

### Define Test Suites with Annotations

Annotations are single-line comments and belong in the package header. Put a newline between package and procedure annotations.

### Package Annotations

<code>--%suite(description)</code>	Package is a test-suite ( <i>optional</i> description). <i>Mandatory</i>
<code>--%suitepath(org.utplsql)</code>	Groups suites in hierarchical namespaces
<code>--%rollback(auto manual)</code>	Automatic ( <i>default</i> ) / manual transaction control
<code>--%context(description)</code> <code>--%endcontext</code>	Starts/ends sub-suite in suite. Can be nested.
<code>--%disabled</code>	Tests of suite/context won't be executed
<code>--%beforeall(procedure [, ...])</code> <code>--%afterall...</code>	Procedure(s) to run before/after all tests in the suite/context
<code>--%beforeeach(procedure [, ...])</code> <code>--%aftereach...</code>	Procedure(s) to run before/after each test in the suite/context
<code>--%tags(myTag[, ...])</code>	Label a test/context/suite

### Procedure Annotations

<code>--%test(description)</code>	Procedure is a test (with optional description)
<code>--%disabled</code>	Test won't be executed
<code>--%throws(exception [, ...])</code>	Test expects exception(s) to be thrown
<code>--%beforeall, --%afterall</code> <code>--%beforeeach, --%aftereach</code>	Procedure to run before/after all/each tests in the suite/context
<code>--%beforetest(procedure [, ...])</code> <code>--%aftertest(procedure [, ...])</code>	Procedure(s) to be run before/after annotated test
<code>--%tags(myTag[, ...])</code>	Label test

### Run Tests

<code>exec ut.run();</code>	Run all tests to the default reporter (DBMS_OUTPUT)
<code>select * from table( ut.run());</code>	Run all tests and display output as result set

Consider using `utplsql-cli` to easily run tests

### Run specific tests

<code>ut.run ('m y_s uit e_p c kg')</code>	Run only the specified suite by name (current schema)
<code>ut.run ('HR')</code>	Run all tests in specific schema
<code>ut.run('my_suite.test1, my_suite.test2')</code>	Run list of items
<code>ut.run(':my_suite.path')</code>	Run specific suite path

### Run Parameters

<code>a_force_manual_rollback</code>	True/False. Run specified test and don't rollback changes (leaves open transaction)
<code>a_random_test_order</code>	True/False. Run tests in random order
<code>a_color_console</code>	True/False. Color-code output (for Windows see ANSICON)
<code>a_client_charset</code>	Define report's character-set
<code>a_tags</code>	Run tests with any specified tags. Use <code>a_tags =&gt;' -tag1'</code> to exclude a tag

### Reporting: Run alternative Reporter

```
exec ut.run (ut _ju nit _re por ter ());
```

### Reporters

<code>UT_DOCUMENTATION_REPORTER</code>	Textual pretty-print of test results. <i>Default</i>
<code>UT_COVERAGE_HTML_REPORTER</code>	HTML Coverage Report, includes SourceCode
<code>UT_JUNIT_REPORTER</code>	Test results conforming to JUnit 4 and above
<code>UT_REALTIME_REPORTER</code>	Test results and additional information as XML. Allows to show progress information
<code>UT_SONAR_TESTREPORTER</code>	JSON Test results designed for SonarQube

See full list of built-in reporters. See documentation for coverage and reporters.

### Expectation Syntax

#### Base expectation

```
ut.expect( actual_value ).to( matcher );
```

#### Negated expectation

```
ut.expect( actual_value ).not_to( matcher );
```

#### Shortcut syntax (recommended)

```
ut.expect( actual_value ).to_matcher;
ut.expect( actual_value ).not_to_matcher;
```

### Provide additional expectation description

```
ut.expect(1, 'Additional text').to_equal(3);
```

### Simple Matchers

```
ut.expect(1=1).to_be_true();
```

```
ut.expect(1 is null).to_be_false();
```

```
ut.expect(null).to_be_null();
```

```
ut.expect(to_clob('ABC')).to_be_not_null();
```

```
ut.expect(3).to_be_between(1, 3);
```

```
ut.expect(3).to_be_greater_or_equal(2);
```

```
ut.expect(2).to_be_greater_than(1);
```

```
ut.expect(3).to_be_less_or_equal(3);
```

```
ut.expect(3).to_be_less_than(4);
```

### Equality Matchers

```
ut.expect('a dog').to_equal('a dog',
    a_nulls_are_equal => false);
```

`a_nulls_are_equal` is **true** by default

#### equal on objects

```
ut.expect(anydata.convertObject(l_expect))
    .to_equal(anydata.convertObject(l_actual));
```

#### equal on collections

```
ut.expect(anydata.convertCollection(l_expect))
    .to_equal(anydata.convertCollection(l_actual));
```

It's not possible to compare rowtypes and records directly. You have to wrap them in a table of record, select from them and use cursor comparison

### Advanced Matchers

```
be_like ut.expect('Lorem ipsum')
        .to_be_like('re%su');
```

```
be_like ut.expect('Lorem ipsum')
with escape .to_be_like(
    a_mask => '%rem\%',
    a_escape_char => '\');
see Oracle like operator
```

```
match ut.expect('some value')
        .to_match('^some.*');
```

```
match ut.expect('123-456-ABcd')
with options .to_match(
    a_pattern => '\d{3}-\d{3}-[a-z]',
    a_modifiers => 'i');
See regexp_like function
```

### Cursor Comparison

#### Basic example

```
open l_expected for select * from all_objects;
open l_actual for select * from all_objects;
ut.expect(l_actual)
    .to_equal(l_expected)
    .join_by('COLUMN_NAME')
    .exclude(ut_varchar2_list('ID', 'SOMECOLUMN'))
```

#### Special Matchers

```
ut.expect(l_actual).to_have_count(5);
ut.expect(l_actual).to_be_empty();
```

### Helpers

#### Type: List of strings

```
ut_varchar2_list('String 1', 'String 2', ...)
```

#### Type: List of reporters

```
ut_reporters(ut_documentation_reporter(),
    _reporter())
```

#### Select all tests

```
select * from table(
    ut_runner.get_suites_info(USER, 'PACKAGE_NAME')
    where item_type = 'UT_TEST');
```