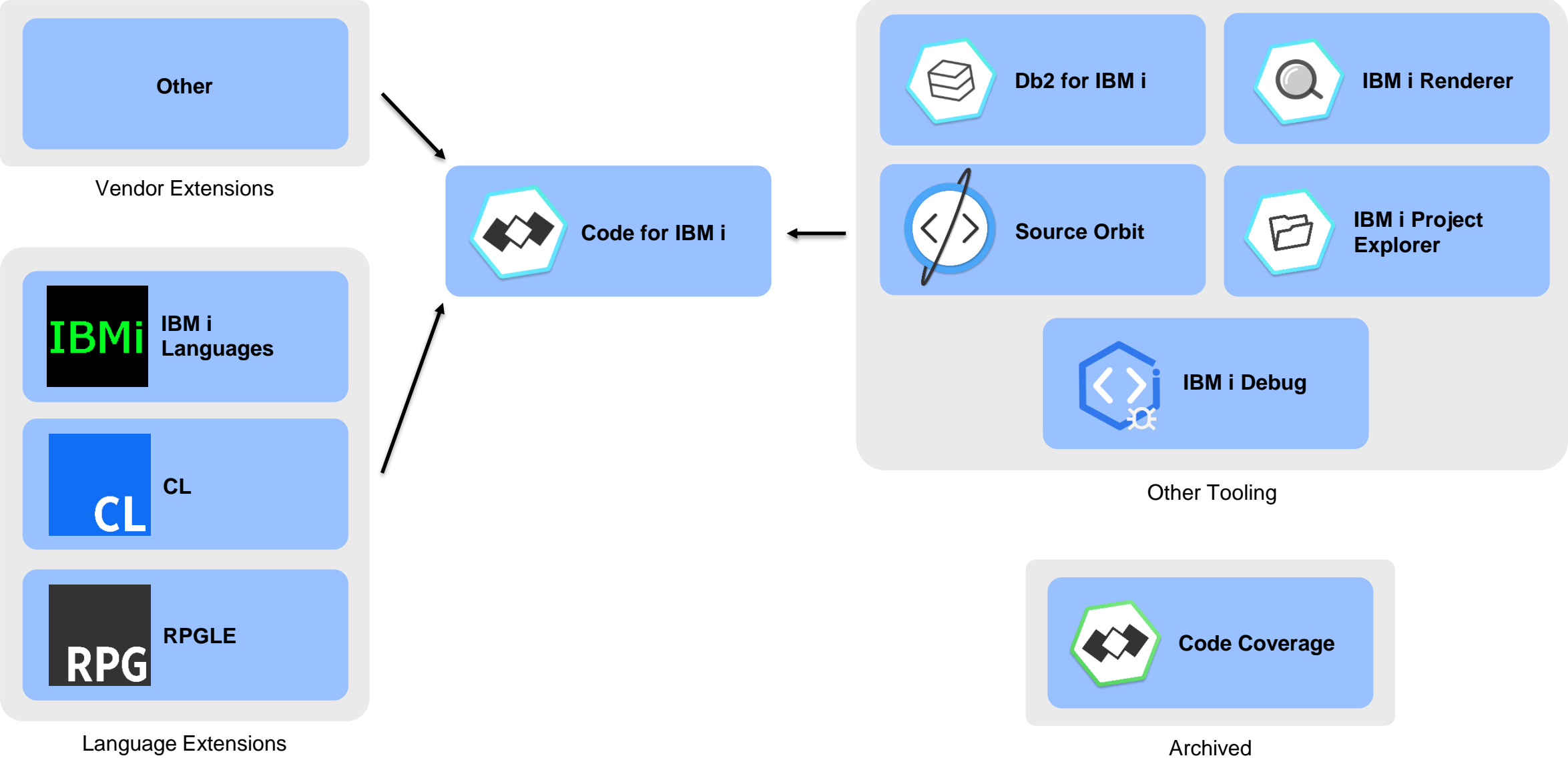


IBM i Unit Testing Now in VS Code!



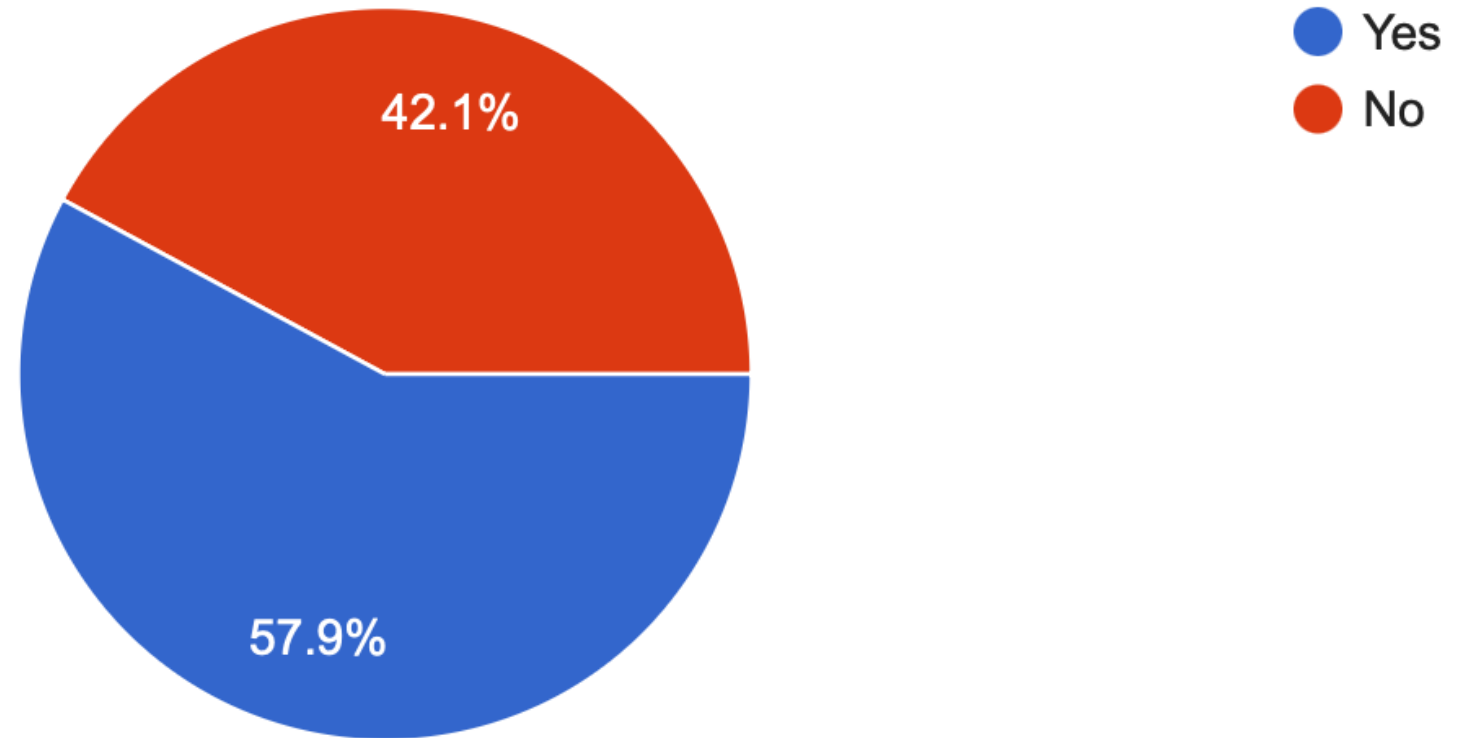
What is missing in the VS Code stack?



We did a survey...

Have you done unit testing with IBM i before?

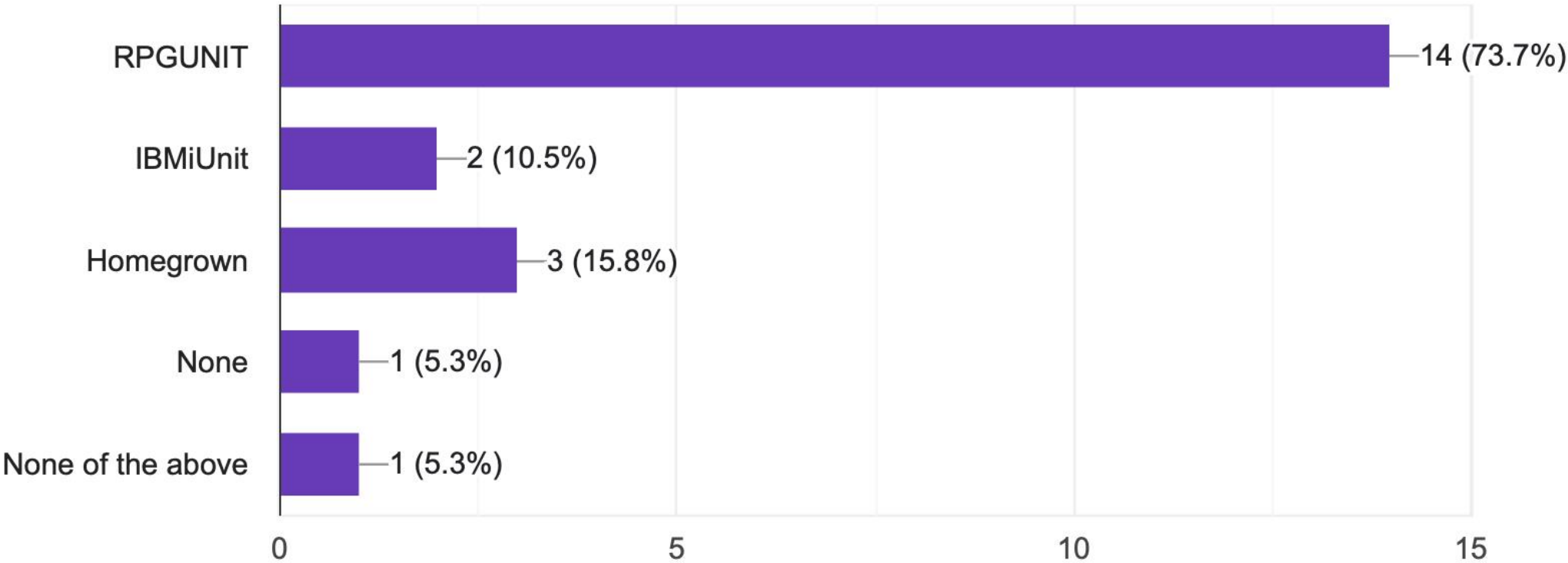
19 responses



We did a survey...

What framework did you use for IBM i testing?

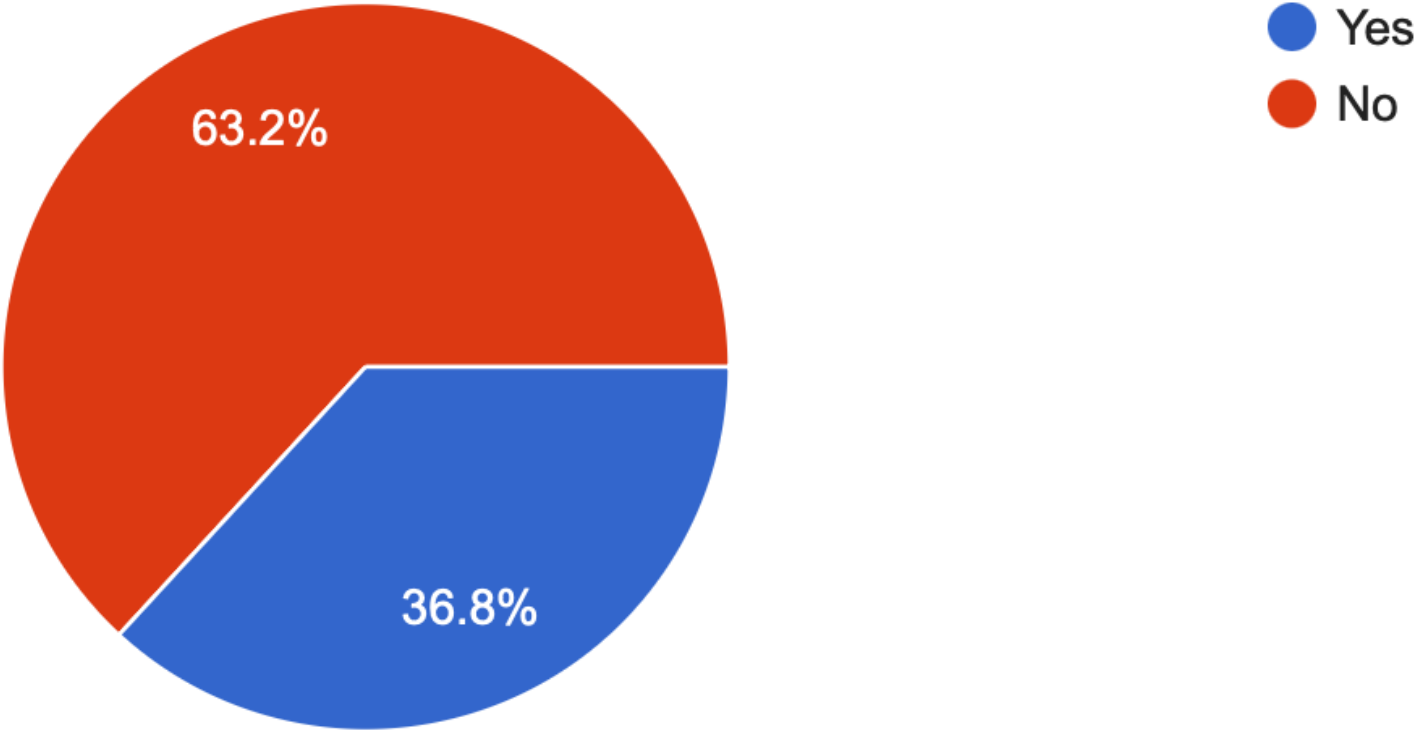
19 responses



We did a survey...

Have you used IBM i Code Coverage? (CODECOV)

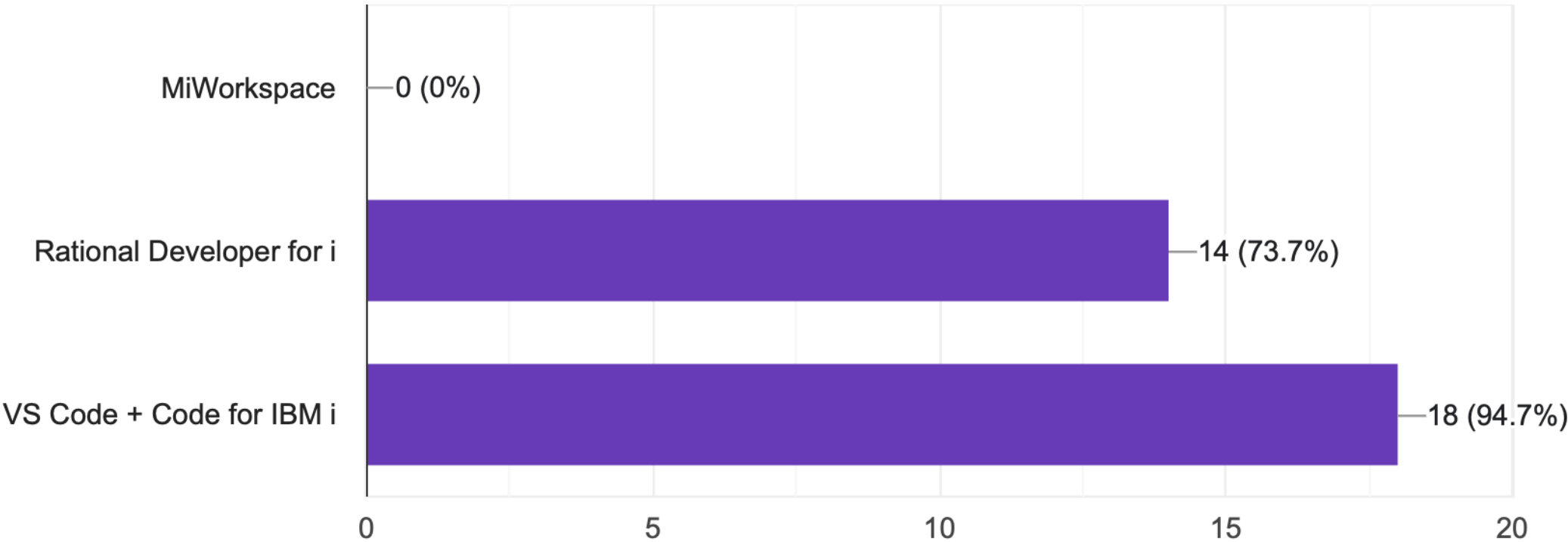
19 responses



We did a survey...

Which IDEs for IBM i have you used?

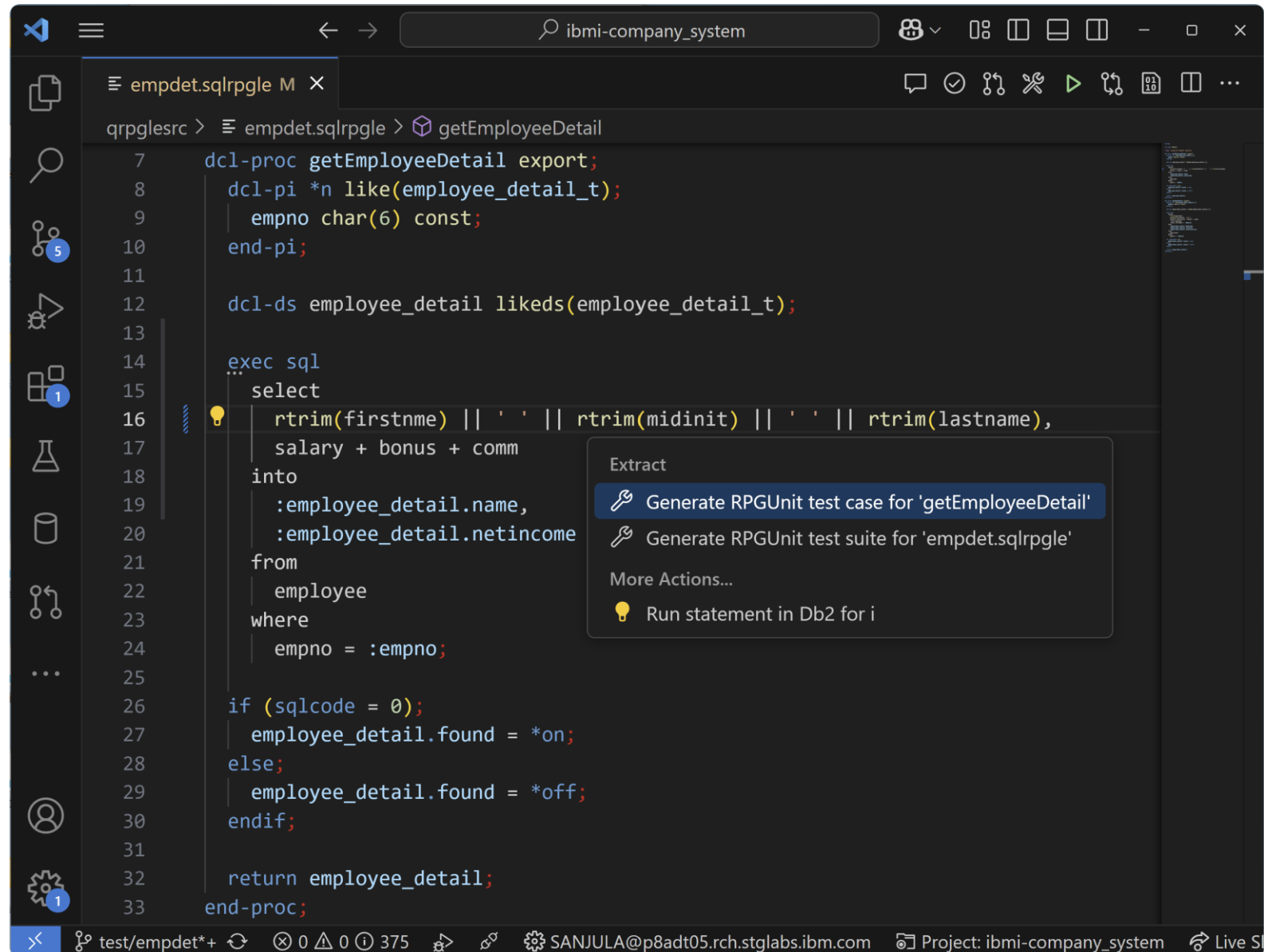
19 responses



Let's look at the new IBM i Testing Extension



Generating test stubs



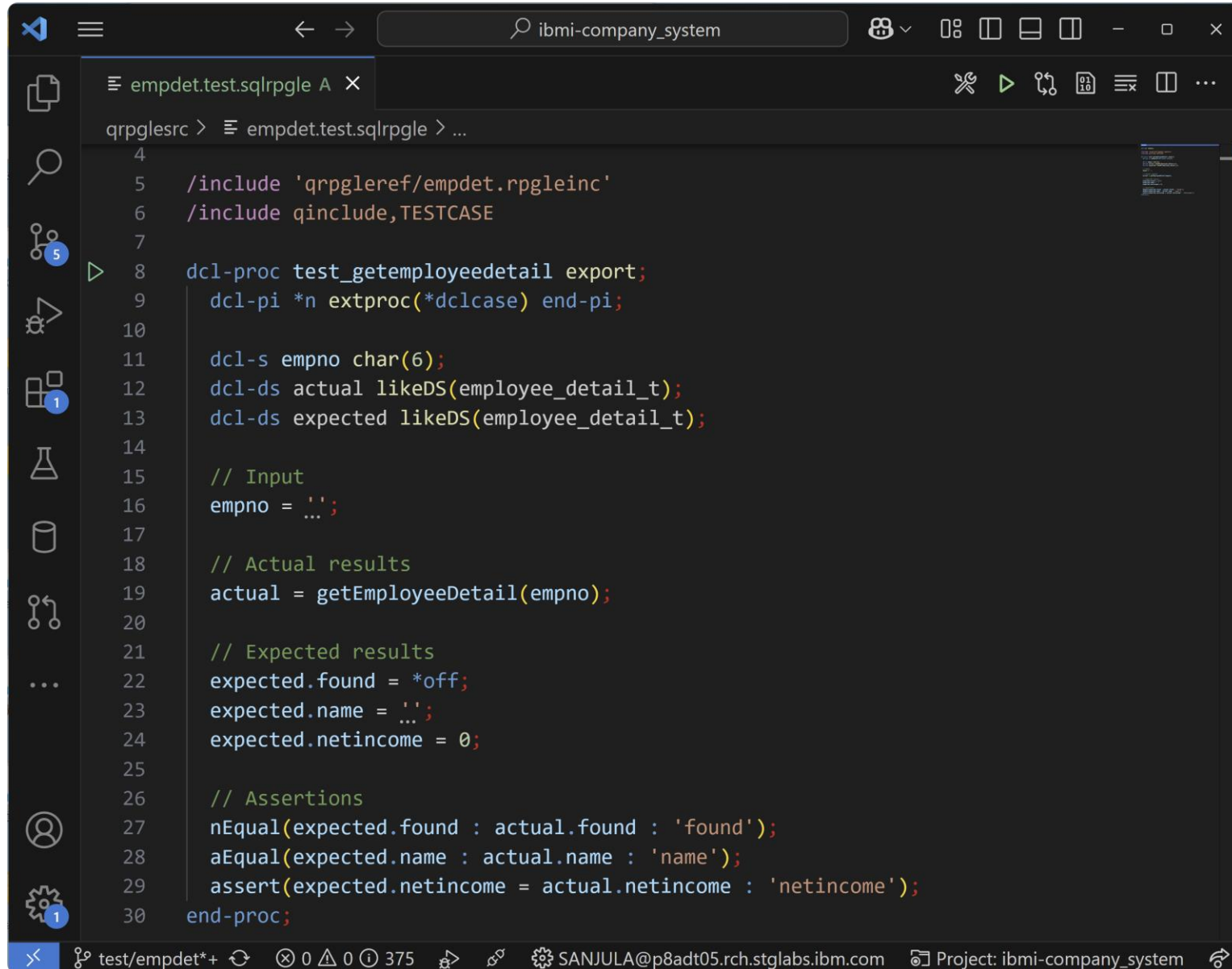
The screenshot shows a code editor window titled 'empdet.sqlrpgle M'. The code is written in RPG/SQL and defines a procedure 'getEmployeeDetail'. A context menu is open over the 'select' statement, offering options to generate test stubs. The menu includes 'Extract', 'Generate RPGUnit test case for 'getEmployeeDetail'', 'Generate RPGUnit test suite for 'empdet.sqlrpgle'', 'More Actions...', and 'Run statement in Db2 for i'.

```
7 dcl-proc getEmployeeDetail export;  
8 dcl-pi *n like(employee_detail_t);  
9   empno char(6) const;  
10 end-pi;  
11  
12 dcl-ds employee_detail likeds(employee_detail_t);  
13  
14 exec sql  
15   select  
16     rtrim(firstname) || ' ' || rtrim(midinit) || ' ' || rtrim(lastname),  
17     salary + bonus + comm  
18   into  
19     :employee_detail.name,  
20     :employee_detail.netincome  
21   from  
22     employee  
23   where  
24     empno = :empno;  
25  
26   if (sqlcode = 0);  
27     employee_detail.found = *on;  
28   else;  
29     employee_detail.found = *off;  
30   endif;  
31  
32   return employee_detail;  
33 end-proc;
```

Extract

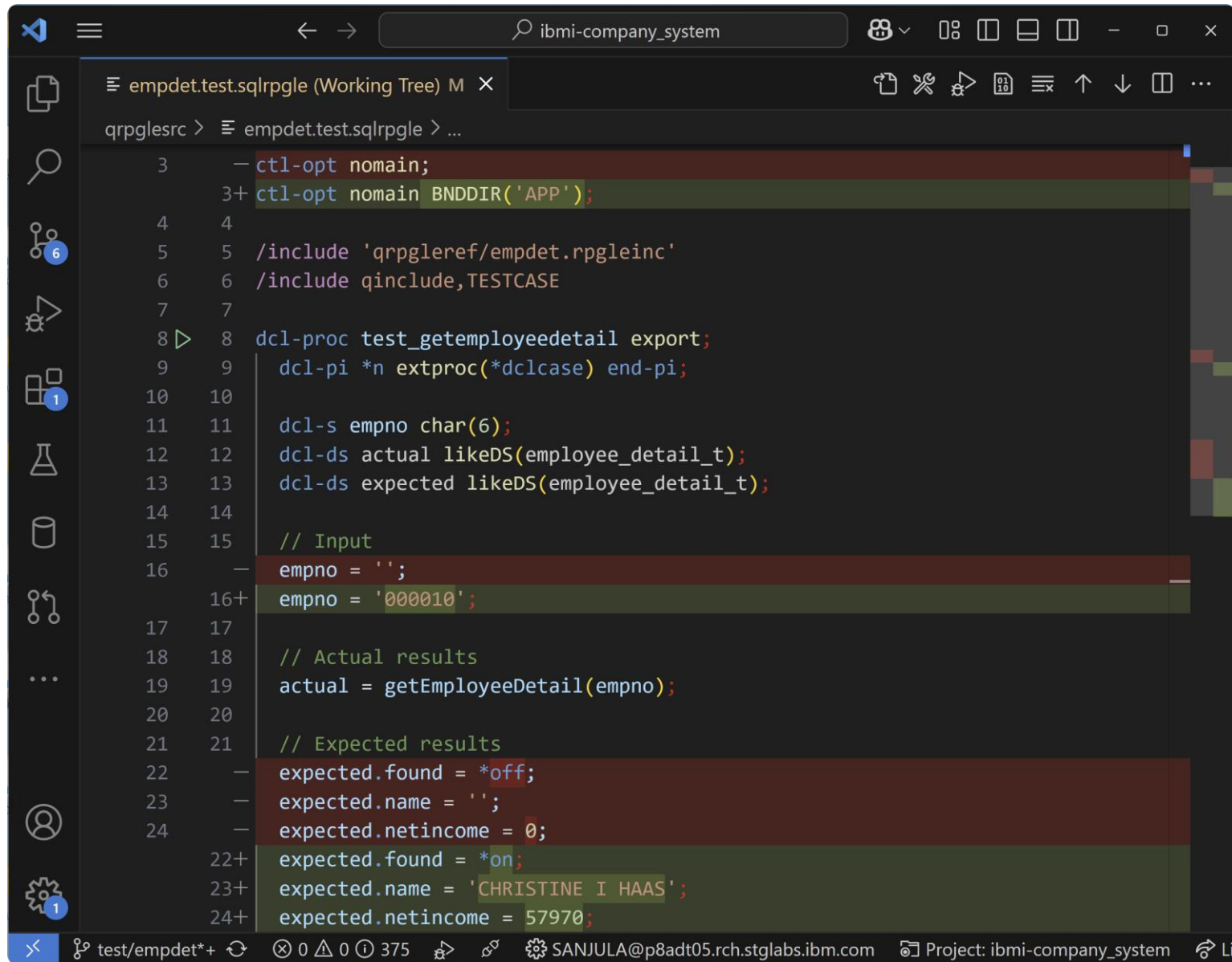
- Generate RPGUnit test case for 'getEmployeeDetail'
- Generate RPGUnit test suite for 'empdet.sqlrpgle'
- More Actions...
- Run statement in Db2 for i

Generating test stubs



```
4  
5  /include 'qrpgleref/empdet.rpgleinc'  
6  /include qinclude,TESTCASE  
7  
8  dcl-proc test_getemployeedetail export;  
9      dcl-pi *n extproc(*dclcase) end-pi;  
10  
11     dcl-s empno char(6);  
12     dcl-ds actual likeDS(employee_detail_t);  
13     dcl-ds expected likeDS(employee_detail_t);  
14  
15     // Input  
16     empno = '..';  
17  
18     // Actual results  
19     actual = getEmployeeDetail(empno);  
20  
21     // Expected results  
22     expected.found = *off;  
23     expected.name = '..';  
24     expected.netincome = 0;  
25  
26     // Assertions  
27     nEqual(expected.found : actual.found : 'found');  
28     aEqual(expected.name : actual.name : 'name');  
29     assert(expected.netincome = actual.netincome : 'netincome');  
30 end-proc;
```

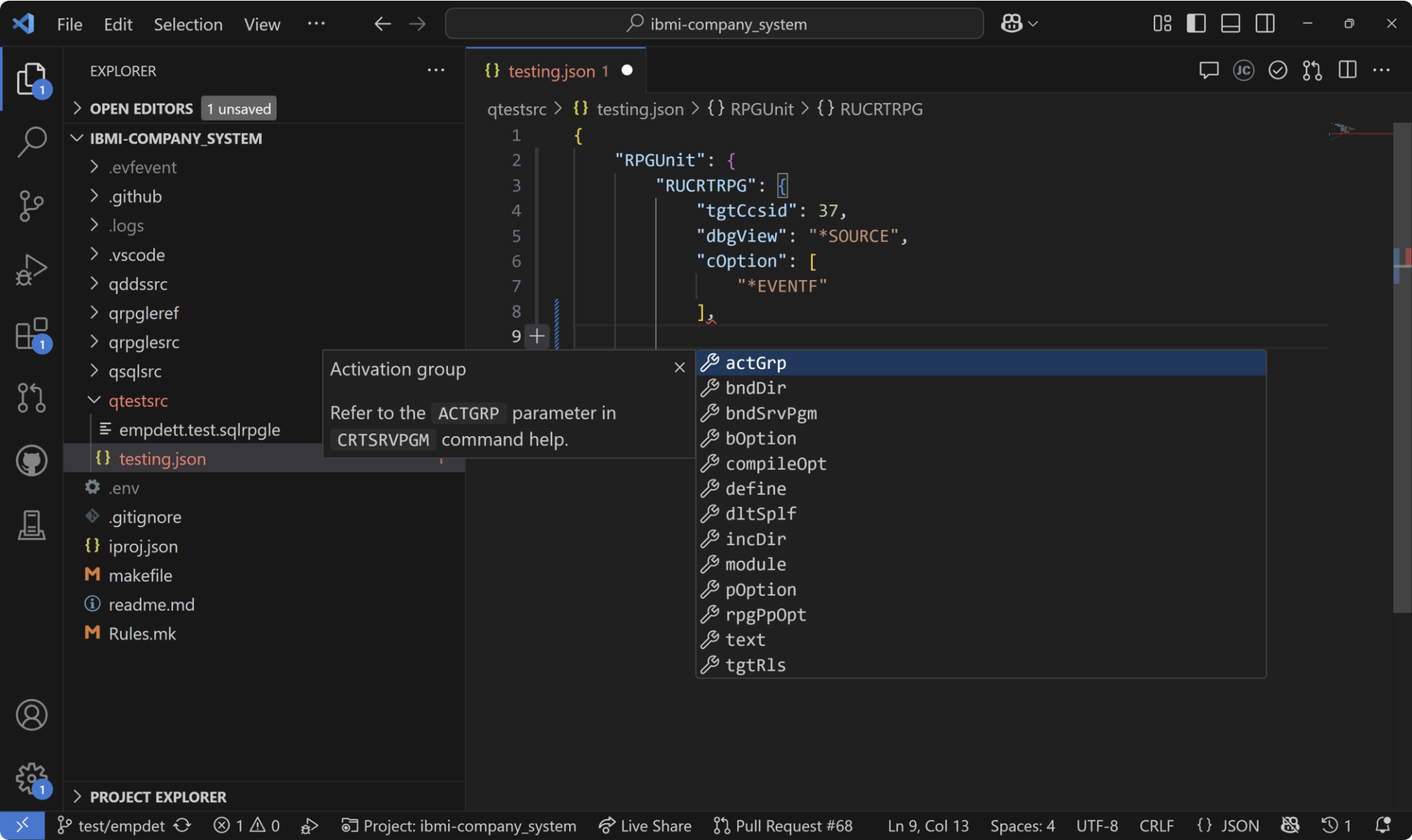
Writing Tests



The screenshot shows a Visual Studio Code editor window with a file named `empdet.test.sqlrpgle` open in the 'Working Tree'. The editor is displaying COBOL code for a test program. The code includes comments and various COBOL statements such as `ctl-opt`, `/include`, `dcl-proc`, `dcl-pi`, `dcl-s`, `dcl-ds`, and `actual = getEmployeeDetail(empno);`. The code is color-coded, and the editor interface includes a sidebar with icons for Explorer, Search, Run and Debug, and Extensions. The status bar at the bottom shows the project name 'ibmi-company_system' and the user 'SANJULA@p8adt05.rch.stglabs.ibm.com'.

```
3      - ctl-opt nomain;  
3+    3+ ctl-opt nomain BNDDIR('APP');  
4      4  
5      5 /include 'qrpgleref/empdet.rpgleinc'  
6      6 /include qinclude,TESTCASE  
7      7  
8      8 dcl-proc test_getemployeedetail export;  
9      9   dcl-pi *n extproc(*dclcase) end-pi;  
10     10  
11     11   dcl-s empno char(6);  
12     12   dcl-ds actual likeDS(employee_detail_t);  
13     13   dcl-ds expected likeDS(employee_detail_t);  
14     14  
15     15   // Input  
16     - empno = '';  
16+    16+ empno = '000010';  
17     17  
18     18   // Actual results  
19     19   actual = getEmployeeDetail(empno);  
20     20  
21     21   // Expected results  
22     - expected.found = *off;  
23     - expected.name = '';  
24     - expected.netincome = 0;  
22+    22+ expected.found = *on;  
23+    23+ expected.name = 'CHRISTINE I HAAS';  
24+    24+ expected.netincome = 57970;
```

Configuring tests



Running unit tests



TEST EXPLORER

Filter (e.g. text, !exclude, @tag)

1/1 9.3s

ibmi-company_system 68ms

qrpglesrc 68ms

empdet.test.sqlrpgle 68ms

test_getemployeedetail 68ms

RPGUNIT

empdet.test.sqlrpgle M X

qrpglesrc > empdet.test.sqlrpgle > test_getemployeedetail

8 dcl-proc test_getemployeedetail export;

9 dcl-pi *n extproc(*dclcase) end-pi;

10

11 dcl-s empno char(6);

12 dcl-ds actual likeDS(employee_detail_t);

13 dcl-ds expected likeDS(employee_detail_t);

14

15 // Input

16 empno = '000010';

PROBLEMS 375 COMMENTS DB2 FOR I DEBUG CONSOLE OUTPUT TERMINAL TEST RESULTS

WORKSPACE

ibmi-company_system (1) [Deployment Successful]

> empdet.test.sqlrpgle (1) [Compilation Successful]

✓ test_getemployeedetail 0.068s

EXECUTION

Deployments: 1 successful | 0 failed (1)

Compilations: 1 successful | 0 failed | 0 skipped (1)

RESULTS

Test Files: 1 passed | 0 failed | 0 errored (1)

Test Cases: 1 passed | 0 failed | 0 errored (1)

Assertions: 3

Duration: 0.068s

PASS

IBM i Testing

✓ test_getemployeede...

< test/empdet*+ 0 0 375 SANJULA@p8adt05.rch.stglabs.ibm.com Project: ibmi-company_system Live Share Deploy New job (1) Pul

Running tests

TEST EXPLORER

Filter (e.g. text, !exclude, @tag)

6/16

17.3s

examples 35ms

- cbl.test.cbllc
 - TEST_TRUE
 - TEST_FALSE
 - TEST_FAIL0
 - TEST_FAIL1
- rpgsqlstmf.test.sqlrpgle 26ms
 - testWhatever_1 25ms
 - testWhatever_2 1.0ms
- rpgstmf.test.rpgle 3.0ms
 - testWhatever_1 3.0ms
 - testWhatever_2 0.0ms
- sub 6.0ms
- RPGUNIT

rpgstmf.test.rpgle

```
222 // =====
223 // RPGUnit test case.
224 // =====
225 dcl-proc testWhatever_1 export;
226   dcl-pi *n extproc(*dclcase) end-pi;
227
228   print('Executing:      * testWhatever_1()');
229
230   // Run
231   assert(sds.pgmName = 'TEMPLATE': 'Name of the test suite should be 'TEMPLATE''');
232
233   // Place your assertions here.
234
235 end-proc;
```

PROBLEMS

DB2 FOR I

DEBUG CONSOLE

OUTPUT

TERMINAL

PORTS

IBM I JOB LOG

TEST RESULTS

WORKSPACE

examples (4) [Deployment Successful]

> rpgstmf.test.rpgle (2) [Compilation Skipped]

X testWhatever_1 0.003s

Failure (line 231): Name of the test suite should be 'TEMPLATE'

✓ testWhatever_2 0s

> rpgsqlstmf.test.sqlrpgle (2) [Compilation Skipped]

✓ testWhatever_1 0.025s

✓ testWhatever_2 0.001s

> cbl.test.cbllc (4) [Compilation Failed]

CPFA0A9: Object not found. Object is EN_US.UTF-8.

: CRTCBMOD MODULE(*PGMID) SRCSTMF('/home/SANJULA/builds/examples/cbl.test.cbllc') OPTION(*EVENTF) DBGVIEW(*SOURCE) TGTRLS(*CURRENT) INCDIR('/home/SANJULA/builds/examples') DEFINE(*NONE) TGTCCSID(37)

CPFA0A9: Object not found. Object is EN_US.UTF-8.

CPFA0A9: Object not found. Object is EN_US.UTF-8.

CPFA0A9: Object not found. Object is EN_US.UTF-8.

CPD4090: Printer device PRT01 not found. Output queue changed to QPRINT i

n library QGPL.

CPFA0A9: Object not found. Object is EN_US.UTF-8.

IBM i Testing

- TEST_TRUE cbl.test.cbllc < examples
- TEST_FALSE cbl.test.cbllc < examples
- TEST_FAIL0 cbl.test.cbllc < examples
- TEST_FAIL1 cbl.test.cbllc < examples
- TEST_TRUE cbl.test.cbllc < sub < examples
- TEST_FALSE cbl.test.cbllc < sub < examples
- TEST_FAIL0 cbl.test.cbllc < sub < examples
- TEST_FAIL1 cbl.test.cbllc < sub < examples
- testWhatever_1 Name of the test suite should b...
- testWhatever_1 Name of the test suite should b...
- testWhatever_2 rpgstmf.test.rpgle < examples
- testWhatever_1 rpgsqlstmf.test.sqlrpgle < examp...
- testWhatever_2 rpgsqlstmf.test.sqlrpgle < examp...
- testWhatever_2 rpgstmf.test.rpgle < sub < examp...

main*

0 0

SANJULA@p8adt05.rch.stglabs.ibm.com

Live Share

Deploy

New job (1)

Ln 239, Col 45

Spaces: 2

UTF-8

CRLF

{ } RPGLE

1

Generating code coverage

TESTING

TEST EXPLORER

Filter (e.g. text, !exclude, @tag)

1/2 6.0s

examples 195ms

- cbl.test.cbllc
- ✓ rpgsqlstmf.test.sqlrpgle 93ms
- ✗ rpgstmf.test.rpgle 4.0ms

sub 98ms

- cbl.test.cbllc
- ✓ rpgsqlstmf.test.sqlrpgle 94ms
- ✗ rpgstmf.test.rpgle 4.0ms
 - ✗ testWhatever_1 3.0ms
 - ✓ testWhatever_2 1.0ms

Run Test with Coverage

TEST COVERAGE

rpgstmf.test.rpgle 60.00%

rpgstmf.test.rpgle

Hide Inline Coverage Rerun

```
165 // =====
166 // Set up test suite. Executed once per RUCALLTST.
167 // =====
168 dcl-proc setUpSuite export;
169   dcl-pi *n extproc(*dclcase) end-pi;
170
171   dcl-s rc char(1);
172
173   runCmd('OVRPRTF FILE(QSYSPRT) TOFILE(*FILE) +
174         SPLFNAME(PROC_FLOW) OVRSCOPE(*JOB)');
175   monitor;
176     openPrinter();
177     print('Executing:  setUpSuite()');
178   on-error;
179     // ignore errors ...
180   endmon;
181
182   // ... but try to remove the override.
183   monitor;
184     runCmd('DLTOVR FILE(QSYSPRT) LVL(*JOB)');
185   on-error;
186     dsply '*** Failed to delete QSYSPRT override! ***' rc;
187   endmon;
188 end-proc;
189
190
191 // =====
192 // Tear down test suite.
193 // =====
194 dcl-proc tearDownSuite export;
```

PROBLEMS

COMMENTS

DB2 FOR I

DEBUG CONSOLE

OUTPUT

TERMINAL

PORTS

IBM I JOB LOG

TEST RESULTS

> rpgstmf.test.rpgle (2) [Compilation Skipped]
✗ testWhatever_1 0.003s
Failure: Name of the test suite should be 'TEMPLATE'
✓ testWhatever_2 0.001s

Test Cases: 1 passed | 1 failed | 0 errored (2)
Duration: 0.004s

IBM i Testing

✗ Close Test Coverage

✗ testWhatever_1 Name of the test suite should be 'TEMPLATE'

✓ testWhatever_2

> 7 older results

Important Links

IBM i Testing

VS Code Marketplace

<https://marketplace.visualstudio.com/items?itemName=IBM.vscode-ibmi-testing>

Documentation

<https://codefori.github.io/docs/developing/testing/overview/>

GitHub Repository

<https://github.com/IBM/vscode-ibmi-testing>

RPGUNIT

Documentation

<https://irpgunit.sourceforge.io/help/>

GitHub Repository

<https://github.com/tools-400/irpgunit>

VS Code

Documentation

<https://code.visualstudio.com/docs/editor/testing>

Sanjula Ganepola - IBM i Unit Testing Now in VS Code!

Please take the last minute of this session to complete the evaluation. A direct link to the evaluation can be found using the QR code to the right.



IBM i