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Testworks is a Dylan unit testing library.

See also: Testworks Reference

1.1 Quick Start

For the impatient, this section summarizes most of what you need to know to use Testworks.

Add use testworks; to both your test library and test module.

Tests contain arbitrary code and at least one assertion:

```dylan
define test test-fnl ()
let v = do-something();
    assert-equal(fnl(v), "expected-value");
    assert-equal(fnl(v, key: 7), "seven", "regression test for bug/12345");
end;
```

If a test contains no assertions it will be marked “not implemented” when the tests are run.

See also: assert-true, assert-false, assert-signals, and assert-no-errors. Each of these takes an optional description argument, which can be used to indicate the intent of the assertion if it isn’t clear.
Benchmarks do not require any assertions and are automatically given the “benchmark” tag:

```dylan
define benchmark benchmark-fn1 ()
  fn1()
end;
```

Your test executable should call `run-test-application` to parse the Testworks command-line options and run the tests. It may be called with no arguments to run all tests and benchmarks:

```dylan
run-test-application() // Run all tests and benchmarks.
```

Use `my-test-app --help` to see the Testworks command-line options, which provide various output formats, ways to run specific tests, etc.

See `Suites` for a way to organize large test suites.

## 1.2 Defining Tests

### 1.2.1 Assertions

An assertion accepts an expression to evaluate and report back on, saying if the expression passed, failed, or signaled an error. As an example, in

```
assert-true(foo > bar)
```

the expression `foo > bar` is compared to `#f`, and the result is recorded by the test harness. Failing (or crashing) assertions do not cause the test to terminate; all assertions are run unless the test itself signals an error. (**NOTE:** See https://github.com/dylan-lang/testworks/issues/86 for plans to change this behavior.)

See the `Testworks Reference` for detailed documentation on the available assertion macros:

- `assert-true`
- `assert-false`
- `assert-equal`
- `assert-not-equal`
- `assert-signals`
- `assert-no-errors`
- `assert-instance?`
- `assert-not-instance?`

Each of these takes an optional description string, after the required arguments, which will be displayed if the assertion fails. If the description isn’t provided, Testworks makes one from the expressions passed to the assertion macro. For example, `assert-true(2 > 3)` produces this failure message:

```
(2 > 3) is true failed [expression "(2 > 3)" evaluates to #f]
```

In general, Testworks should be pretty good at reporting the actual values that caused the failure so it shouldn’t be necessary to include them in the description all the time.

In the future, there will be support for failures to include the source file line number for the assertion.
1.2.2 Tests

Tests contain assertions and arbitrary code needed to support those assertions. Each test may be part of a suite. Use the `test-definer` macro to define a test:

```sbcl
define test NAME (#key EXPECTED-FAILURE?, TAGS)
  BODY
end;
```

For example:

```sbcl
define test my-test ()
  assert-equal(2, 3);
  assert-equal(#f, #f);
  assert-true(identity(#t), "Check identity function");
end;
```

Note: if a test doesn’t execute any assertions then it is marked as “not implemented” in the test results.

The result looks like this:

```
$ _build/bin/my-test
Running test my-test:
  2 = 3: [2 (from expression "2") and 3 (from expression "3") are not =.]
  FAILED in 0.000256s
my-test FAILED in 0.000256 seconds:
  Ran 0 suites: 0 passed (100.00000%), 0 failed, 0 skipped, 0 not implemented, 0 crashed
  Ran 1 test: 0 passed (0.0%), 1 failed, 0 skipped, 0 not implemented, 0 crashed
  Ran 0 benchmarks: 0 passed (0.0%), 0 failed, 0 skipped, 0 not implemented, 0 crashed
  Ran 3 checks: 2 passed (66.666672%), 1 failed, 0 skipped, 0 not implemented, 0 crashed
```

Tests may be tagged with arbitrary strings, providing a way to select or filter out tests to run:

```sbcl
define test my-test-2 (tags: #{"huge"})
  ...huge test that takes a long time...
end test;
define test my-test-3 (tags: #{"huge", "verbose"})
  ...test with lots of output...
end test;
```

Tags can then be passed on the Testworks command-line. For example, this skips both of the above tests:

```
$ _build/bin/my-test-suite-app --tag=-huge --tag=-verbose
```

Negative tags take precedence, so `--tag=huge --tag=-verbose` runs `my-test-2` and skips `my-test-3`.

If the test is expected to fail, or fails under some conditions, Testworks can be made aware of this:
define test failing-test (expected-failure?: #t)
  assert-true(#f);
end test;

define test fails-on-windows
  (expected-failure?: method () $os-name = #"win32" end)
  if ($os-name = #"win32")
    assert-false(#t);
  else
    assert-true(#t);
  end if;
end test;

A test that is expected to fail and then fails is considered to be a passing test. If the test succeeds unexpectedly, it is considered a failing test.

Test setup and teardown is accomplished with normal Dylan code using block () ... cleanup ... end;

define test foo ()
  block ()
    do-setup-stuff();
    assert-equal(...);
    assert-equal(...);
  cleanup
    do-teardown-stuff()
  end
end;

1.2.3 Benchmarks

Benchmarks are like tests except for:

- They do not require any assertions. (They pass unless they signal an error.)
- They are automatically assigned the “benchmark” tag.

The benchmark-definer macro is like test-definer:

define benchmark my-benchmark ()
  ...body...
end;

Benchmarks may be added to suites:

define suite my-benchmarks-suite ()
  benchmark my-benchmark;
end;

Benchmarks and tests may be combined in the same suite. If you do that, tags may be used to run only the benchmarks (with --tag=benchmark) or only the tests (with --tag=-benchmark). If you are using suites anyway, you may wish to put benchmarks into a suite of their own. Example:

define suite strings-tests () ...only tests... end;
define suite strings-benchmarks () ...only benchmarks... end;
define suite strings-test-suite ()
  suite strings-tests;

(continues on next page)
1.2.4 Suites

Suites are an optional feature that may be used to organize your tests into a hierarchy. Suites contain tests, benchmarks, and other suites. A suite is defined with the `suite-definer` macro. The format is:

```
define suite NAME (#key setup-function, cleanup-function)
  test TEST-NAME;
  benchmark BENCHMARK-NAME;
  suite SUITE-NAME;
end;
```

For example:

```
define suite first-suite ()
  test my-test;
  test example-test;
  test my-test-2;
  benchmark my-benchmark;
end;
define suite second-suite ()
  suite first-suite;
  test my-test;
end;
```

Suites can specify setup and cleanup functions via the keyword arguments `setup-function` and `cleanup-function`. These can be used for things like establishing database connections, initializing sockets and so on.

A simple example of doing this can be seen in the http-server test suite:

```
define suite http-test-suite (setup-function: start-sockets)
  suite http-server-test-suite;
  suite http-client-test-suite;
end;
```

Suites can be run via `run-test-application`. It should be called as the main function in an executable and will parse command-line args, execute tests and benchmarks, and generate reports. See the next section for details.

1.2.5 Interface Specification Suites

The `interface-specification-suite-definer` macro creates a normal test suite, much like `define suite` does, but based on an interface specification. For example,

```
define interface-specification-suite time-specification-suite ()
  sealed instantiable class <time> (<object>);
  constant $utc :: <zone>;
  variable *zone* :: <zone>;
  sealed generic function in-zone (<time>, <zone>) => (<time>);
```

(continues on next page)
The specification usually has one clause, or “spec”, for each name exported from your public interface module. Each spec creates a test named test-(name)-specification to verify that the implementation matches the spec for (name). For example, by checking that the names are bound, that their bindings have the correct types, that functions accept the right number and types of arguments, etc.

Specification suites are otherwise just normal suites. They may include other arbitrary tests and child suites if desired:

```dylan
define interface-specification-suite time-suite ()
  ...
  test test-time-still-moving-forward;
  suite time-travel-test-suite;
end;
```

This also means that if your interface is large you may use multiple interface-specification-suite-definer forms and then group them together.

See interface-specification-suite-definer for more details on the various kinds of specs.

## 1.3 Organizing Tests for One Library

If you don’t use suites, the only organization you need is to name your tests and benchmarks uniquely, and you can safely skip the rest of this section. If you do use suites, read on…

Tests are used to combine related assertions into a unit, and suites further organize related tests and benchmarks. Suites may also contain other suites.

It is common for the test suite for library xxx to export a single test suite named xxx-test-suite, which is further subdivided into sub-suites, tests, and benchmarks as appropriate for that library. Some suites may be exported so that they can be included as a component suite in combined test suites that cover multiple related libraries. (The alternative to this approach is running each library’s tests as a separate executable.)

**Note:** It is an error for a test to be included in a suite multiple times, even transitively. Doing so would result in a misleading pass/fail ratio, and it is more likely to be a mistake than to be intentional.

The overall structure of a test library that is intended to be included in a combined test library may look something like this:

```dylan
// --- library.dylan ---

define library xxx-tests
  use common-dylan;
  use testworks;
  use xxx;  // the library you are testing
  export xxx-tests;  // so other test libs can include it
end;

define module xxx-tests
  use common-dylan;
  use testworks;
  use xxx;  // the module you are testing
  export xxx-test-suite;  // so other suites can include it
```

(continues on next page)
1.4 Running Your Tests As A Stand-alone Application

If you don’t need to export any suites so they can be included in a higher-level combined test suite library (i.e., if you’re happy running your test suite library as an executable) then you can simply call run-test-application to parse the standard testworks command-line options and run the specified tests:

```dylan
run-test-application(); // if not using suites
run-test-application(my-suite); // if using suites
```

and you can skip the rest of this section.

If you need to export a suite for use by another library, then you must also define a separate executable library, traditionally named “xxx-test-suite-app”, which calls run-test-application(xxx-test-suite).

Here’s an example of such an application library:

1. The file library.dylan which must use at least the library that exports the test suite, and testworks:

   ```dylan
   Module:      dylan-user
   Synopsis:    An application library for xxx-test-suite
   
   define library xxx-test-suite-app
     use xxx-test-suite;
     use testworks;
   end;
   
   define module xxx-test-suite-app
     use xxx-test-suite;
     use testworks;
   end;
   ```

2. The file xxx-test-suite-app.dylan which simply contains a call to the method run-test-application with the suite-name as an argument:

   ```dylan
   ```
Module: xxx-test-suite-app
run-test-application(xxx-test-suite);

3. The file xxx-test-suite-app.lid which specifies the names of the source files:

Library: xxx-test-suite-app
Target-type: executable
Files: library.dylan
    xxx-test-suite-app.dylan

Once a library has been defined in this fashion it can be compiled into an executable with dylan-compiler
-build xxx-test-suite-app.lid and run with xxx-test-suite-app --help.

1.5 Reports

Testworks provides the user with multiple report functions:

Summary (the default) Prints out only a summary of how many assertions, tests and suites were executed, passed,
    failed or crashed.

Failures  Prints out only the list of failures and a summary.

XML      Outputs XML that directly matches the suite/test/assertion tree structure, with full detail.

Surefire Outputs XML is Surefire format. This elides information about specific assertions. This format is supported
    by various tools such as Jenkins.

None    Prints nothing at all.

Use the --report-file option to redirect the report to a file.

1.6 Comparing Test Results

* To be filled in *

Quick version:

• (master branch)$ my-test-suite --report json --report-file out1.json
• (your branch)$ my-test-suite --report json --report-file out2.json
• $ testworks-report out1.json out2.json
2.1 The Testworks Module

2.1.1 Suites, Tests, and Benchmarks

test-definer Macro
Define a new test.

Signature  define test test-name (#key expected-failure?, tags) body end

Parameters

• test-name – Name of the test; a Dylan variable name.

• expected-failure? (#key) – An instance of either <boolean> or <function>. This indicates whether or not the test is expected to fail.

• tags (#key) – A list of strings to tag this test.

Tests may contain arbitrary code, plus any number of assertions. If any assertion fails the test will fail, but any remaining assertions in the test will still be executed. If code outside of an assertion signals an error, the test is marked as "crashed" and remaining assertions are skipped.

If expected-failure? is set to #t or a function that when executed returns a true value, then the test will be expected to fail. Such a failure will be treated as a successful test run. If the test passes rather than failing, then that will be considered a test failure. This option has no effect on tests which are not implemented or which have crashed.

tags provide a way to select or filter out specific tests during a test run. The Testworks command-line (provided by run-test-application) provides a --tag option for this purpose.
benchmark-definer Macro

Define a new benchmark.

**Signature**

define benchmark name (#key expected-failure?, tags) body end

**Parameters**

- **name** – Name of the benchmark; a Dylan variable name.
- **expected-failure?** (#key) – An instance of either `<boolean>` or `<function>`. This indicates whether or not the test is expected to fail.
- **tags** (#key) – A list of strings to tag this benchmark.

Benchmarks may contain arbitrary code and do not require any assertions. If the benchmark signals an error it is marked as “crashed”. Other than this, and some differences in how the results are displayed, benchmarks are the same as tests.

suite-definer Macro

Define a new test suite.

**Signature**

define suite suite-name (#key setup-function cleanup-function) body end

**Parameters**

- **suite-name** – Name of the suite; a Dylan variable name.
- **setup-function** (#key) – A function to perform setup before the suite starts.
- **cleanup-function** (#key) – A function to perform teardown after the suite finishes.

Suites provide a way to group tests and other suites into a single executable unit. Suites may be nested arbitrarily. 

*setup-function* is executed before any tests or sub-suites are run. If *setup-function* signals an error the entire suite is skipped and marked as “crashed”.

*cleanup-function* is executed after all sub-suites and tests have completed, regardless of whether an error is signaled.

interface-specification-suite-definer Macro

Define a test suite to verify an API.

**Signature**

define interface-specification-suite suite-name () specs end;

**Parameters**

- **suite-name** – Name of the suite; a Dylan variable name.

This macro is useful to verify that public interfaces to your library don’t change unintentionally.

*specs* are clauses separated by semicolons, specifying the attributes of an exported name. Each *spec* looks much like the definition of the name being tested. The following example has one of each kind of spec:

```dylan
define interface-specification-suite time-specification-suite ()
  sealed instantiable abstract class <time> (<object>);
  generic function parse-time (<string>, #"key") => (<time>);
  variable *foo* :: <string>;
  constant $unix-epoch :: <time>
end;
```

The following sections explain the syntax of each kind of spec in detail. Note that there is no way to verify macros automatically and therefore there is no “macro” spec.
Syntax: modifiers class name (superclasses);

modifiers

sealed or open, primary or free, abstract or concrete, and instantiable. Currently the first two pairs are unused, but you may want to specify them anyway, to keep the spec in sync with the code.

If instantiable is specified, Testworks will try to make an instance of name by calling make with no arguments. If your class requires init arguments, you must define a method on make-test-instance:

```dylan
define method make-test-instance
  (class == <my-class>) => (instance :: <my-class>)
  make(<my-class>, ...init args...)
end
```

name

Name of the class to verify.

superclasses

Comma-separated list of superclass names.

function specs

Syntax: modifiers function name (parameter-types) => (value-types);

modifiers
generic

name

Name of the function. Note that function specs should be used for functions created with define function (which are really just bare methods bound to a name as with define constant m = method() ... end) and for generic functions.

parameter-types

Comma-separated list of parameter type names, possibly empty. Where #rest, #key, and #all-keys appear in the corresponding function definition, use "rest", "key", and "all-keys" instead (i.e., with double quotes). Keyword arguments are specified without type qualifiers. Examples from the dylan-test-suite:

```dylan
open generic function make
  (<type>, #"rest", #"key", #"all-keys") => (<object>);
open generic function copy-sequence
  (<sequence>, #"key", #"start", #"end") => (<sequence>);
```

value-types

Comma-separated list of return value type names, possibly empty.

variable specs

Syntax: variable name :: type;

name

Name of the variable.

type
Type of the variable.

constant specs

Syntax: constant name :: type;

name

Name of the constant.

type

Type of the constant.

2.1.2 Assertions

Assertions are the smallest unit of verification in Testworks. They must appear within the body of a test.

Assertion macros that accept an argument that is the expected value as well as the expression that is to be tested typically expect the value first and the expression second. The macros don’t always require that this be the case:

```plaintext
assert-not-equal(5, 2 + 2);
assert-instance?(<integer>, 2 + 2);
```

All assertion macros accept a description of what is being tested as an optional final argument. The description should be stated in the positive sense. For example:

```plaintext
assert-equal(2, 2 + 2, "2 + 2 equals 2")
```

These are the available assertion macros:

- `assert-true`
- `assert-false`
- `assert-equal`
- `assert-not-equal`
- `assert-signals`
- `assert-no-errors`
- `assert-instance?`
- `assert-not-instance?`

**assert-true Macro**

Assert that an expression evaluates to a true value. Importantly, this does not mean the expression is exactly #t, but rather that it is not #f. If you want to explicitly test for equality to #t use `assert-equal(#t, ...)` or `assert-true(#t = ...)`.  

**Signature**  
assert-true expression [ description ]

**Parameters**

- `expression` – any expression
- `description` – A description of what the assertion tests. This should be stated in positive form, such as “two is less than three”. If no description is supplied one will be automatically generated based on the text of the expression.

**Example**
assert-true(has-fleas?(my-dog))
assert-true(has-fleas?(my-dog), "my dog has fleas")

assert-true Macro
Assert that an expression evaluates to #f.

Signature  assert-true expression [ description ]

Parameters
• expression – any expression
• description – A description of what the assertion tests. This should be stated in positive form, such as “three is less than two”. If no description is supplied one will be automatically generated based on the text of the expression.

Example
assert-true(3 < 2)
assert-true(6 = 7, "six equals seven")

assert-equal Macro
Assert that two values are equal using = as the comparison function. Using this macro is preferable to using assert-true(a = b) because the failure messages are much better when comparing certain types of objects, such as collections.

Signature  assert-equal expression1 expression2 [ description ]

Parameters
• expression1 – any expression
• expression2 – any expression
• description – A description of what the assertion tests. This should be stated in positive form, such as “two equals two”. If no description is supplied one will be automatically generated based on the text of the two expressions.

Example
assert-equal(2, my-complicated-method())
assert-equal(this, that, "this and that are the same")

assert-not-equal Macro
Assert that two values are not equal using ~= as the comparison function. Using this macro is preferable to using assert-true(a ~= b) or assert-false(a = b) because the generated failure messages can be better.

Signature  assert-not-equal expression1 expression2 [ description ]

Parameters
• expression1 – any expression
• expression2 – any expression
• description – A description of what the assertion tests. This should be stated so as to express what the correct result would be, for example “two does not equal three”. If no description is supplied one will be automatically generated based on the text of the two expressions.

Example
assert-not-equal(2, my-complicated-method())
assert-not-equal(this, that, "this does not equal that")

**assert-signals Macro**
Assert that an expression signals a given condition class.

**Signature** assert-signals condition, expression [ description ]

**Parameters**
- **condition** – an expression that yields a condition class
- **expression** – any expression
- **description** – A description of what the assertion tests. This should be stated in positive form, such as “two is less than three”. If no description is supplied one will be automatically generated based on the text of the expression.

The assertion succeeds if the expected condition is signaled by the evaluation of expression.

**Example**

```
assert-signals(<division-by-zero-error>, 3 / 0)
assert-signals(<division-by-zero-error>, 3 / 0, "my super special description")
```

**assert-no-errors Macro**
Assert that an expression does not signal any errors.

**Signature** assert-no-errors expression [ description ]

**Parameters**
- **expression** – any expression
- **description** – A description of what the assertion tests. This should be stated in positive form, such as “two is less than three”. If no description is supplied one will be automatically generated based on the text of the expression.

The assertion succeeds if no error is signaled by the evaluation of expression.

Use of this macro is preferable to simply executing expression as part of the test body for two reasons. First, it can clarify the purpose of the test, by telling the reader “here’s an expression that is explicitly being tested, and not just part of the test setup.” Second, if the assertion signals an error the test will record that fact and continue, as opposed to taking a non-local exit. Third, it will show up in generated reports.

**Example**

```
assert-no-errors(my-hairy-logic())
assert-no-errors(my-hairy-logic(), "hairy logic completes without error")
```

**assert-instance? Macro**
Assert that the result of an expression is an instance of a given type.

**Signature** assert-instance? type expression [ description ]

**Parameters**
- **type** – The expected type.
- **expression** – An expression.
• **description** – A description of what the assertion tests. This should be stated in positive form, such as “two is less than three”. If no description is supplied one will be automatically generated based on the text of the expression.

**Discussion**

**Warning:** The arguments to this assertion follow the typical argument ordering of Testworks assertions with the desired value before the expression that represents the test. As such, the desired **type** is the first parameter to this assertion while it is the second parameter for `instance?`.

**Example**

```scheme
(assert-instance? (<type>, subclass(<string>)));
(assert-instance? (<type>, subclass(<string>),
"subclass returns type");
```

**assert-not-instance?** Macro

Assert that the result of an expression is **not** an instance of a given class.

**Signature** `assert-not-instance? type expression [ description ]`

**Parameters**

• **type** – The type.

• **expression** – An expression.

• **description** – A description of what the assertion tests. This should be stated in positive form, such as “two is less than three”. If no description is supplied one will be automatically generated based on the text of the expression.

**Discussion**

**Warning:** The arguments to this assertion follow the typical argument ordering of Testworks assertions with the desired value before the expression that represents the test. As such, the desired **type** is the first parameter to this assertion while it is the second parameter for `instance?`.

**Example**

```scheme
(assert-not-instance?(limited(<integer>, min: 0), -1));
(assert-not-instance?(limited(<integer>, min: 0), -1,
"values below lower bound are not instances");
```

### 2.1.3 Checks

Checks are deprecated; use **Assertions** instead. The main difference between checks and assertions is that the check macros require a description as their first argument, whereas assertions do not.

These are the available checks:

• **check**
• check-true
• check-false
• check-equal
• check-instance?
• check-condition

**check Macro**
Perform a check within a test.

**Signature** check name function #rest arguments

**Parameters**
- **name** – An instance of <string>.
- **function** – The function to check.
- **arguments** (#rest) – The arguments for function.

**Example**
```
check("Test less than operator", \<, 2, 3)
```

**check-condition Macro**
Check that a given condition is signalled.

**Signature** check-condition name expected expression

**Parameters**
- **name** – An instance of <string>.
- **expected** – The expected condition class.
- **expression** – An expression.

**Example**
```
check-condition("format-to-string crashes when missing an argument", <error>, format-to-string("Hello %s"));
```

**check-equal Macro**
Check that 2 expressions are equal.

**Signature** check-equal name expected expression

**Parameters**
- **name** – An instance of <string>.
- **expected** – The expected value of expression.
- **expression** – An expression.

**Example**
```
check-equal("condition-to-string of an error produces correct string", "Hello", condition-to-string(make(<simple-error>, format-string: →"Hello")));
```

**check-false Macro**
Check that an expression has a result of #f.
Signature  check-false name expression
Parameters
  • name – An instance of <string>.
  • expression – An expression.
Example
  check-false("unsupplied?($f) == $f", unsupplied?($f));

check-instance? Macro
Check that the result of an expression is an instance of a given type.
Signature  check-instance? name type expression
Parameters
  • name – An instance of <string>.
  • type – The expected type.
  • expression – An expression.
Example
  check-instance?("subclass returns type", <type>, subclass(<string>));

check-true Macro
Check that the result of an expression is not #f.
Signature  check-true name expression
Parameters
  • name – An instance of <string>.
  • expression – An expression.
Discussion  Note that if you want to explicitly check if an expression evaluates to #t, you should use check-equal.
Example
  check-true("unsupplied?($unsupplied)", unsupplied?($unsupplied));

2.1.4 Test Execution

run-test-application Function
Run a test suite or test as part of a stand-alone test executable.
Signature  run-test-application #rest suite-or-test => ()
Parameters
  • suite-or-test – (optional) An instance of <suite> or <runnable>. If not supplied then all tests and benchmarks are run.

This is the main entry point to run a set of tests in Testworks. It parses the command-line and based on the specified options selects the set of suites or tests to run, runs them, and generates a final report of the results.
Internally, `run-test-application` creates a `<test-runner>` based on the command-line options and then calls `run-tests` with the runner and `suite-or-test`.

**test-option Function**

Return an option value passed on the test-application command line.

**Signature**

```
test-option name #key default => value
```

**Parameters**

- `name` – An instance of type `<string>`.
- `default (#key)` – An instance of type `<string>`.

**Values**

- `value` – An instance of type `<string>`.

Returns an option value passed to the test on the test application command line, in the form `*name* = *value*`. If no option value was given, the `default` value is returned if one was supplied, otherwise an error is signalled.

This feature allows information about external resources, such as path names of reference data files, or the hostname of a test database server, to be supplied on the command line of the test application and retrieved by the test.

**test-temp-directory Function**

Retrieve a unique temporary directory for the current test to use.

**Signature**

```
test-temp-directory => (directory :: <directory-locator>)
```

Returns a directory (a `<directory-locator>`) that may be used for temporary files created by the test or benchmark. The directory is created the first time this function is called for each test or benchmark and is not deleted after the test run is complete in case it’s useful for post-mortem analysis. The directory is named `_test/<user>-<timestamp>/<test-name>` and is rooted at `$DYLAN`, if defined, or in the current directory otherwise.
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