Label	Description	Status										
DetermineApprovers	Determine Approvers	Rule service to determine approvers for new investments	Active (6)										
<p>136. 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 contains rules needed for determining approvers for the new investments</td> <td>Active (7)</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contains rules needed for determining approvers for the new investments	Active (7)				
Name	Label	Description	Status										
DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contains rules needed for determining approvers for the new investments	Active (7)										
<p>137. 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 (8)</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 (8)				
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 (8)										

## DEPLOY RULE SERVICE

Explanation	Screenshot
<p>138. Click Rule Services.</p>	
<p>139. Click Deploy.</p>	
<p>140. Click SAP Cloud Platform to deploy the rule service.</p>	
<p>141. After the ruleset is deployed successfully, you will see the message. Now, the rule service can be consumed via the REST APIs</p>	

## CREATE VERSION

Explanation	Screenshot
<p>142. Click on <b>Details</b> tab</p> <p>143. 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. A red box highlights the 'Details' tab in the navigation bar. Another red box highlights the 'Release Version' button in the top right corner. A circled number '2' points to the 'Release Version' button.</p>
<p>144. 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>145. Click <b>Release</b></p>	 <p>The screenshot shows a 'Release Version' dialog box. It contains three input 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>146. To view the version created, <b>navigate back</b> to main page by clicking on Manage Projects link on top-left corner of the screen</p> <p>147. Click the <b>checkbox</b> of the business rules project for which you created the version.</p> <p>148. Click <b>History</b>.</p>	 <p>The screenshot shows the 'Manage Projects' page. A red box highlights the checkbox next to the 'CAPEX_00' project row. Another red box highlights the 'History' button in the top right corner of the table header. A circled number '2' points to the 'History' button.</p>

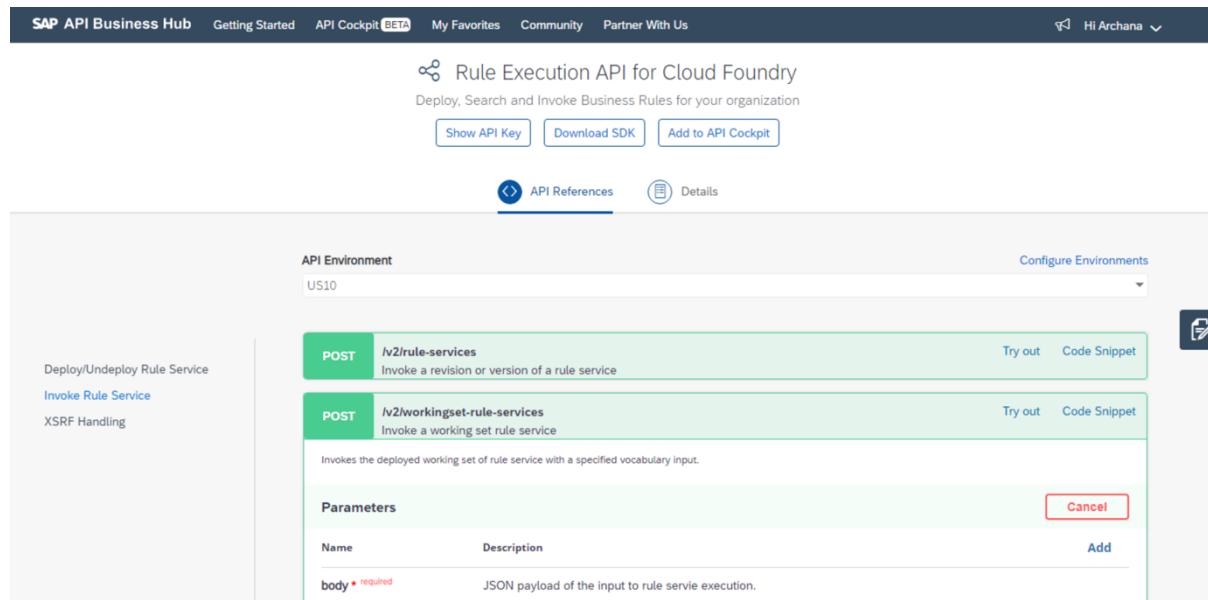
Explanation	Screenshot										
<p>You will see all the versions of the rule Project created here.</p> <p>149. Click to navigate into version 1.0.0</p>	 <table border="1"> <thead> <tr> <th>Version</th> <th>Revision</th> <th>Description</th> <th>Changed By</th> <th>Changed On</th> </tr> </thead> <tbody> <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>150. Click <b>Rule Services</b> tab.</p> <p>151. Click <b>Deploy</b>.</p>											
<p>152. Click <b>SAP Cloud Platform</b> to deploy the rule service.</p>											
<p>153. 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 search bar with the placeholder "Rule Execution API for Cloud Foundry" and a subtitle "Deploy, Search and Invoke Business Rules for your organization". There are three buttons below the search bar: "Show API Key", "Download SDK", and "Add to API Cockpit". Underneath this, there are two tabs: "API References" (which is selected) and "Details". The main content area is titled "API Environment" with "US10" selected. It lists two API endpoints:

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

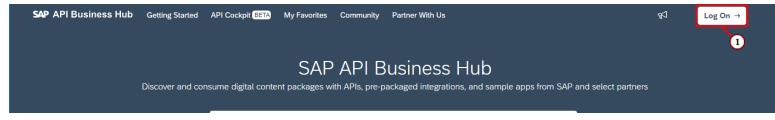
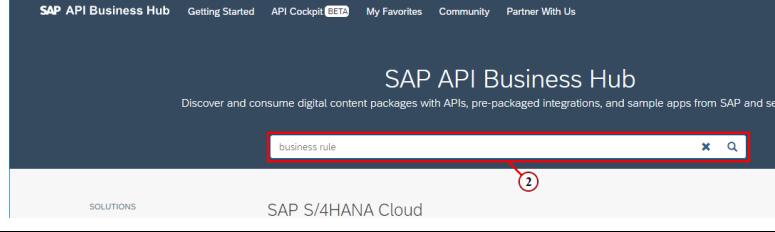
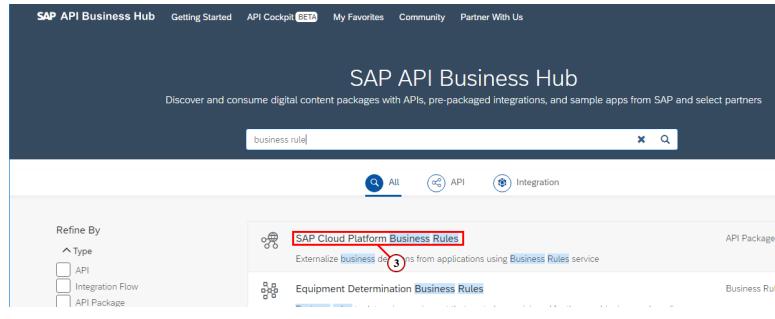
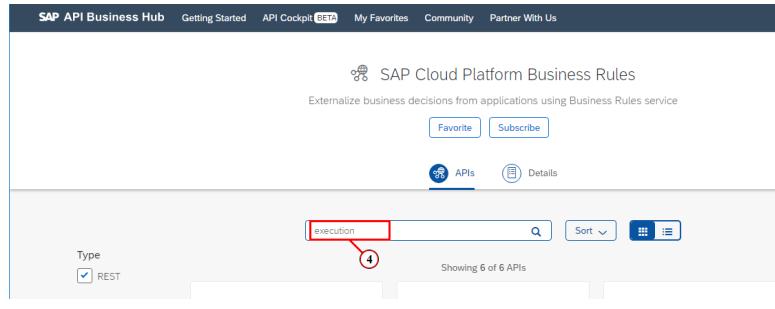
For the first endpoint, there is a note: "Invokes the deployed working set of rule service with a specified vocabulary input." Below the endpoints, there is a section titled "Parameters" with a "Cancel" button. It shows a table with columns "Name" and "Description". A row for "body" is marked as required and has a note: "JSON payload of the input to rule service execution." To the right of the table is an "Add" button.

### Exercise Description

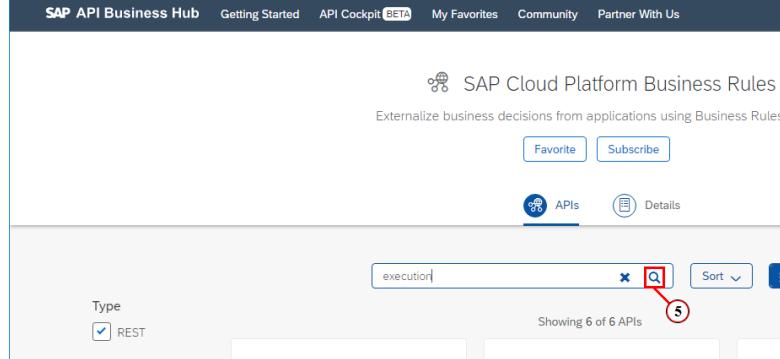
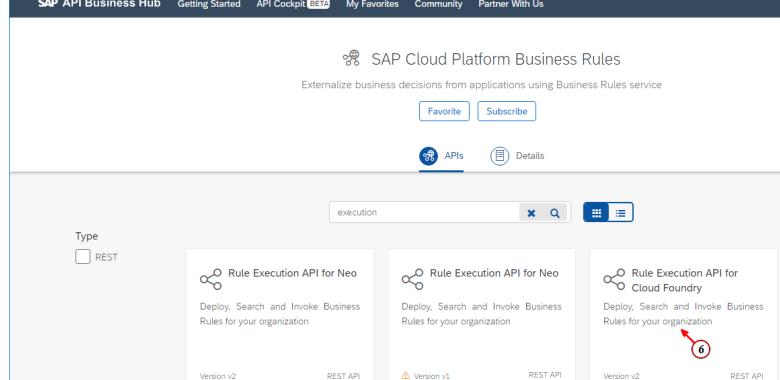
In this exercise you will do the following:

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

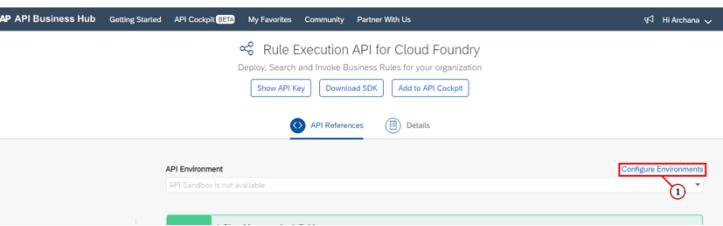
## DISCOVER BUSINESS RULES API

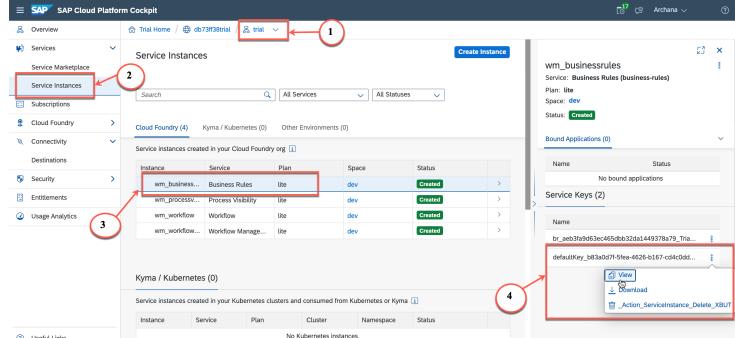
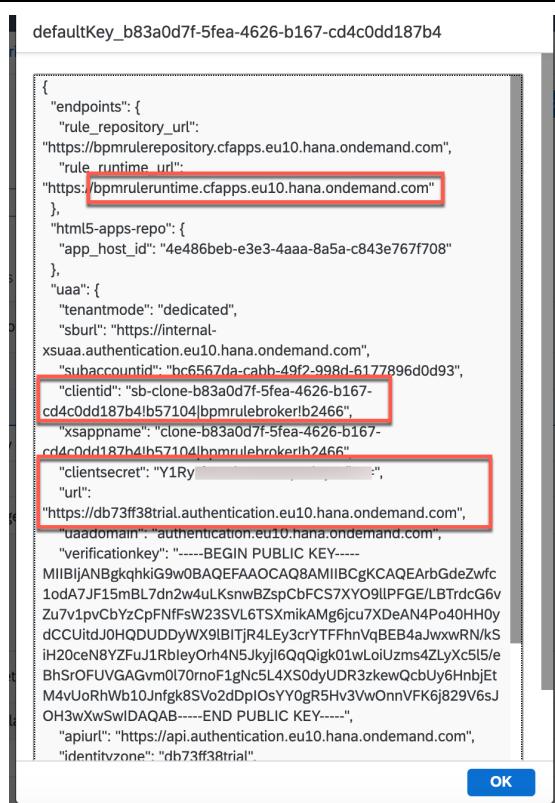
Explanation	Screenshot
<p>154. Open <b>API Business Hub</b> using this URL: <a href="https://api.sap.com">https://api.sap.com</a></p> <p style="text-align: center;"><b>Log On →</b></p> <p>155. Click <b>Log On</b>.</p>	
<p>156. using your S or P user ID</p>	
<p>157. Search Business Rules API  158. In <b>Search</b> box, enter <b>business rule</b> and press <b>Enter</b> key to search.</p>	
<p>159. Click <b>SAP Cloud Platform Business Rules API Package</b>.</p>	
<p>160. Enter <b>execution</b> in the  box.</p>	

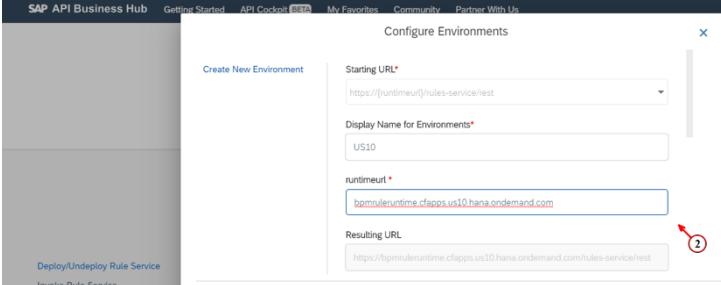
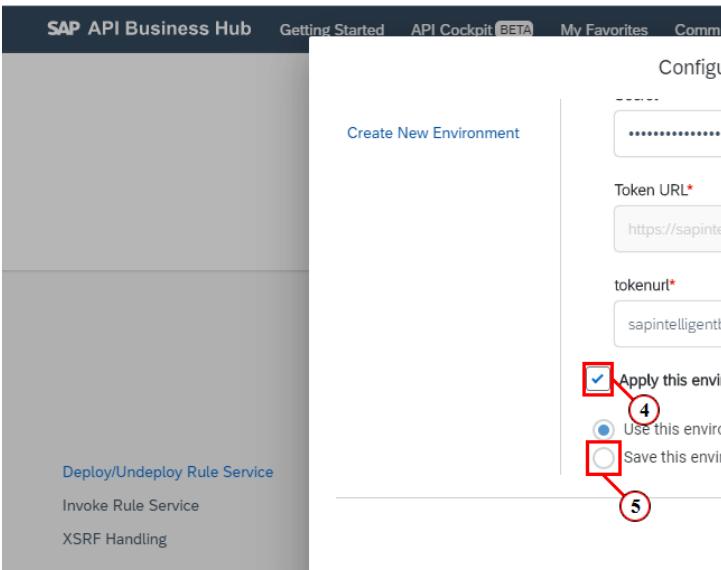
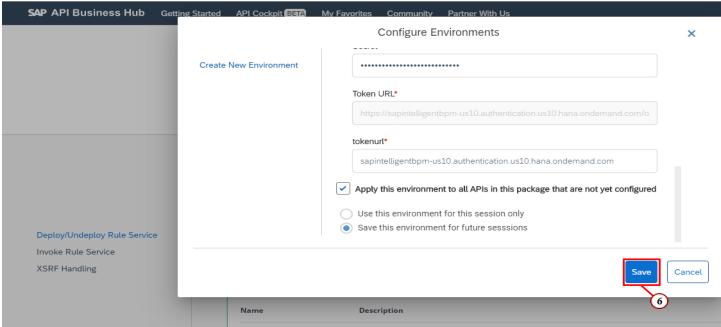
## DEV163 - Build a Workflow from Scratch with SAP Cloud Platform Workflow Management

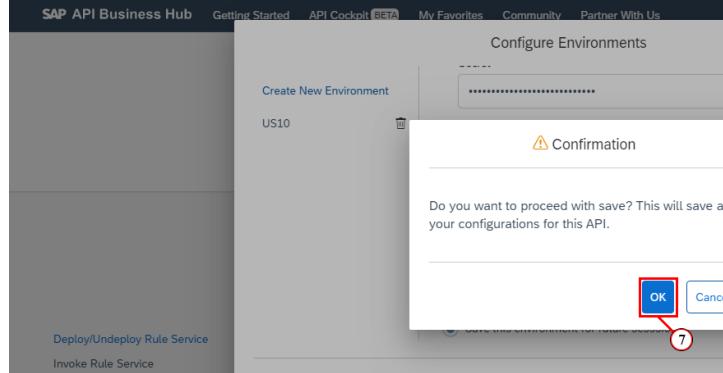
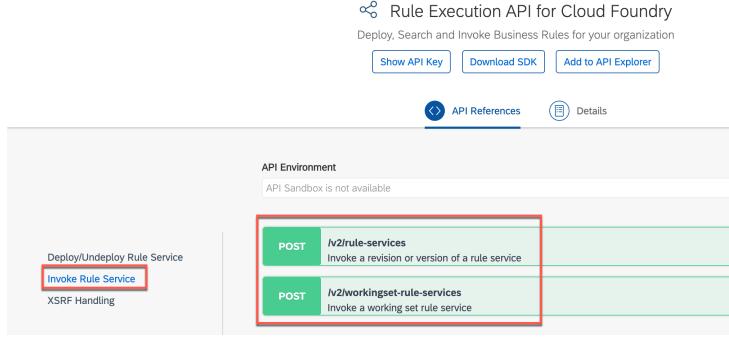
Explanation	Screenshot
<p>Note: Business Rules have two set of APIs: Authoring and Execution. You will also notice two set of versions v1 and v2. Version v1 is currently deprecated and will soon be unsupported.</p> <p>161. Click  to search the execution APIs.</p>	
<p>162. Click on <b>Rule Execution API for Cloud Foundry</b> version v2 APIs.</p>	

## CONFIGURE TEST ENVIRONMENT

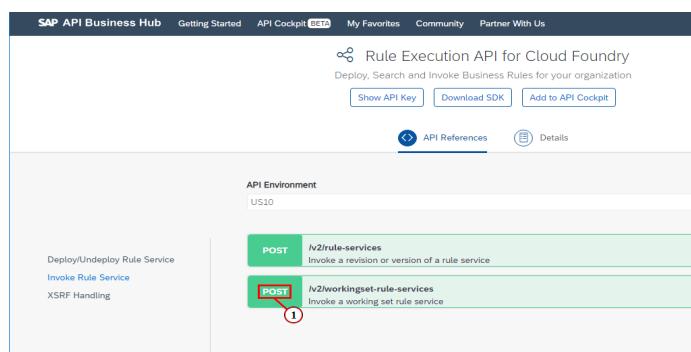
Explanation	Screenshot
<p>163. Click <a href="#">Configure Environments</a>.</p>	

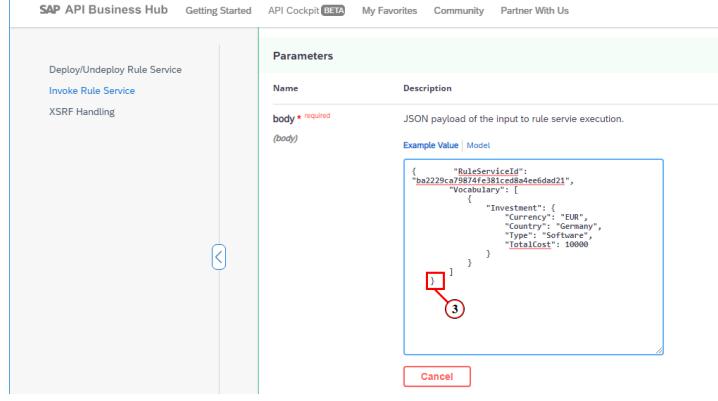
Explanation	Screenshot
<p>Fetch the information from Business Rules service instance key to configure the API Hub environment. To do so,</p> <p>164. Login to your cloud platform trial account and navigate into your sub-account.</p> <p>165. From left panel, click <b>Service Instances</b>.</p> <p>166. From among the available instances, click on <b>wm_businessrules</b> instance to view service keys.</p> <p>167. From available service keys, click  on any service key and select <b>View</b>.</p>	
<p>168. Copy the</p> <ul style="list-style-type: none"> <li>○ <b>rule_runtime_url</b>,</li> <li>○ <b>clientid</b>,</li> <li>○ <b>clientsecret</b>,</li> <li>○ <b>url</b> (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://bpmrulerrepository.cfapps.eu10.hana.ondemand.com",     "rule_runtime_url": "https://bpmruleruntime.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": "1RY-----",   "url": "https://db73ff38trial.authentication.eu10.hana.ondemand.com",   "uaadomain": "authentication.eu10.hana.ondemand.com",   "verificationkey": "-----BEGIN PUBLIC KEY-----\nMIIBjANBkgqhkIG9w0BAQEFAOCAQ8AMIBCgKCAQEArbGdeZwf\n1odA7JF15mB7dn2w4uLKnswBzSpCbFCS7XYO9lIPFGE/LBTrdcG6v\nZu7v1pCvbYzCpFNfFsW23SVL6TSMikAMg6icu7XDeAN4Po40HOy\ndCCUiIdJ0HQDUDdyWX9lBTjR4LEy3crYTFHnVqBEB4aJwxwRN/kS\niH20ceN8YZFuJ1RbleyOrh4N5JkjjI6QqQigk01wLuiUzms4ZLyxc5i5/e\nBhSrOFUVGAvgm0l70rn0F1gNc5L4XS0dyUDR3zkewQcbUy6HnbjEt\nM4VuOrhWb1.0Jngk8SVo2dDplOsYY0gr5Hv3VwOnnVFK6j829V6sJ\nOH3wXwSwIDAQAB-----END PUBLIC KEY-----",   "apiurl": "https://api.authentication.eu10.hana.ondemand.com",   "identityzone": "db73ff38trial" }</pre>

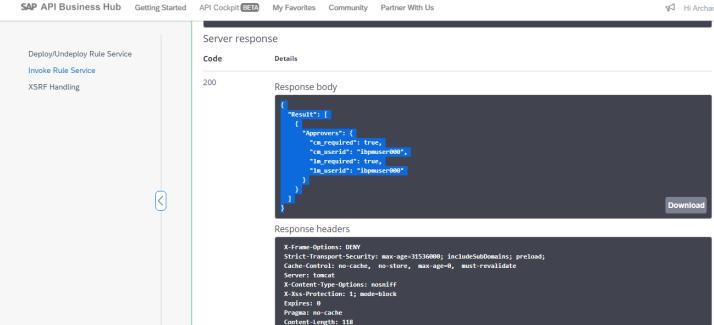
Explanation	Screenshot
<p>169. Set configuration properties</p> <p>Enter the respective details in the configuration properties as copied from the business rules service key in previous step:</p> <ul style="list-style-type: none"> <li>• <b>Display Name:</b> Trial</li> <li>• <b>runtimeurl:</b> &lt;as 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>170. 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 https:// 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>171. Click  for <b>Apply this environment to all APIs.</b></p> <p>172. Click  for <b>Save this environment for future sessions.</b></p>	
<p>173. Click .</p>	

Explanation	Screenshot
<p>174. Click <b>OK</b>.</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>175. From the left options, click <b>Invoke Rule Service</b>.</p>	

## INVOKING BUSINESS RULES

Explanation	Screenshot
<p>176. Click <b>POST</b> of <b>/v2/working-set-rule-services</b> API.</p>	

Explanation	Screenshot
<p>177. Execute Working Set API</p> <p>178. Click <b>Try out</b>.</p>	
<p>179. Press <b>Tab</b> until you reach the <b>body</b> section.</p> <p>180. 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>181. Click <b>Execute</b>.</p>	

Explanation	Screenshot
<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": [     {       "Response": {         "IsRequired": true,         "IsService": "BusinessRules",         "IsRequired": true,         "IsService": "BusinessRules"       }     }   ] } </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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