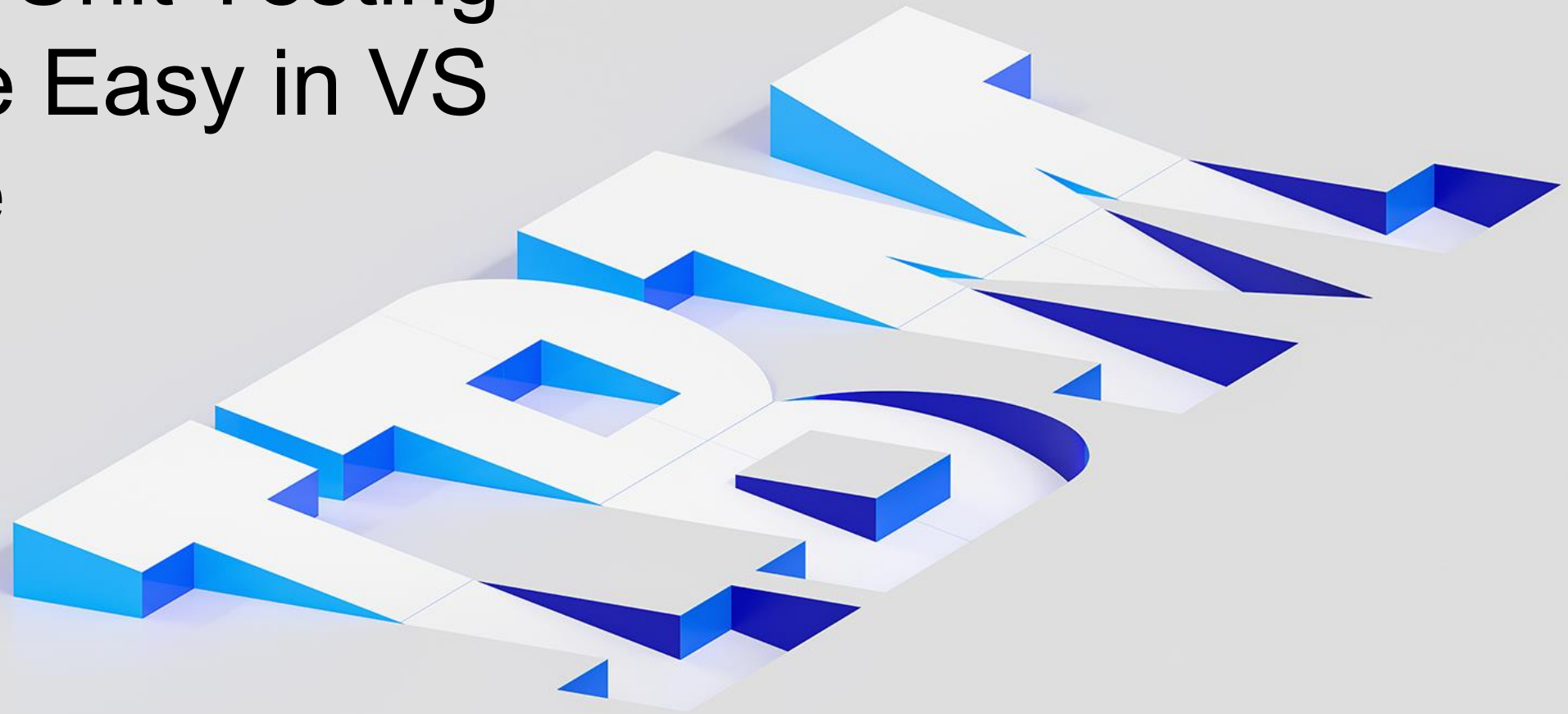
RPG Unit Testing Made Easy in VS Code



Sanjula Ganepola
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Sanjula.Ganepola@ibm.com
2025 February

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Agenda

- Why Build Tooling for Unit Testing?
- Basics of RPGUnit
- IBM i Testing Extension Demo
  - How to write tests and generate test stubs?
  - How to run tests with code coverage?
- IBM i Testing CLI Demo
  - How to run tests outside VS Code?
  - How to run tests in a CI/CD pipeline?

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Why Build Tooling for Unit Testing?

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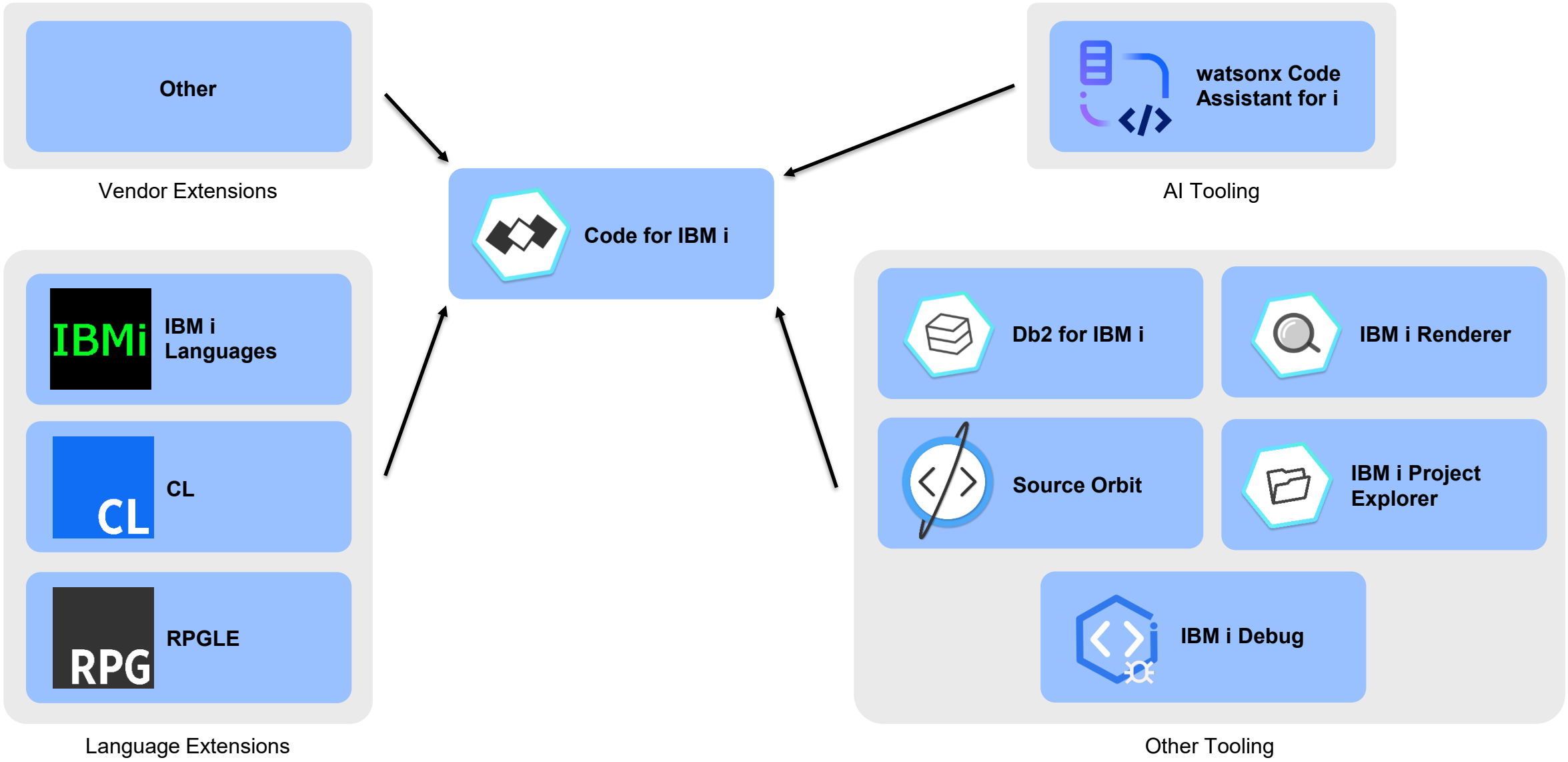
What is missing in the VS Code stack?



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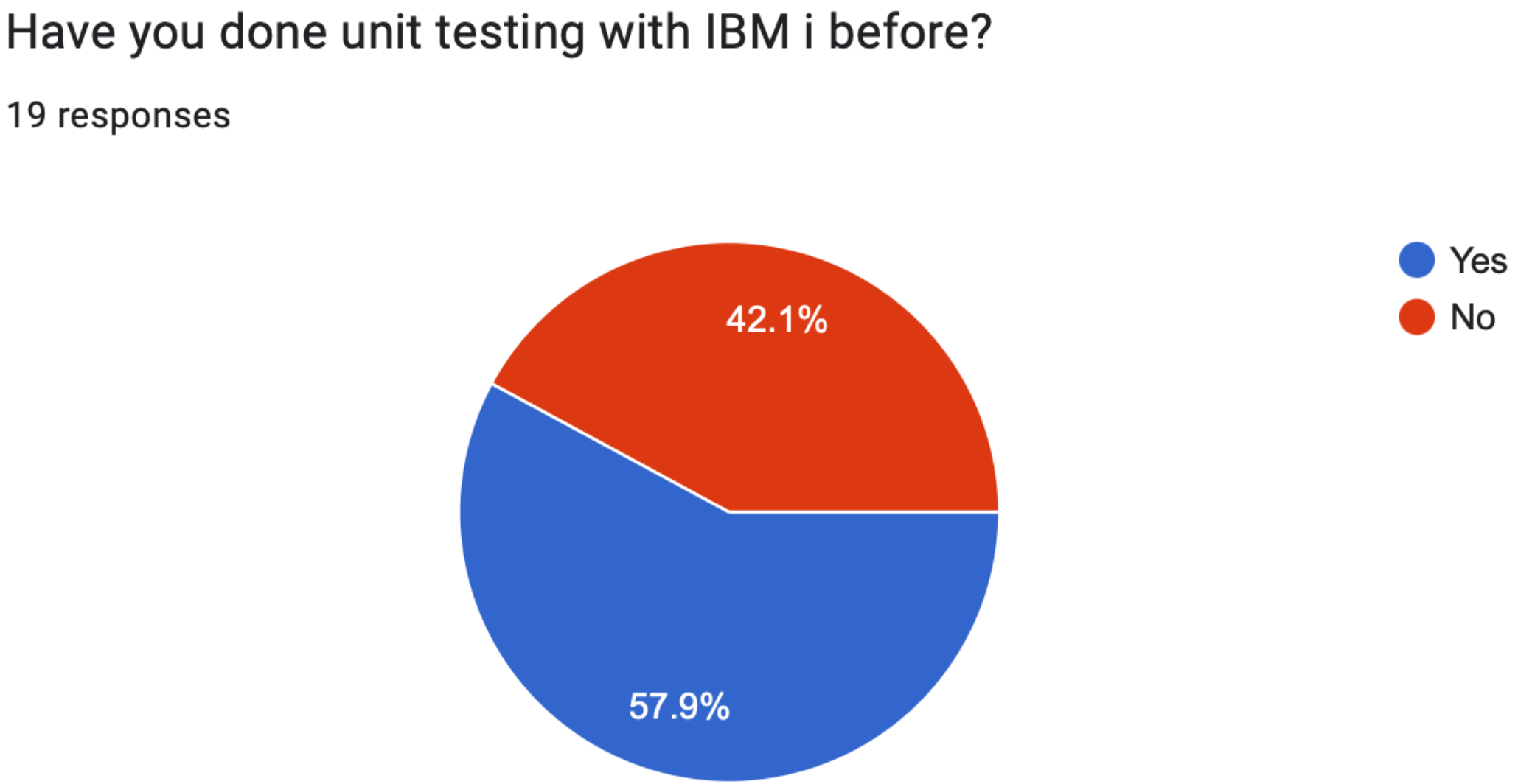
We did a survey...



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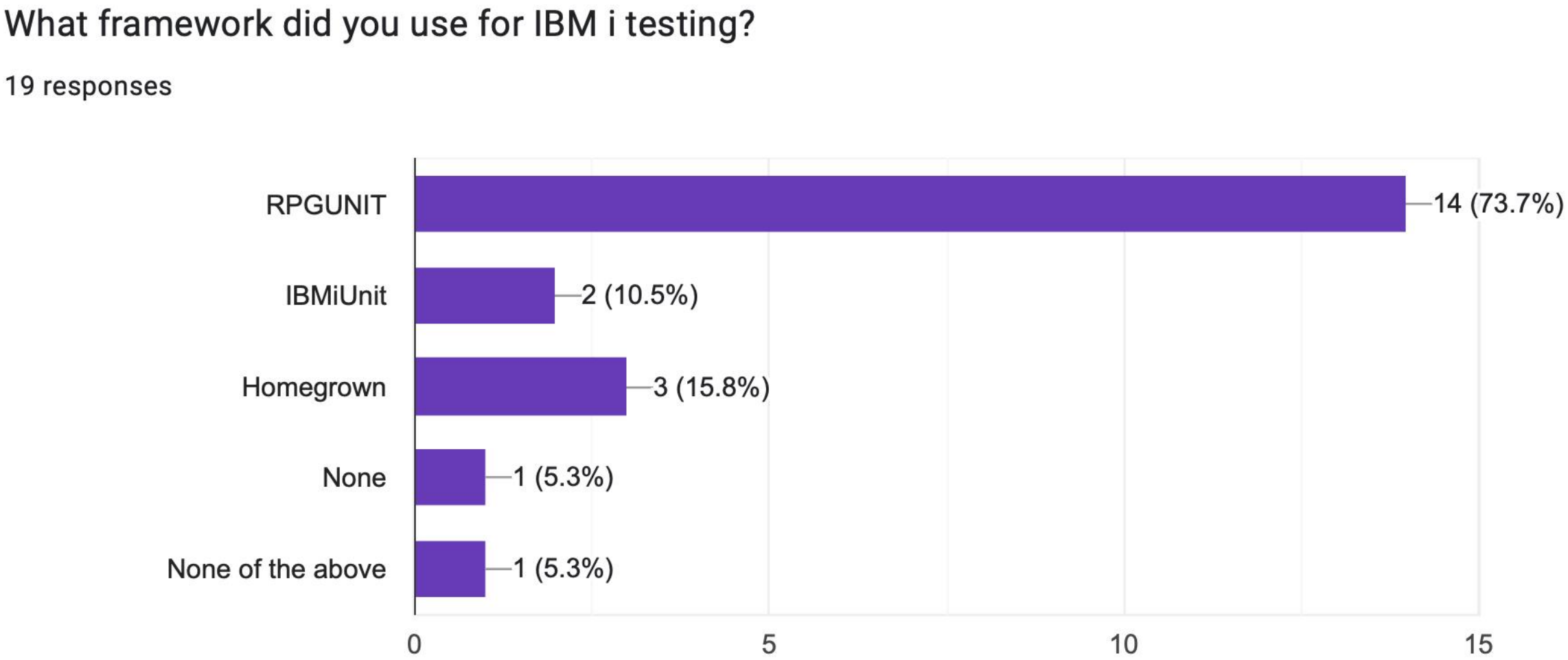

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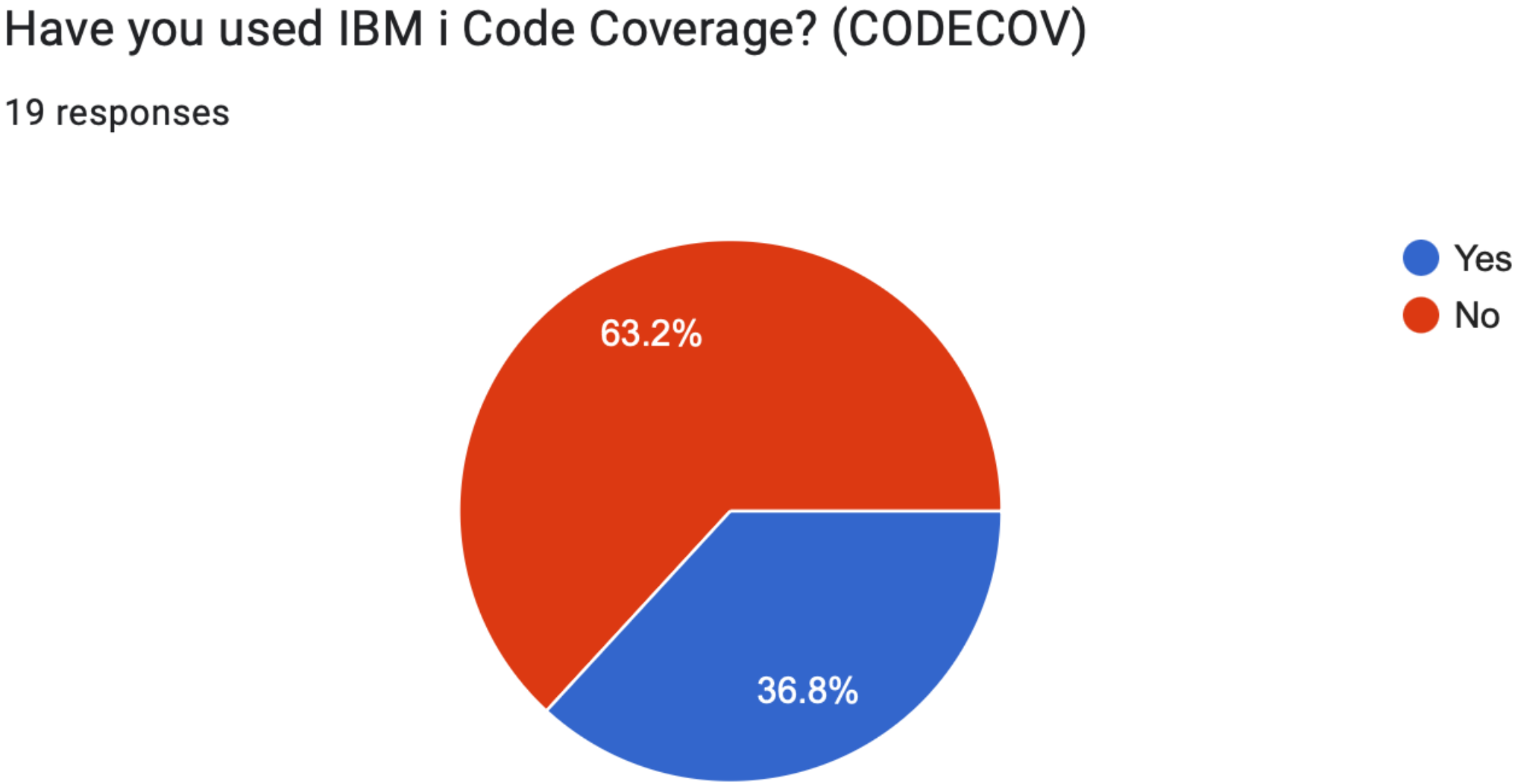
We did a survey...



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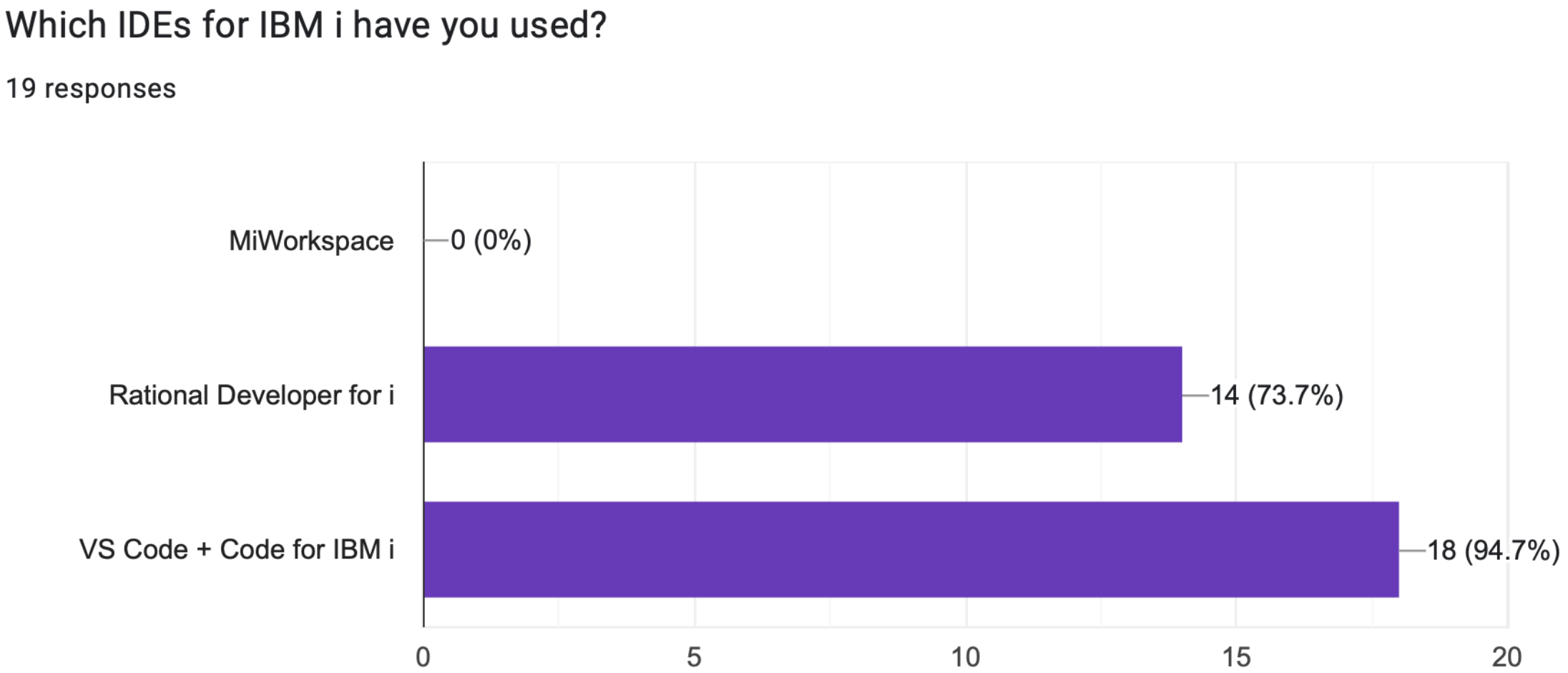
We did a survey...



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Do not edit
How to change the design

Have you done unit testing with IBM i before?

ⓘ The Slido app must be installed on every computer you're presenting from

slido

Do not edit
How to change the design

What framework did you use for IBM i testing?

ⓘ The Slido app must be installed on every computer you're presenting from

slido

Do not edit
How to change the design

Have you used CODECOV?

ⓘ The Slido app must be installed on every computer you're presenting from

slido

Basics of RPGUnit

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Naming requirements

A test case ...
- is an exported procedure
- starts with the name test
  - test_getEmployeeDetail
  - test_getDeptDetail
  - testIsPalindrome
  - testFactorial

A test suite ...
- has no naming requirements

but the extension requires that ...
- local files are suffixed with .test.rpgle, .test.sqlrpgle, .test.cblle, or .test.sqlcblle

and recommends that ...
- source members are prefixed or suffixed with T, _T, T_, etc.

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Assertions & utilities

💡 Add the copybook: /include qinclude,TESTCASE

Example Assertions:

```
// ✅ Pass
assert( 1=1 : 'Impossible to fail' );

// ❌ Fail
assert( 1=0 : 'Obviously wrong' );
```

Example Utilities:

```
monitor;
  a = 10;
  b = 0;
  c = a / b;

  // ❌ Fail: Only runs if exception was not caught
  fail('Division by zero did not raise an error.');
on-error;
  msgInfo = getMonitoredMessage(*ON);
endmon;

// ✅ Pass
aEqual( 'MCH1211' : msgInfo.Id );
```


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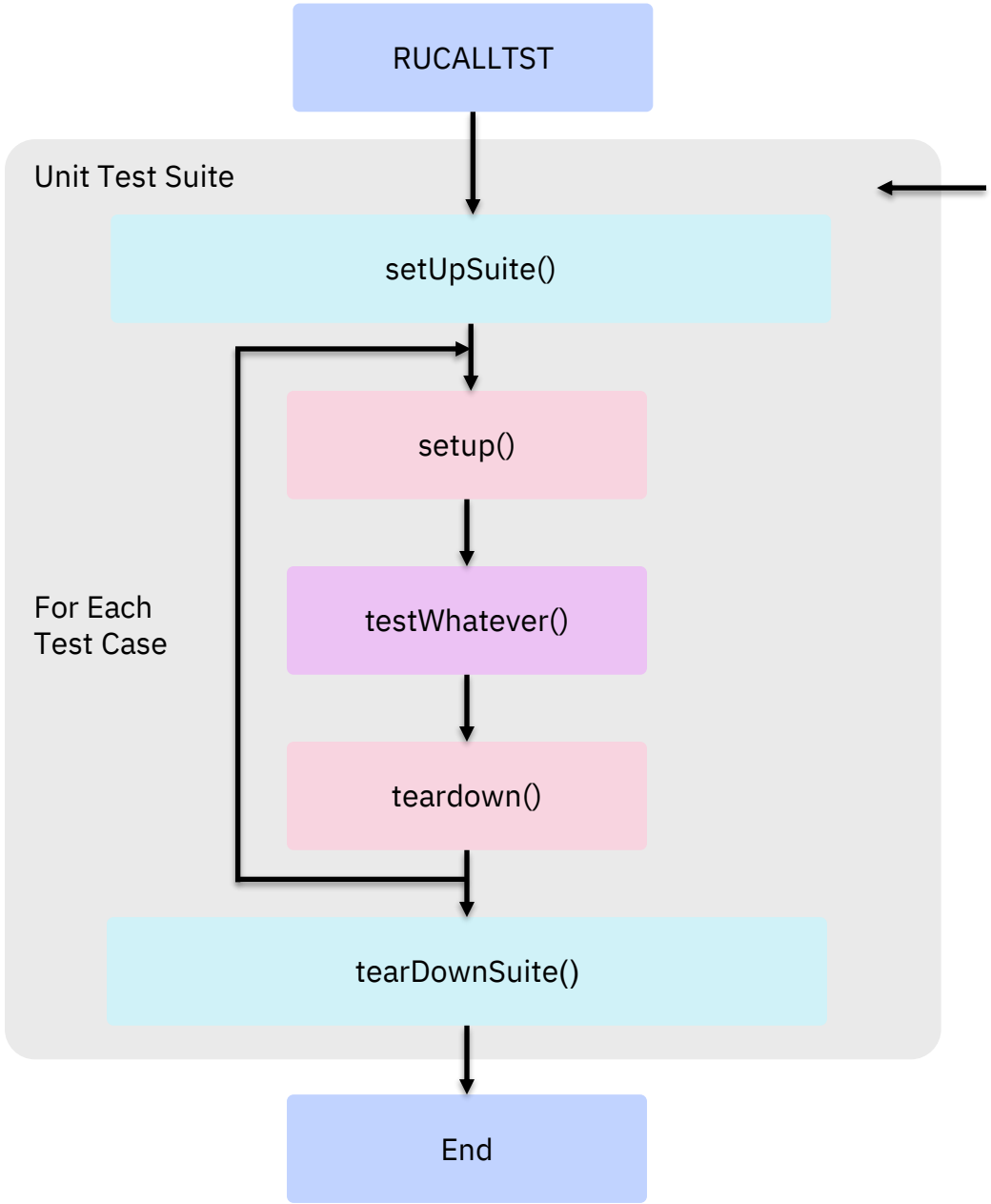
Set up and tear down



💡 Add the copybook:
/include qinclude,TESTCASE

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Compile and execution commands

Compile Command:

```
RPGUNIT/RUCRTRPG TSTPGM(MYUSER/TEMPDET) SRCSTMF('/home/MYUSER/builds/
ibmi-company_system/qtestsrc/empdet.test.sqlrpgle') TGTCCSID(*JOB)
DBGVIEW(*SOURCE) COPTION(*EVENTF) RPGPPOPT(*LVL2) INCDIR('''/home/
MYUSER/builds/ibmi-company_system''')
```

Execution Command:

```
RPGUNIT/RUCALLTST TSTPGM(MYUSER/TEMPDET) ORDER(*REVERSE) DETAIL(*ALL)
OUTPUT(*ALLWAYS) LIBL(*CURRENT) JOBD(*DFT) RCLRSC(*NO) XMLSTMF('/tmp/
testing/vscode-ibmi-testing/RPGUNIT/TEMPDET_1751646914682.xml')
```


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IBM i Testing Extension Demo

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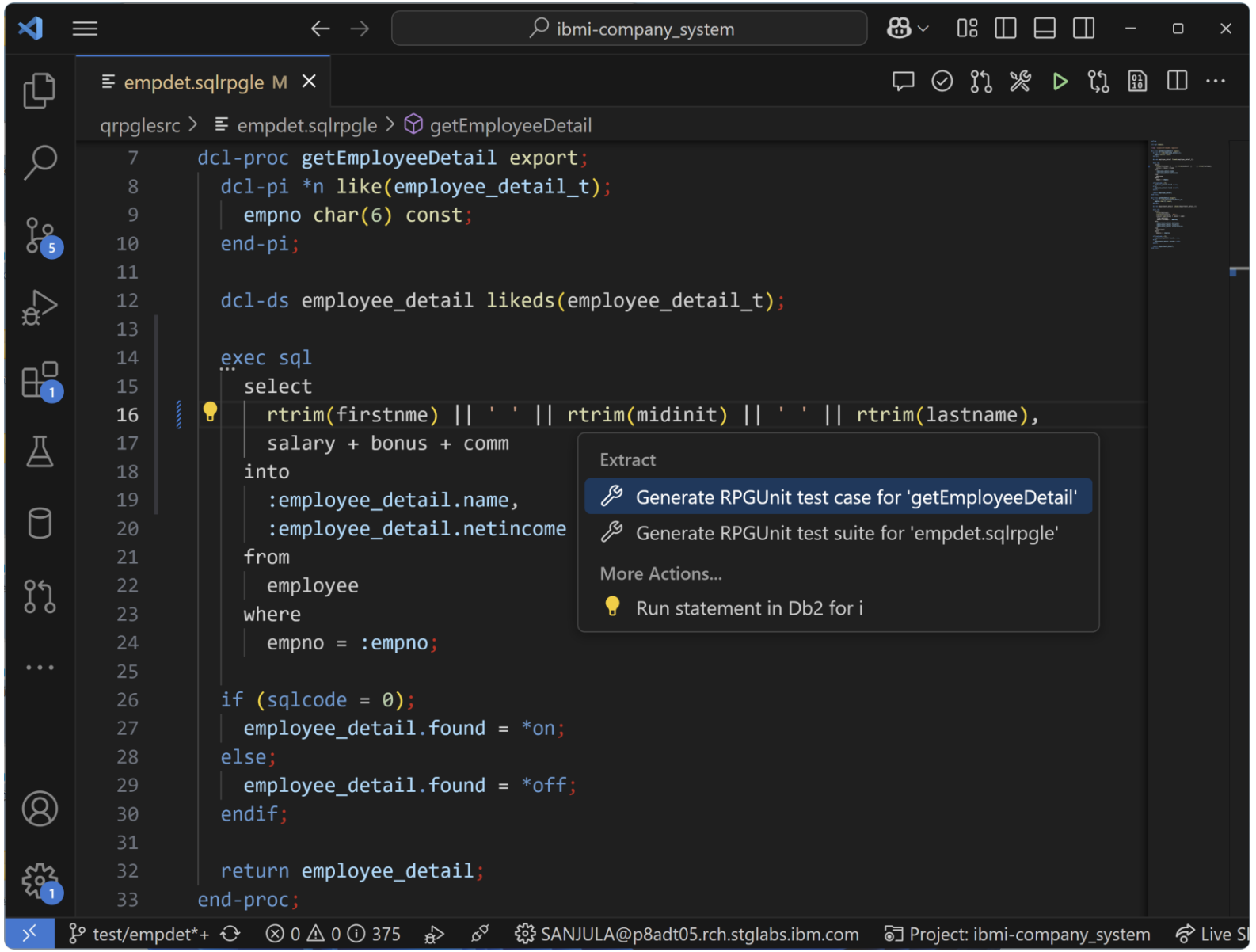
Generating test stubs



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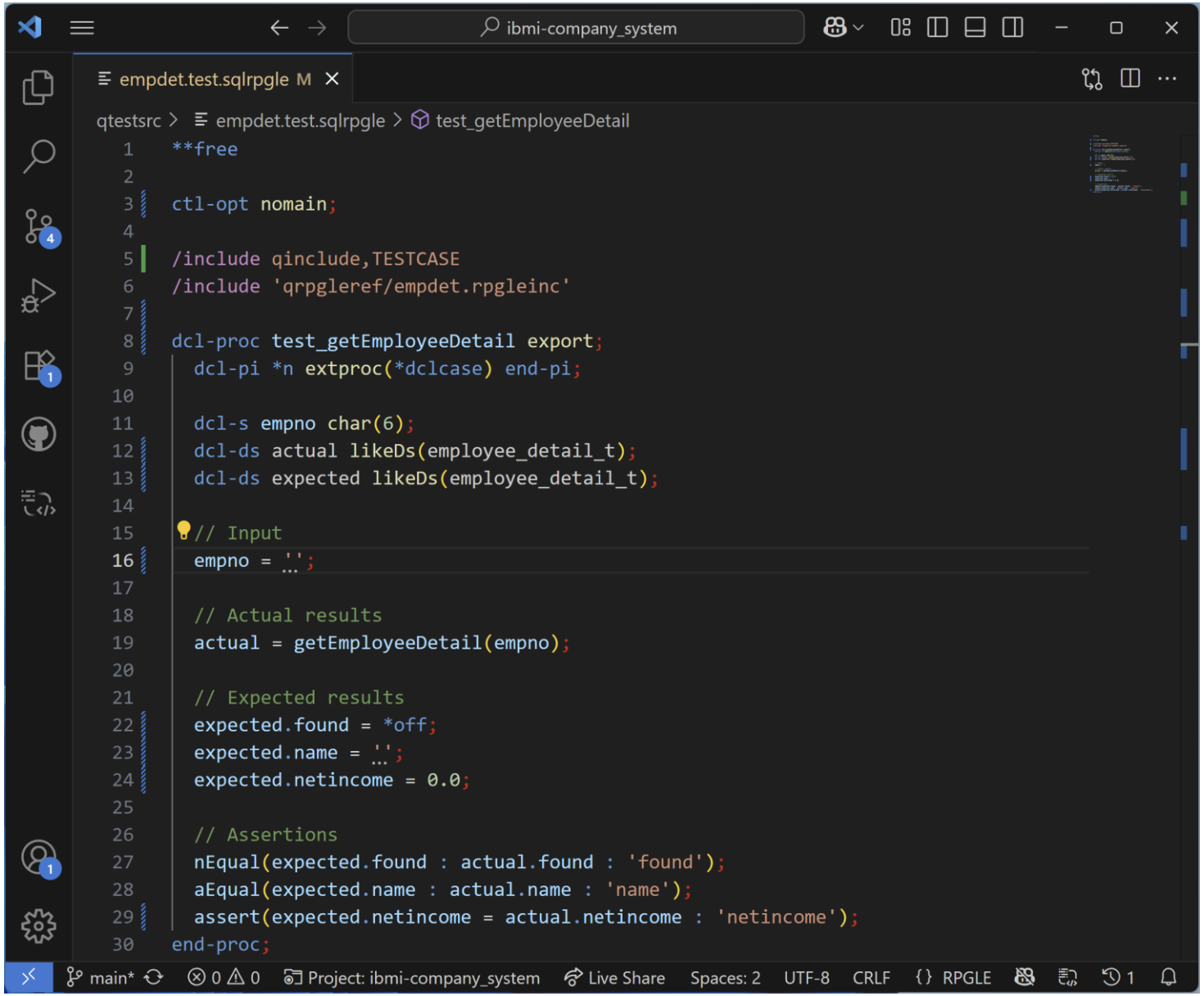
Generating test stubs



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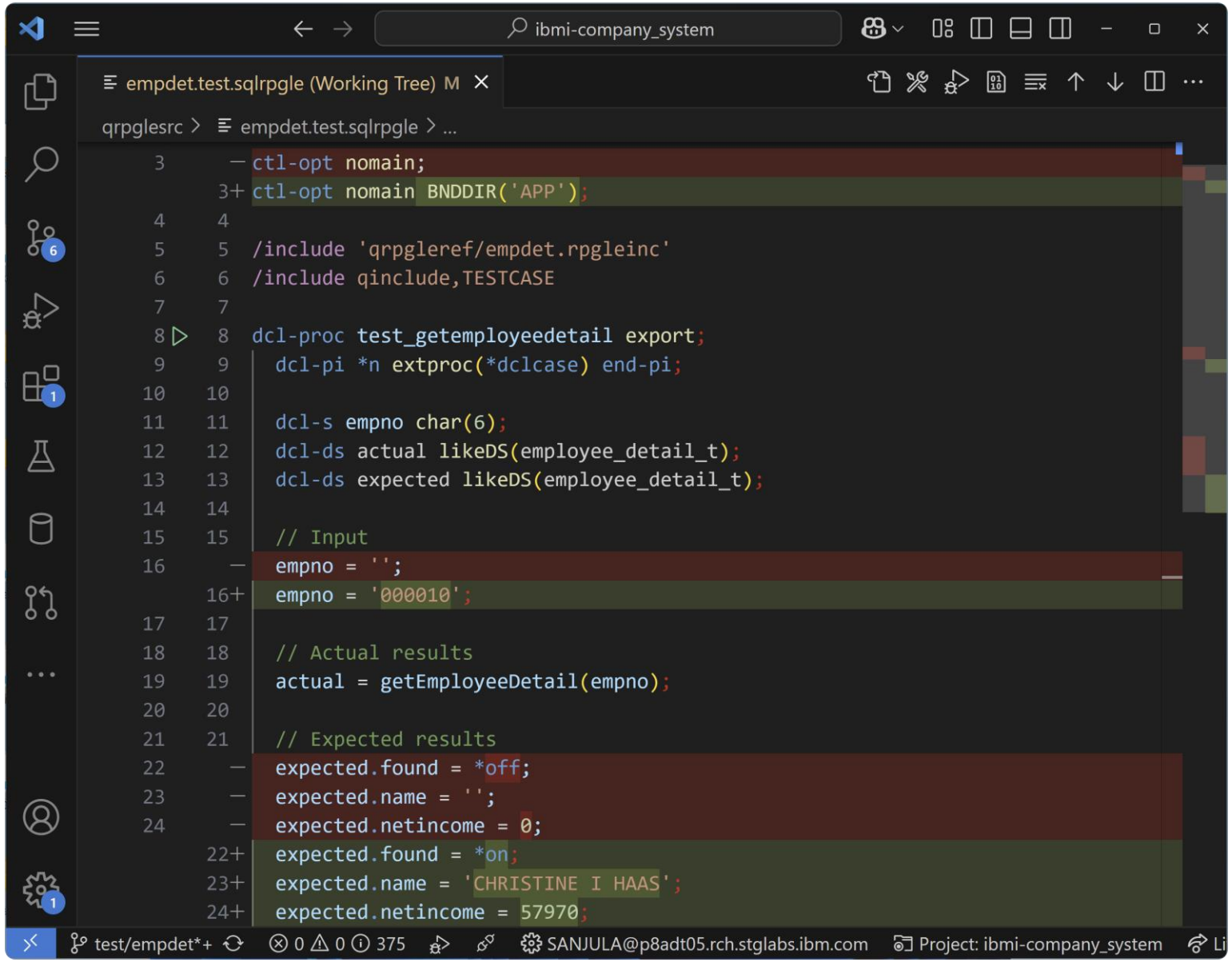
Writing tests



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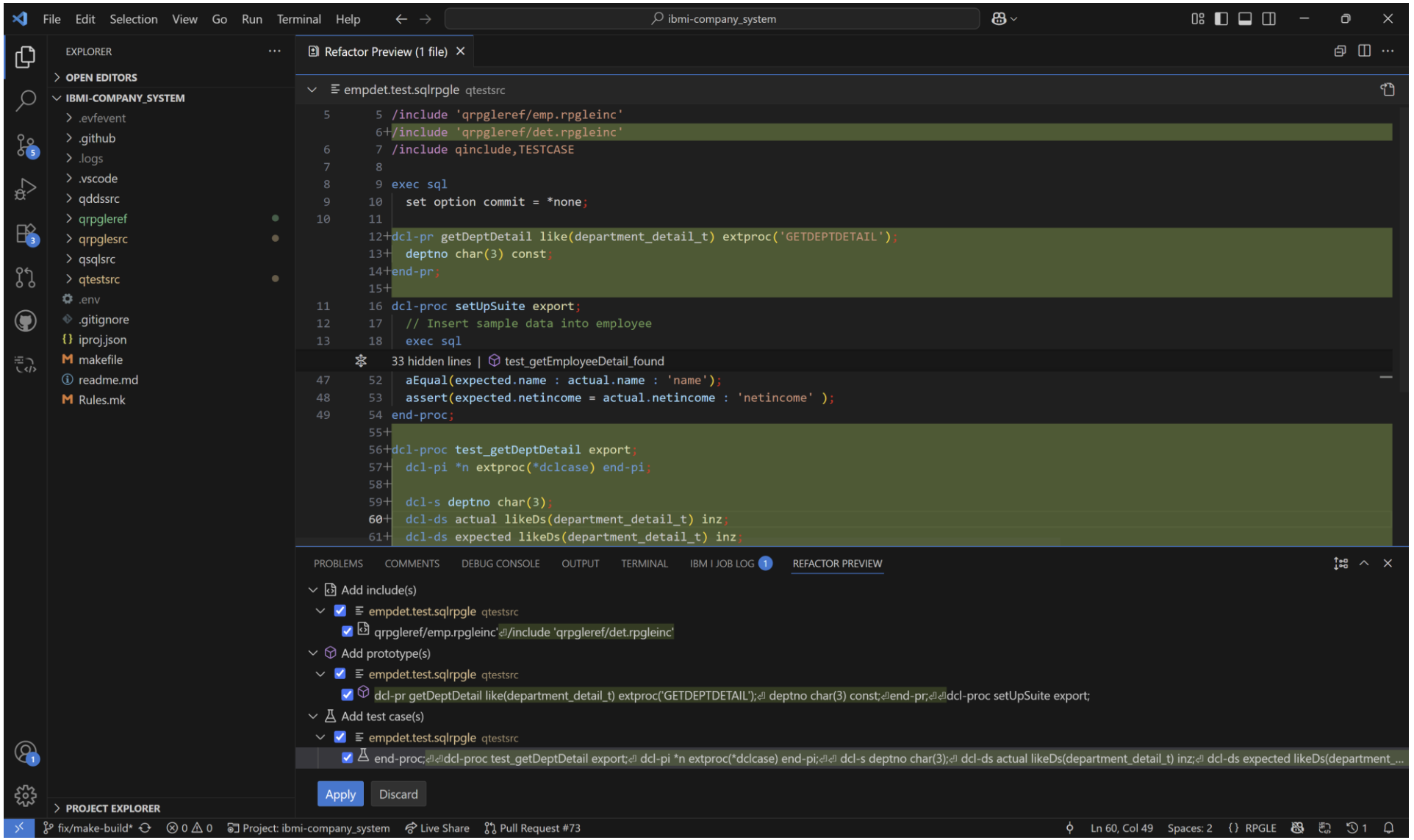
Generating more test stubs (preview mode)



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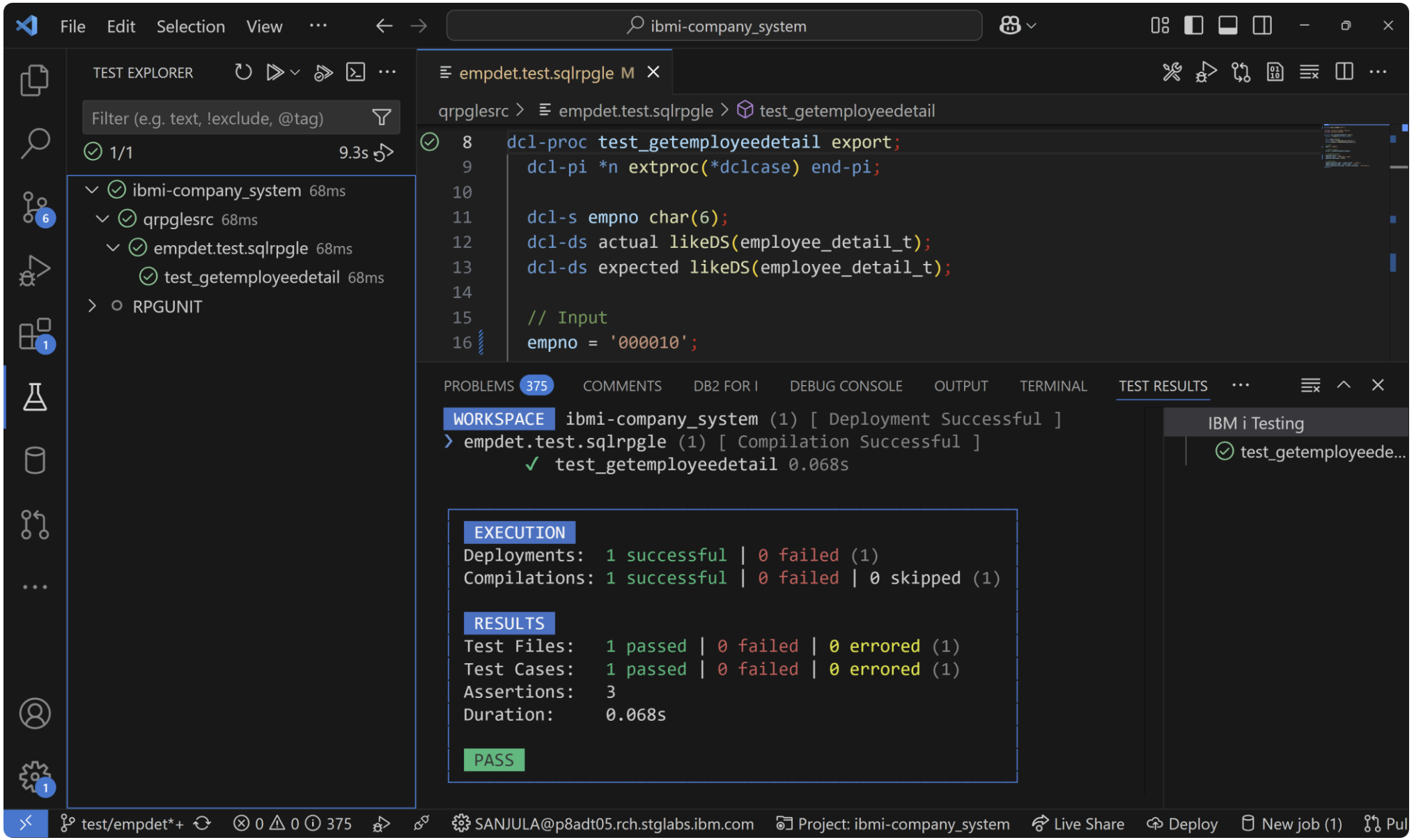
Running unit tests



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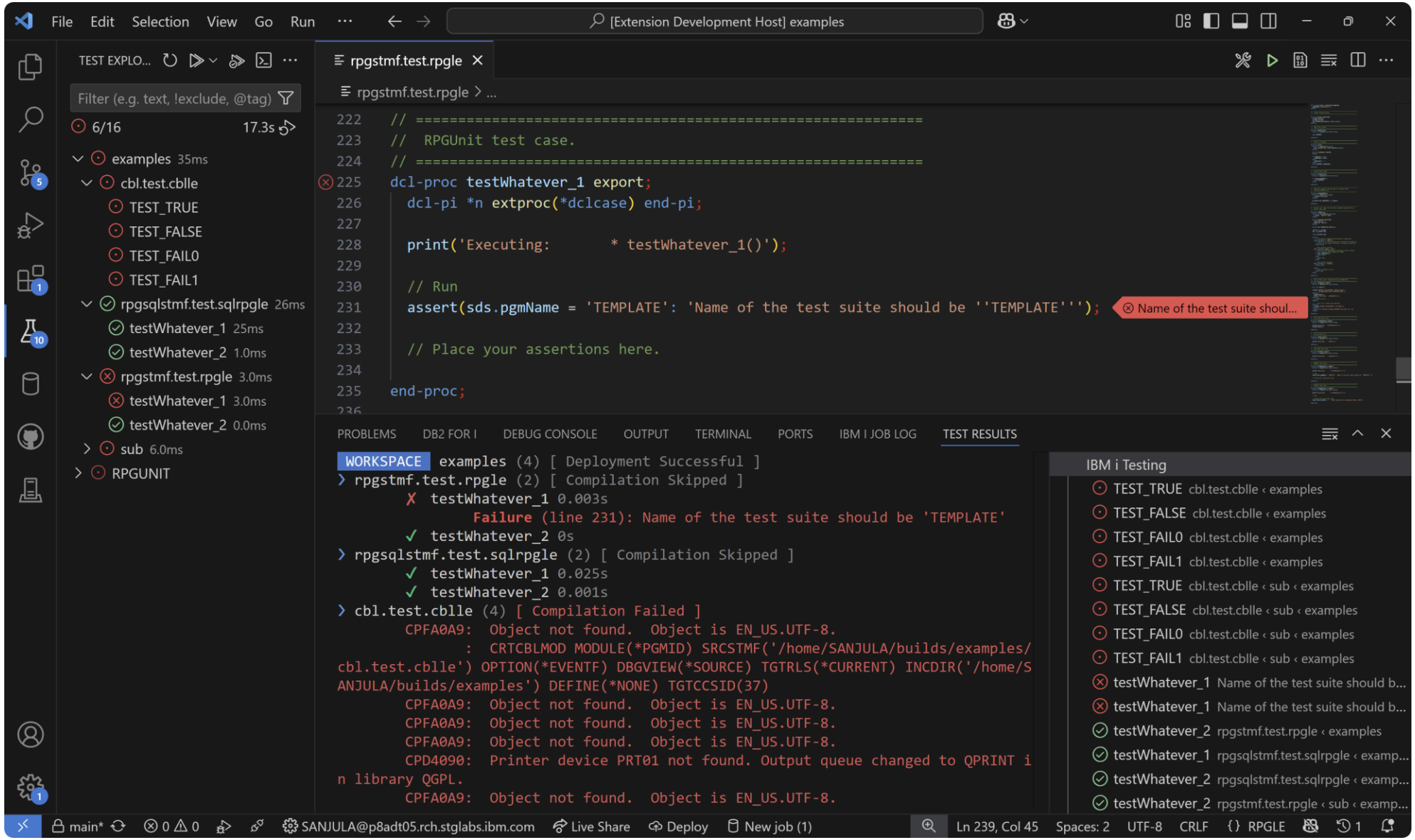
Viewing failures and errors



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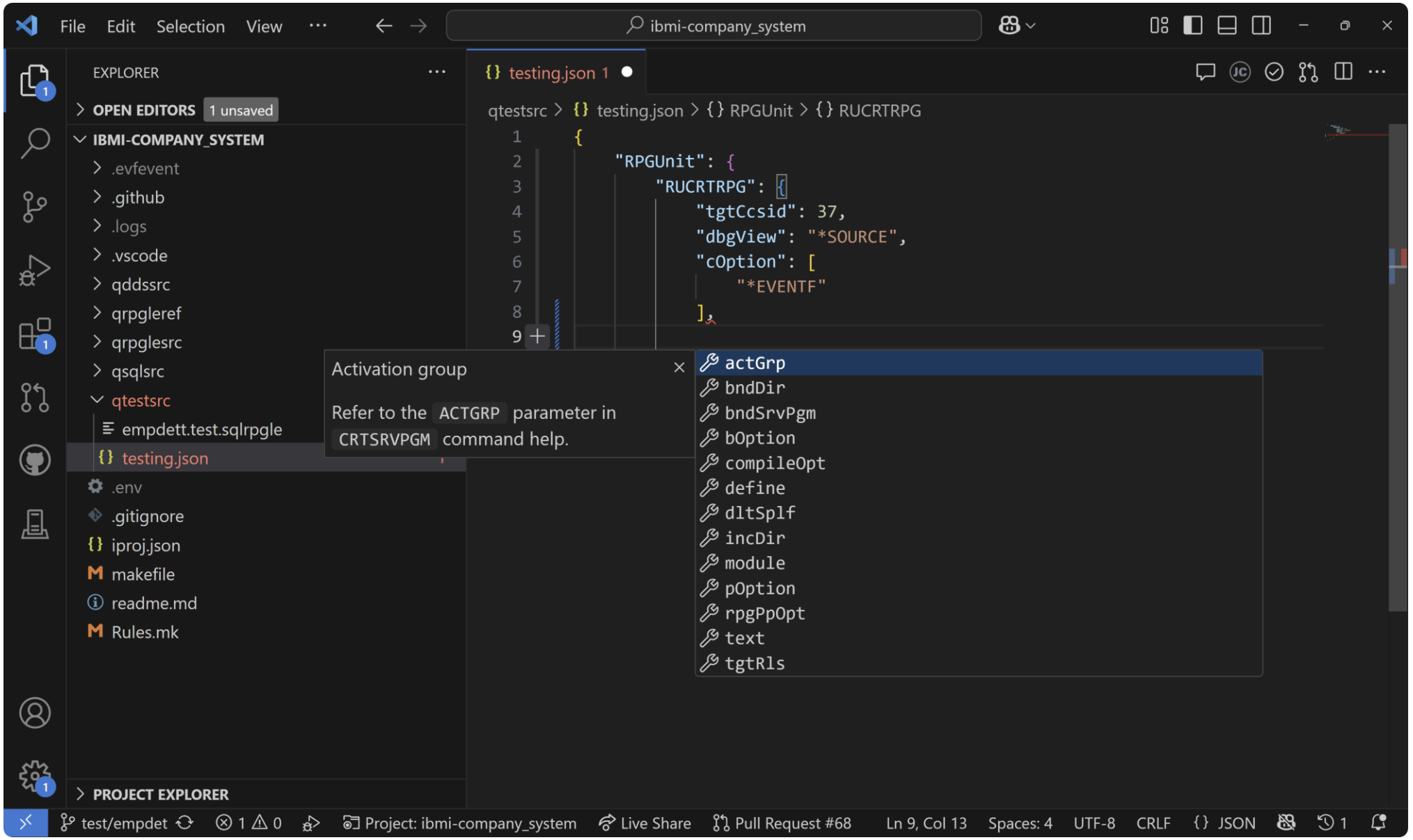
Configuring tests



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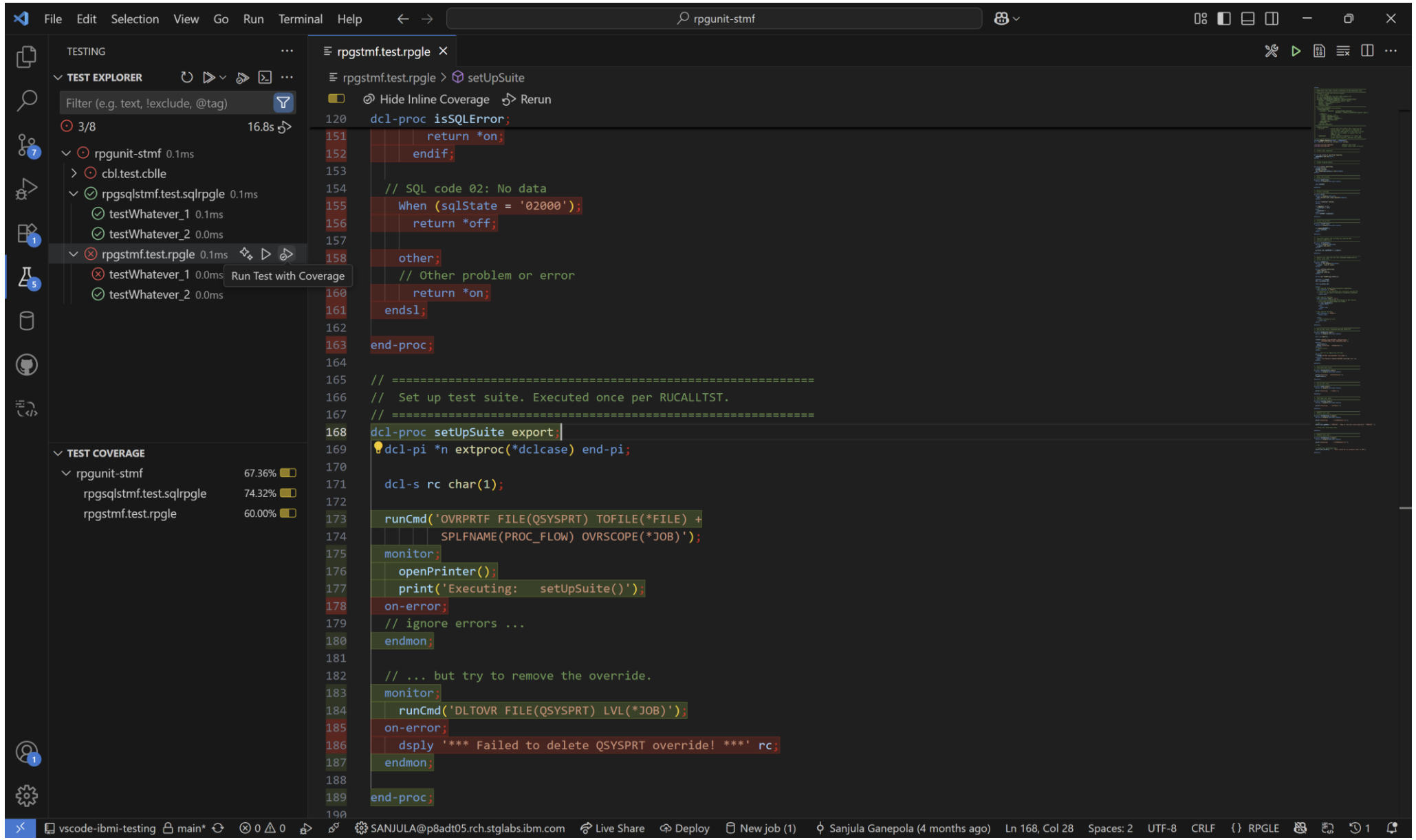
Generating code coverage



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IBM i Testing CLI Demo

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Running tests from a local terminal or in PASE on IBM i

```
-bash-5.1$ itest --help
Usage: itest [options]

The IBM i Testing CLI (itest - v1.1.0) can be used to run unit tests and generate
code coverage results in PASE for RPG and COBOL programs on IBM i. Under the
covers, this extension leverages the RPGUnit testing framework.

✨ Documentation: https://codefori.github.io/docs/developing/testing/overview

Options:
  --v, --version                              Display the version number
  --ld, --localDirectory [path]               Local directory containing tests (preset: ".")
  --id, --ifsDirectory [path]                 IFS directory containing containing tests (preset: ".")
  --l, --library <library>                    Library containing tests.
  --sf, --source-files <sourceFiles...>       Source files to search for tests.
  --ll, --library-list <libraries...>         Libraries to add to the library list.
  --cl, --current-library <library>           The current library to use for the test run.
  --cc, --code-coverage [ccLvl]               Run with code coverage (choices: "*LINE", "*PROC", preset: "*LINE")
  --ct, --coverage-thresholds <threshholds...>  Set the code coverage thresholds (yellow and green). (default:
                                              ["60","90"])
  --sr, --summary-report [path]               Save summary report (preset: "./.itest/summary-report.md")
  --tr, --test-result [path]                  Save test result logs (preset: "./.itest/test-result.log")
  --to, --test-output [path]                  Save test output logs (preset: "./.itest/test-output.log")
  --co, --command-output [path]               Save command output logs (preset: "./.itest/command-output.log")
  --h, --help                                 Display help for command

Examples:
  itest --ld . --id /home/USER/builds/ibmi-company_system --ll RPGUNIT QDEVTOOLS --cl MYLIB
  itest --id /home/USER/builds/ibmi-company_system --ll RPGUNIT QDEVTOOLS --cl MYLIB
  itest --l MYLIB --ll RPGUNIT QDEVTOOLS --cl MYLIB
```


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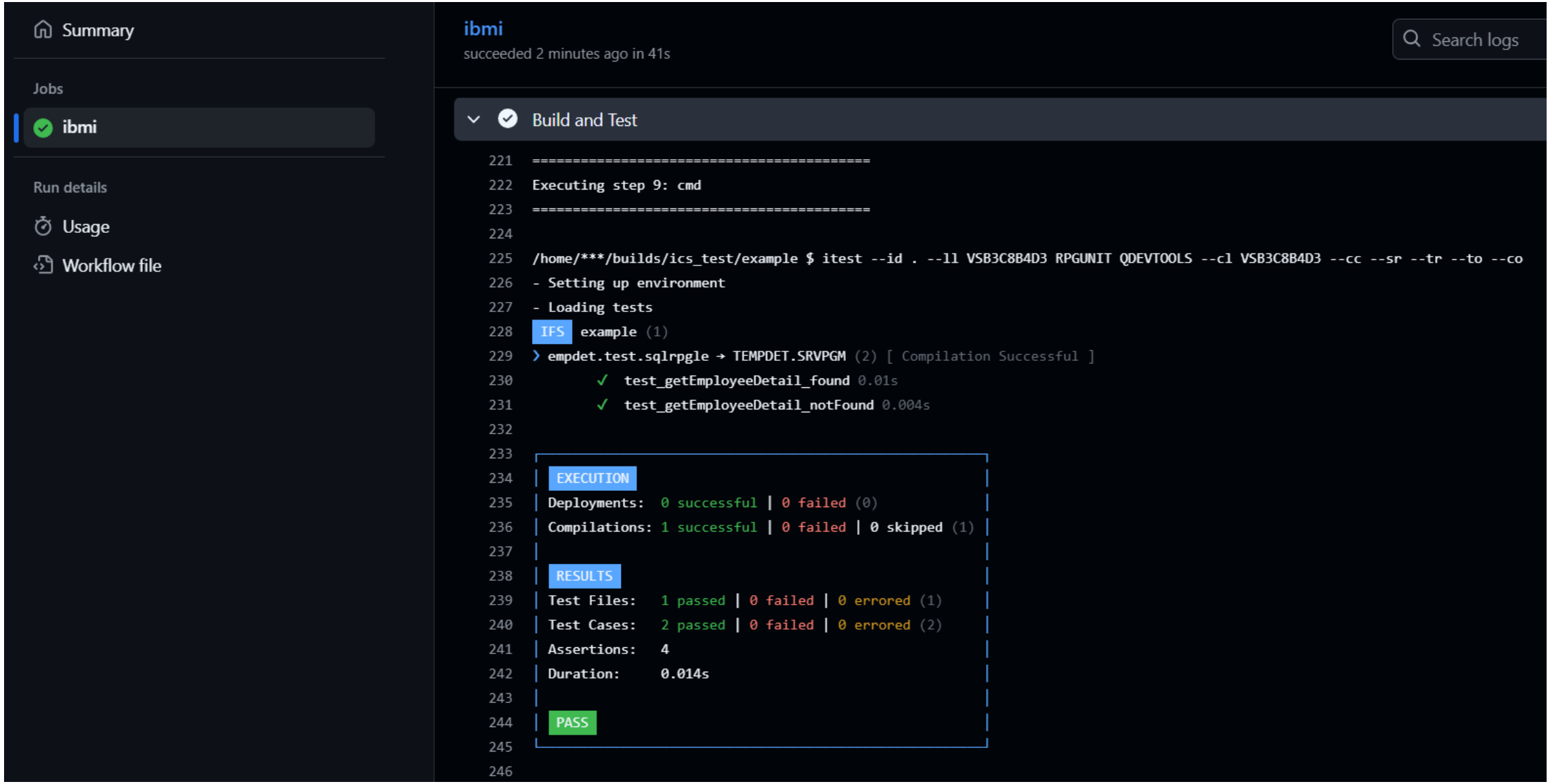
Running tests and code coverage in a pipeline



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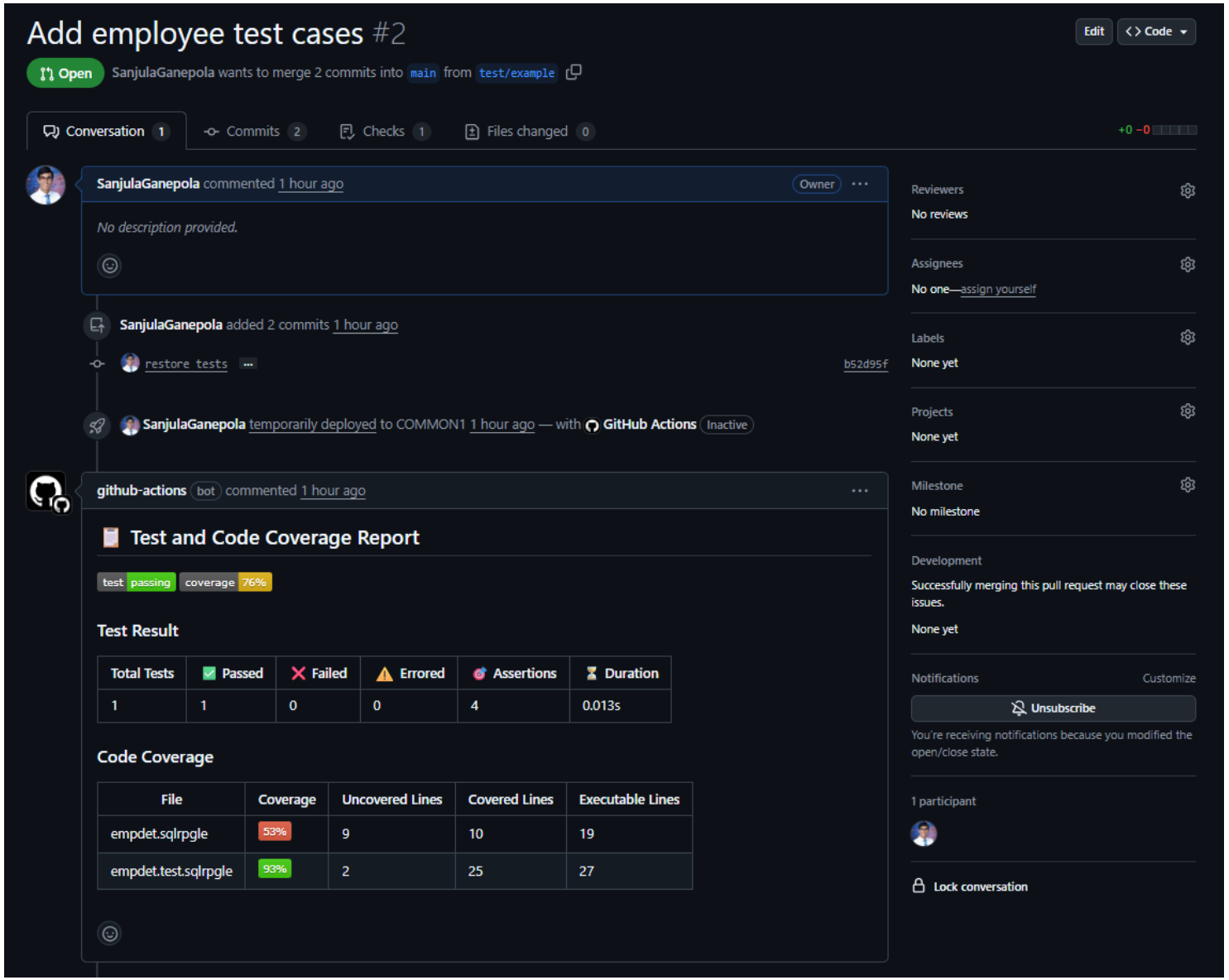
Viewing test and code coverage results



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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

Sample Projects

Company System Demo	https://github.com/IBM/ibmi-company_system
RPGUTILS	https://github.com/IBM/vscode-ibmi-testing/tree/main/examples/rpg-utils

VS Code

Documentation	https://code.visualstudio.com/docs/editor/testing

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