

Frequently Asked Questions

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1 General

1.1 How do I test error conditions?

Define a helper function `test_for_error` that uses `tryCatch`. If your test results in an error that does not match, then the test fails and the actual error will be included in your test results.

```
test_for_error <- function(code, expected_regexp) {
  tryCatch({
    code
    return("No error returned")
  }, error = function(e) {
    if(grepl(expected_regexp, e$message)) return(TRUE)
    return(c(e$message, "Did not match:-", expected_regexp))
  })
}
```

For example, here is a function that will throw an error for a bad argument

```
add_four <- function(x) {
  if(! is.numeric(x)) stop("x must be numeric")
  return(x+4)
}
```

Then we can test the argument check like this

```
ok(test_for_error(add_four("a"), "must be numeric"), "add_four() argument not numeric throws error")
ok - add_four() argument not numeric throws error
```

1.2 How do I test multivalued results?

Use `all.equal(...)`

```
a <- c(1,2,3)
b <- 1:3
ok(all.equal(a,b), "a and b are equal")
ok - a and b are equal
```

Alternatively, the following helper function will give coloured output showing what's different

```

cmp <- function(a, b) {
  if(identical(all.equal(a,b), TRUE)) return(TRUE)

  if (file.exists(Sys.which('git'))) {
    totmp <- function(x) {
      f <- tempfile(pattern = "str.")
      capture.output(str(x,
        vec.len = 1000,
        digits.d = 5,
        nchar.max = 1000), file = f)
      return(f)
    }

    return(suppressWarnings(system2(
      Sys.which('git'),
      c("diff", "--no-index", "--color-words", totmp(a), totmp(b)),
      input = "",
      stdout = TRUE, stderr = TRUE)))
  }

  return(c(
    capture.output(str(a)),
    "... does not equal...",
    capture.output(str(b))
  ))
}

```

To see the coloured output, try the following:

```
ok(cmp(1:3, 1:8))
```

1.3 Grouping tests

When dealing with many unit tests in one file it can be useful to group related unit tests. The `ok_group()` function is used like this

```

ok_group("Test addition", {
  ok(1 + 1 == 2, "Can add 1")
  ok(1 + 3 == 4, "Can add 3")
})
ok_group("Test subtraction", {
  ok(1 - 1 == 0, "Can subtract 1")
  ok(1 - 3 == -2, "Can subtract 3")
})

```

which produces the following output

```

# Test addition
ok - Can add 1
ok - Can add 3

# Test subtraction
ok - Can subtract 1
ok - Can subtract 3

```

1.4 I am sure I do not need to test my code. Is this true?

No. Sit down and have a cup of tea. Hopefully the feeling will go away.

2 Working with packages

2.1 I'm writing a package, how do I put tests in it?

Add the following line to the package DESCRIPTION file.

```
Suggests: unittest
```

Create a directory called `tests` in your package source, alongside your `R` directory. Place your tests in a file with the extension `.R` and add the following lines to the top of the file (replacing `mypackage` with the name of your package).

```
library(mypackage)
library(unnittest, quietly = TRUE)
```

That's it; R CMD check will run the tests and fail if any of the tests fail.

Any .R file in the tests directory will be run by R CMD check.

When you use the unnittest package the package "knows" that it is being run by R CMD check and at the end of the tests it produces a summary of the results. The package will also throw an error if any tests fail; throwing an error will in turn cause R CMD check to report the error and fail the check.

Here is a very simple example:

Assuming your package contains (and exports) the function biggest()

```
biggest <- function(x,y) {max(c(x,y))}
```

then the tests/my_tests_for_biggest.R file could contain something like

```
library(mypackage)
library(unnittest, quietly = TRUE)

ok(biggest(3,4) == 4, "two numbers")
ok(biggest(c(5,3),c(3,4)) == 5, "two vectors")
```

2.2 How do I test un-exported package functions?

If you have some unit tests which require access to un-exported functions, or un-exported S3 methods, you can use local.

```
local({
  ok(internal_function() == 3)
  ok(another_internal_function() == 4)
  ok(final_internal_function() == 5)
}, asNamespace('mypackage'))
```