



**Externalizing Input and Assert Expressions, Handling Error Scenarios, and Parameterization in MUnit** 

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#### Contents

1.	Handling Error Scenarios and externalizing input and assert expressions	1

2.	Parameterization	20	)
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# Handling error scenarios and externalizing input and assert expressions in MUnit

### **Objective:**

We are going to write test cases for the scenarios where the flow is going to throw errors.

### The application we are going to test is

/ test-case-2 😒	Database configuration
	Global Element Properties ×
· lookup-based-on-customer-name	Database Config Default configuration
Listener Linger Sinct Transform Message	General Advanced Notes Hetp
Logging query Fetching Transform to joon parameter customer data name	Connection MySQL Connection ~
	General Transactions Advanced Required Libraries
Error handling	Connection
On Error Continue type: DB:CONNECTIVITY	Host: 1/4 localhost
and the second second	Port: A 3306
	User // mot
Transform Message	Pessword: •••• Show persword Database: A muledb
* On Error Propagate type: ANY	Test Connection, OK Cancel
Transform	

### Query



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### Database

P	anult Cuid		Cites Revers	1
N			Hiter Nows:	
	CustId	CustName	OrderQty	
۲	100	Yuvraj	10	
	101	Adrish	20	
	102	Yuvraj	5	
	HULL	NULL	MULL	

### **Postman Request and response**



### Error handler "transform messages"

### **DB:CONNECTIVITY**



### **MULE:ANY**



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**Step 1:** Select the flow you want to test ("lookup-based-on-customer-name") then right-click on the flow and click on "MUnit" then "Create blank test for this flow". This creates a blank test flow where you can write your test cases and also it creates a test suite.



**Step 2:** Now drag and drop a "Set Event" processor from the "MUnit" module in the mule pallet before the flow reference in the execution part of the test flow.



**Step 3:** Now we need to externalize the values we are going to set in the "Set event". We need to create a package in "src/test/resources".

Right-click on "src/test/resources" and then on "new" and then on "package".

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- 21 src/r							
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- 6	escja metos		Open Type Hierarchy	F4	00	Project from Example	
and in	0042		Show In	Alt+Sh/T+W >	12	Java Project	
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Creates i Source f Na <u>m</u> e: Creat	ol <u>d</u> e te pa	er: acka	test-case getcusto ge-info.java comments (configure	2/src/test/resol merbyname.dbc r templates and	urces conne defa	ctivity	Browse
Creates I Source f Name: Creat	olge te pa	er: acka	test-case getcusto ge-info.java comments (configure	2/src/test/resol merbyname.dbc r templates and	urces onne defa	ctivity ult value <u>here</u> )	Browse

Put the package name as "getcustomerbyname.dbconnectivity" and click on finish.



# **Step 4:** Now right-click on the package "getcustomerbyname.dbconnectivity" then "New" and then file

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2 9 2 9 2 9 3 9 4 9 5 9 7 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	<ul> <li>Herl-cate-2umi</li> <li>Herl-main/Hesources</li> <li>Sc/Test/Hesources</li> <li>Sc/Test/Hesources</li> <li>Sc/Test/Hesources</li> <li>Sc/Test/Hesources</li> <li>Sc/Test/Hesources</li> <li>Sc/Test/Hesources</li> <li>Database (v1.14.7)</li> <li>Hittl9 (v1.9.0)</li> <li>HE System Library (</li> <li>Mular Server 4.3.3 ES</li> <li>Mular (v1.0.0)</li> <li>Mular (v1.0.0)</li> </ul>		New Open in New Window Open Type Hierarchy Show In	F4 Alt+Shift+W 2	3 4 8 3 4	Mule Project API Specification Project Project from Template Mule Domain Project Project	÷.	
		8 4 5 X	Copy Copy Qualified Name Paste Delete	Ctrl+C Ctrl+V Delete	PK UE	Avia Project Project		
M RE Mui		au n Library Build Path er 4.5.3 EE Source Alti-Shifti-5 0.00 Refactor Alti-Shifti-1	) Alt+Shift+S ) Alt+Shift+T )		FAML API Fragment File     Fackage     Class			
Bi Proj	ect Libraries lets [v1.2.4]	10.12	Import Export		0	Interface Enum		
Outine	APlkit Corec There is no da	*	Retresh Assign Working Sets	15		Source Folder Java Working Set		
		¥ @ 4	Mule Manage Dependencies Anypoint Platform	3 3 3	N II O	Folder File Untitled : Onatte a new file resource	init Errors	b s

Then give the file name as "event\_attributes.dwl" and click finish.

Conste New File	a x	∽ 🦞 test-case-2
File Create a new file resource.	E	<ul> <li>src/main/mule (Flows)</li> <li>test-case-2.xml</li> </ul>
Enter or select the parent kolder test-case-2/sec/test/resources/getrustomertyname/dbcomectivity () = = = = = = = = = = = = = = = = = = =		<ul> <li>Brc/main/java</li> <li>Brc/main/resources</li> <li>src/test/java</li> <li>Src/test/resources</li> <li>log4j2-test.xml</li> <li>Egetcustomerbyname.dbconnectivity</li> <li>event_attributes.dwl</li> </ul>
Hie name: _event_athioutes.dw		<ul> <li>Src/test/munit</li> <li>test-case-2-test-suite vml</li> </ul>
1 Ente	h Cancel	

Now double-click on the "event\_attributes.dwl" it opens the file. Paste this expression below

{ qu	<pre>leryParams:{     name:"Yuvraj"</pre>	
}		
🖌 test-ca	se-2 🖌 *test-case-2-test-suite	{/} *event_attributes.dwl $\times$
101		
1 L	- (	
20	queryParams:{	
3	name:"Yuvraj"	
4	}	
5 }		

And save the file.

Step 5: Now we need to refer to this in the "Set event" processors attributes section.

Now go to the attributes section in the "Set event" processor and click on the expression mode in "value" (highlighted as 1) then click on the button highlighted as 2.

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Set Event :	Console EPoblems WMUnit Errors 19 Mule Debugger
General	C There are no errors.
Metadata	Display Name: Set Event
Notes Help	Set Event Define the new event that will be output by this operation Start with an empty event C Clone the incoming event and override values
	Payload Atributes Error Variables
	Encoding:

### Then copy and paste this expression

Set Event - Console A Problems	WM.Int WMUnit Errors @ Mule Debugg	
General +		00 CD CD Preview Down
Press Payload Likenown <u>Define metadata</u> Vanables Attributes Unincen Define	K.	<pre>1 : readUtl{"classpath://getnutcestkynaze/docommetivity/event_sttributes.dul") =</pre>

Then click on done

**Step 5:** Now drag and drop an "Assert Expression" from the "MUnit Tools" module in the mule pallet to the "Validation" section of the test flow.



Step 6: Now we need to externalize the expression we are going to assert

Now create a file with the name "assert\_payload.dwl" in "getcustomerbyname.dbconnectivity"

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v	Y	test-case-2
	v	🐸 src/main/mule (Flows)
		🖌 test-case-2.xml
		🕮 src/main/java
	>	B src/main/resources     Src/main/re
		B src/test/java     S
	v	B src/test/resources
		🖹 log4j2-test.xml
		<ul> <li>B getcustomerbyname.dbconnectivity</li> </ul>
		{/} assert_payload.dwl
		{/} event_attributes.dwl
	v	😕 src/test/munit
		🖌 test-case-2-test-suite.xml
		-

Open the "assert\_payload.dwl" file and paste the expression below

```
import * from dw::test::Asserts
payload must equalTo({
      Status: 200,
      Message: "cannot connect to database"
})
🖌 test-case-2
              ¥*test-case-2-test-suite
                                    {/} event_attributes.dwl
                                                         {/} *assert_payload.dwl ×
 10 import * from dw::test::Asserts
 2 ----
 3 payload must equalTo({
       Status : 200,
 4
        Message : "cannot connect to database"
 5
 6 })
```

Now save the file

Step 7: Now we need to refer to this file in "Assert Expression"

Copy and paste the expression below expression in "Expression" section of assert expression.

import getcustomerbyname::dbconnectivity::assert\_payload \_\_\_\_ assert payload::main({payload:payload,attributes:attributes,vars:vars})

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(address of the second	C Thère are n	errora. Ir	Output Output
mor Mapping	Display Name	Jasen expression	,P type fitter text
otes	General		v Reviced
ela.	Expression	Isimport quroustmentyname::dbounnectivity::assert_payload     A N     A sett_payload::main((payload:phyloed,attributes:attributes,vars:main))     A	Object: Object: w Attributes Void / Void Writables
	Mestage	Assertion taked	
	0.000000		

**Step 8:** Now we need to mock the database "component" to throw a "DB:CONNECTIVITY" error.

Drag and drop a "Mock when" in the "Behavior" section of the test flow from the "MUnit Tools" module in the mule pallet.

When case-2 Whest-case-2-1	est-sure : Wevent_attributes.dwl Wassert_payload.dwl	Mule Palette =	
		P Search in palette	Orn O
* test-case-2-test-saile lookup-to Behavio Mook wh	sed-oo-outromer-nameTest. x	00 Search in Excha     Operations       F Add Modulas     Resert equation       Favorities     Assert equation       Core     Assert texpression       Database     Michael that       Database     Michael that       FitTP     Michael that	ĺ
Set Event	Validation Againt expression	Michail     M	

**Step 9:** Now go to mock when and click on "Pick processor" then select "fetching customer data" and then select "doc:id"

eef to	Pick a target processor Select a target processor from the Flow Dutline ar execution. The MUnit operation will run whenever executed in the Bow.	d choose attributes a processor with m	to match against during atching name and attribute sustomer data	× a test utes is	G HTTP G MUlai MUlai G Socke
-Date tome me role e 'pro ame:	Test-case-2, Mile Configuration     Elstener: Lationer     Elstener: Lationer     Elstener: Lationer     Effecting outcomer data/Selier     Effecting outcomer data/Selier     Effect handling: enru-handler     Enor han	dochame docid	Foliabing publiches da anexatine <u>Chec</u> Alle Duhathane Confre	9077-1-	
en a		Whe	OK Cance	el	Pick processor

Then click on "OK"

**Step 10:** Then go to the "Error" section in "Then return" in "Mock when" and paste the expression below in "TypeId"

### **DB:CONNECTIVITY**

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**Step 10:** Now save the project and we need to run the test case. Double-click on the test flow right-click and then click on "Run MUnit test".

test-rese-t	B 1050-0450-2-1051-5	une :	wrevent adarbates own	A) gase (Dahoso tawi
* test-case-2-to	est-suite-lookup-based	-011-0	ustomer-nameTest	
	Behavior	0	Run MUnit test	
			Debug MUnit test	Run this Münit Suite
		W	Ignore test	
	Mock when	.12	lignore other tests.	
E	xecution	0	Undo Apply changes to Mo	ck when
		10	Redo	
	- 689	9.	Ga To XML	
Set Event	Flow Historitics	×	Delete	
	<b>∓low-ref</b> to	2	Rename	
	lookup-based- on-cuitomer-		Toggle Comment	Cb1+7
	name	4	Clear DataSense Metadata	
			Add breakpoint	

You will see the test case will successfully pass.

Ctest-case-2-lest-suite-inokup .		oblems WMUnit -	White Errors P Mule Debugger		9. m   0. m = 0
Run 1/1	_		Enors 0	• Failures 0	
Sort by O Sute Name O Deto	ut :				
🖓 test-case-2-best-outle.xmi					

In the above scenario, we are testing the error which is handled by "on error continue". Now in the second scenario, we are going to test the errors that are handled by "on error propagate".

### **Objective:**

Writing the test cases for the scenario where the error is handled by "on error propagate".

**Step 1:** Select the flow you want to test ("lookup-based-on-customer-name") then right-click on the flow and click on "MUnit" then "Create blank test for this flow".

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· lookup-baseti-on	customer name							
P	han project test-case-2							
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8.0	collapser Others							
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emage Row Gran	Pre Finne Binnerswer Pre Finne Binnerswer 2 - test - suite - looku Bel Add mocks	p-based havior	Record tes	ner-nam	e More to e Test 1	ann Flair fur i	turt writing yo	ur Mührt te
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tesspe Row The test-case- Executor Flow Re Flow Re Flow Re Flow Re	2-test-suite-looku Bel Add mocks tion	p-based havior and spin	-on-custon -on-custon to here Validation	ner-nam	neTest1	ate The to s	tet avtilig jo	ur Münt te
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**Step 2:** Now drag and drop a "Set Event" processor from the "MUnit" module in the mule pallet before the flow reference in the execution part of the test flow.

	Beh	avior
	Add model (	ind spies hnm
		Validation
Set Event	Flow Reference Flow-ref to lookup-based- on-customer- name	Add assertions and verifies here

**Step 3:** Now we need to externalize the values we are going to set in the "Set event". Create a package with the name "getcustomerbyname.any" in "src/test/resources"

(If you forgot the steps refer to the steps of the above scenario)



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- ¥ test-case-2
- - 🎽 test-case-2.xml
  - 🛎 src/main/java
- > 😕 src/main/resources
  - 🕮 src/test/java
- - 🗴 log4j2-test.xml
  - getcustomerbyname.any
  - getcustomerbyname.dbconnectivity
     {/} assert\_payload.dwl
     {/} event\_attributes.dwl

```
Step 4: Now create a file with name "event_attributes.dwl" in the package "getcustomerbyname.any".
```

V Y test-case-2
 V Src/main/mule (Flows)
 Y test-case-2.xml
 P src/main/java
 P src/main/resources
 P src/test/java
 P src/test/resources
 N log4j2-test.xml
 P getcustomerbyname.any
 (/) event\_attributes.dwl
 P getcustomerbyname.dbconnectivity

Now paste the expression below into that file and save it.

```
{
    'queryParams':{
        'name':"Yuvraj"
    }
}
```



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Step 5: Now we need to refer to this file in the attributes section of the "Set Event" processor

Paste the below expression in the attributes section of "Set event" processor.

readUrl("classpath://getcustomerbyname/any/event\_attributes.dwl")

Set Event x	Console 🐘 Problems 🙀 MUnit Errors 🍄 Mule Debugger	
General	There are no errors.	
Metadata	Display Name: Set Event	
Notes	Set Event	
Help	Define the new event that will be output by this operation	
	Start with an empty event     Clone the incoming event and override values	
	Payload Attributes Error Variables	
	Value: F readUrl("classpath://getcustomerbyname/uny/event_attributes.dwl")	1 III
	Media Type:	÷.
	Encoding:	4

**Step 6:** Now drag and drop an "Assert Expression" in the "validation" section of the test flow



Step 7: Now we need to externalize the expression we are going to assert

Now create a file with the name "assert\_payload.dwl" in "getcustomerbyname.any" itest-case-2
itest-case-2.xml

- B getcustomerbyname.any
  - {/} assert\_payload.dwl
  - {/} event\_attributes.dwl
- B getcustomerbyname.dbconnectivity

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Step 8: Now paste the below expression into that file and save it.

```
import * from dw::test::Asserts
payload must equalTo({
     Status : 500,
     Message : "MULE:ANY"
})
 {/} assert_payload.dwl ×
                       Vest-case-2
                                      {/} event
  10 import * from dw::test::Asserts
  2
  3 payload must equalTo({
  4
          Status : 500,
  5
         Message : "MULE:ANY"
  6 })
```

Step 9: Now we need to refer to this file in "Assert Expression"

Copy and paste the expression below expression in the "Expression" section of assert expression.

```
import getcustomerbyname::any::assert_payload
---
assert payload::main({payload:payload,attributes:attributes,vars:vars})
```

General	C There are no errors.		
Error Mapping	Display Name: Assert expression		
Notes	General		
Help	Expression = 1* import getcustomerbyname::any::assert_payload 2 2 assert payload::main((payload:payload, attributes:attributes, vars:vars))	*	£.

Step 10: Now we need to mock the database "component" to throw a "MULE: ANY" error.

Drag and drop a "Mock when" in the "Behavior" section of the test flow from the "MUnit Tools" module in the mule pallet.

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	Behavior	
Executio	Mock when	Validation
Set Event 110 F loc on	iow-ref to kup-based- -customer-	Assert expression

**Step 11:** Now go to "Mock when" and click on "Pick processor" then select "fetching customer data" and then select "doc:id"

eref to	Pick a target processor Select a target processor from the Flow Outline a execution. The MUnit operation will run whenever executed in the flow.	d choose attributes a processor with m	to match against during atching name and attribu	× s test stes is	HTTP     MUnit     MUnit     Socket
-baset tomer me iole e 'proi amet	Best-case-2 Mile Configuration     Biologia-based-on-customer-name     Bistener: Limone     Bistener: Limone     Beching customer data/Select     Bransform to json / Transform Me     Binor fanding: error-handler     @ On Error Continue: On Error C     @ Transform Message: Transf     @ On Error Propagate: On Error     @ On Error Propagate: On Error	Attributes for re docrame docid docid	Interface Control Cont	10. 9077-2	
en a name		Whe	OK Cance		Pick processor

Then click on "OK"

**Step 12:** Then go to the "Error" section in "Then return" in "Mock when" and paste the expression below in "TypeId"

MULE:ANY

🖲 Mock when	× 🖳 Cor	nsole    Pr	oblems	🖌 MUnit	Y MUnit Errors	参 Mule Debugger
	📀 There a	re no errors.				
General	Payload	Attributes	Error	Variables		
	Typeld:	MULE:ANY				
Metadata	Cause:					
Notes	cuuse.					
Help						

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Step 13: Now we need to wrap the flow reference in try-catch.

Right-click on the flow reference and go to wrap in then click on try.



Step 14: Now drag and drop a on error continue on the error handling section of the try-catch



Step 15: Now drag and drop a logger on the "On Error Continue" section.

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Now write "In on error continue" in the message section of the logger

Logger ::	Console Problems YMUnit WMUnit Errors *Mule Debugger
General	O There are no errors.
Metadata	Display Name: Logger
Notes	Generic Message: It. In on error continue
nep	Level: INFO (Default)
	Category:

(We are wrapping up the flow reference in try-catch because the error thrown in the main flow will be propagated to the flow reference because it is handled in "on error propagate" so the control will not go to "Assert expression" if not wrapped in try-catch)

**Step 16:** Now save the project and we need to run the test case. Double-click on the test flow right-click and then click on "Run MUnit test".

		0	Run MUnit suite Debug F <sub>Bun this MUnit Suite</sub>
	Mock when Execution • Try	0.0000	Dattice relected tests types relected tests Eacher other tests types other tests Undo Apply changes to Logge Bolo
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You will see the test case will successfully pass.

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# **Parameterization**

### **Objective:**

We are going to parameterize the event attributes and the expression we want to assert.

**Step 1:** Select the flow you want to test ("lookup-based-on-customer-name") then right-click on the flow and click on "MUnit" then "Create blank test for this flow".



**Step 2:** Now drag and drop a "Set Event" processor from the "MUnit" module in the mule pallet before the flow reference in the execution part of the test flow.

<ul> <li>test-case-2-t</li> </ul>	est-suite-lookup-bas Beh	ed-on-customer-nameTest2 avior
	Add mocks a	nd spies here
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Set Event	Flow Reference Flow-ref to lookup-based- on-customer- name	Add assertions and verifies here

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Step 3: To parameterize the attributes we need to write the expression below

```
{'queryParams':{'name': Mule::p('custname')}}
```

(p() function returns a string that identifies the value of one of these input properties: Mule property placeholders, System properties, or Environment variables)

Copy and paste the above expression in the "Attributes" section of the "Set Event"

Set Event x	Console 🗈 Problems 🗑 MUnit Multit Errors 🕸 Mule Debugger	
General	C There are no errors.	
Metadata	Display Name: Set Event	
Notes Help	Set Event Define the new event that will be output by this operation Start with an empty event Clone the incoming event and override values	
	Payload     Attributes     Error     Variables       Value:     Image: ['queryParams';('name'; Mule::p('custname')))]       Media Type:       Encoding:	\$1] [N ~ ~

Step 4: Now drag and drop an "Assert Expression" in the "validation" section of the test flow



Step 5: Now paste the below expression in the "Expression" section in "Assert expression"

```
import * from dw::test::Asserts
_--
payload must haveSize(Mule::p('size') as Number)
```







Error Mapping Display Name: Assert expression Notes General Help Lxpression:  Image: from dw::test::Asserts 2 2		
Notes General Help Expression: D 10 import * from dw::test::Asserts 2		
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Message: $\int x$ Assertion failed		

**Step 6:** Now we need to pass the parameters we mentioned in the p() function. Now go to "Global Elements" and select "MUnit Configuration" and click on Edit

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#### This window will pop up

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**Step 7:** click on the "+" button in the "Parameterization" section give the parameterization name as custname and click on "OK" (It can be any name under this we are going to define groups of parameters which we will pass)

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MUnit configuration		>
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**Step 8:** Now select custname and click on the "+" button on the "Parameter name and value" section. Add "Parameter name" ass custname and "Value" as Yuvraj and click on "OK".

8		×
Parameter Add a new paran	eter	
Parameter Name:	custname	
Value:	Yuvraj	
Value:	Yuvraj	

**Step 9:** Now add another parameter with "Parameter name" as size and "Value" as 2 and click on "OK".



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			×
Parameter Add a new paran	seter		
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Ø		ОК	Cancel

Step 10: Click "OK" In the Global Element Properties window

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◆ 전 ¥ % Parameterization custname	♦ 3 ¥ % Parameter Name size	Yalue Yuvraj 2

**Step 10:** Now you are going to see some errors in the "MUnit Configuration". This is occurring due to a bug in Anypoint Studio. Go to configuration XML you can see <munit:parameterization> is repeating.

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The tags highlighted in red are repeating. Now remove the tags and the errors will be gone.

(The number of elements repeating may differ, just removing the duplicates will solve the issue)

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Step 11: Now save the projects and run the test case

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#### You will see the test cases run successfully

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Step 12: Now change the value of "size" to 1 in the "Global Element Properties"





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Now click on "OK" and again click "OK" in "Global Element Properties" save the project and run the test case. You will see the test case fails.



This is because with the query parameter "Yuvraj" there are two 2 records in the database and we are giving the size as "1". Previously we gave the size as 2 that's why it passed.

You can see the reason in the error section



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