pFUnit

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pFUnit 2 - Documentation - Version 0.0 (2013-1213-1 MLR)

1.1 Overview

pFUnit is a unit testing framework enabling JUnit-like testing of serial and MPI-parallel software written in Fortran. It makes use of modern Fortran programming techniques, including object oriented programming, offering a convenient, lightweight mechanism for Fortran developers to create and run software tests that specify the desired behavior for a given piece of code. The framework was originally created by developers from NASA and NGC TASC. The project is hosted at sourceforge/projects/pfunit.

If you are using pFUnit, please leave a note/topic at Applications of pFUnit, or send a note to Tom Clune, Ph.D., Chief, Software Systems Support Office Code 610.3, NASA Goddard Space Flight Center.

Please refer revisions and comments about the documentation to Mike Rilee, Ph.D., Rilee Systems Technologies.

1.2 Contents

- Installation
- Usage
- Development
- · Feedback & Support
- · FAQ and Tips
- Platform Specific Notes
- · Acknowledgments
- · Known Installations & Versions
- TODO
- The Preprocessor pFUnitParser
- · Revision Notes

1.3 See Also

- sourceforge/projects/pfunit
- NASA Modeling Guru
- JUnit.org

1.4 Copyright

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Installation

2.1 Installing pFUnit

Comentatry for the page.

- Prerequisites
- · Obtaining pFUnit
- · Manifest What's in the directory?
- Configuration
- Building pFUnit
 - Building pFUnit for testing serial codes (Non-MPI)
 - Building pFUnit for testing parallel codes (MPI)
 - Cleaning
 - Documentation
- Installation

2.2 Prerequisites

The development work for pFUnit has mostly been carried out on a mixture of systems, including high-end computers, Apple Mac OSX, and linux-based systems. A preliminary Windows/CYGWIN port has been contributed by a user. Full use of the system depends on the following being available.

- Fortran 2003+ (Tested with Intel 13.1+, NAG 5.3, GCC 4.8.1., IBM's XLF)
- The Message Passing Interface (MPI)
- · GNU Make
- Python

Doxygen is used to generate documentation.

The system is routinely tested with GNU, Intel, and NAG fortran compilers and OpenMPI, as well as nightly regression testing.

4 Installation

2.3 Obtaining pFUnit

The best way to obtain pFUnit is to clone the git repository from SourceForge as follows.

```
# Read Only Access
git clone git://git.code.sf.net/p/pfunit/code pFUnit
```

This will create the directory pFUnit in the current working directory.

You may also visit the project page at SourceForge and download the source tarfile "pFUnit.tar.gz" there.

http://sourceforge.net/projects/pfunit/orhttp://sourceforge.net/projects/pfunit/files/la

Extracting this tarfile via a command like

```
$ tar zxf ./pFUnit.tar.gz
```

will place the pFUnit files into the current working directory.

For other ways to acquire the code visit

https://sourceforge.net/p/pfunit/code/ci/master/tree/

or contact the pFUnit team.

2.4 Manifest - What's in the directory?

In the top level of the pFUnit distribution you will see the following files.

COPYRIGHT - Contains information pertaining to the use and distribution of pFUnit.

Examples - Contains examples of how to use pFUnit once it is installed.

GNUmakefile - The top level makefile for building and installing pFUnit.

bin - Executables used to construct and perform unit tests.

include - Files to be included into makefiles or source, including use code.

source - Source code and scripts of the pFUnit library and framework.

tests - Source code for unit testing pFUnit itself.

tools - Tools used to help develop, build, and install pFUnit.

2.5 Configuration

Little needs to be done to configure pFUnit for the build, however there are several environment variables on which the package depends.

F90_VENDOR - is set to include the correct makefile in /include, i.e. GNU, Intel, NAG, or PGI. Case insensitive file systems may cause some confusion from time-to-time.

F90 - is set to the Fortran compiler being used: e.g. ifort for Intel, gfortran for GNU.

COMPILER - is set according to F90_VENDOR and is automatically set in the top level makefile.

For MPI-based unit testing, your setup may require the following as well.

MPIF90

```
$ export MPIF90=mpif90
```

As a convenience for working with multiple MPI configurations, you may also set the following.

MPIRUN

```
$ export MPIRUN=/some.path/mpirun
```

2.6 Building pFUnit 5

2.6 Building pFUnit

2.6.1 Building pFUnit for testing serial codes (Non-MPI)

- 1. Change to the directory into which pFUnit has been placed.
- 2. Set the environment variables (in bash):

```
$ export F90=gfortran-mp-4.8
$ export F90_VENDOR=GNU
```

3. To build pFUnit for unit testing of serial codes, execute make. The unit tests for pFUnit itself will run automatically.

```
$ make tests
```

3.1 Occasionally on the first run through, one will get a spurious (runtime) error, for example in the unix process component.

```
Re-execute "make tests" to check again.
```

4. At this point the pFUnit object library is in the source directory, along with a large number of Fortran module files.

2.6.2 Building pFUnit for testing parallel codes (MPI)

To build pFUnit for unit testing MPI-based codes, be sure that the environment is properly set up for the MPI implementation you are using. Depending on your local environment, you may need execute the build within a batch or other job queing system, e.g. an interactive batch job under PBS. The steps for building pFUnit start out the same as for the serial case above, but add MPI=YES to the environment to switch on MPI support. The MPI-based unit tests for pFUnit itself will run automatically. Again, occasionally a spurious (runtime) error may appear on the first execution.

1. Execute make as follows.

```
$ make tests MPI=YES
```

2. At this point an MPI-enabled pFUnit object library is in the source directory, along with a large number of Fortran module files.

Also, one may get some harmless "no symbols" warnings when the pFUnit library is constructed.

2.6.3 Cleaning

To clean the pFUnit build directory for the space or to rebuild there are two options.

1. Make clean to remove object files and other intermediate products.

```
$ make clean
```

2. Make distclean to remove libraries and other more final products.

```
$ make distclean
```

3. Some directories support a make src_clean to remove intermediate products in subdirectories.

6 Installation

2.6.4 Documentation

A start at documentation for pFUnit is in the documentation directory. Doxygen is our primary documentation tool. To make the documentation, which will be generated in the documentation directory, please invoke the following.

```
$ make documentation
```

2.7 Installation

2.7.1 Installation - Serial

To install pFUnit for regular use, set INSTALL_DIR to the location in which to place pFUnit. This can be done on the make command line. For example, after compiling pFUnit for serial use (MPI absent or MPI=NO), please try.

```
$ # In the top of the pFUnit build directory.
$ make install INSTALL_DIR=/opt/pfunit/pfunit-serial
```

Note: you may need special priveleges to install in some locations, e.g. via sudo.

To test the installation set PFUNIT to INSTALL_DIR, then change the working directory to Examples in pFUnit distribution and execute "buildIt," which will run a number of examples. These include some expected failures.

```
$ # In the top pFUnit build directory...
$ export PFUNIT=/opt/pfunit/pfunit-serial
$ pushd Examples
$ ./buildIt
```

2.7.2 Installation - MPI

For installing an MPI-enabled pFUnit library, change to the top of the distribution and execute make with MPI=YES. You may need to "make distclean" first. After compilation and pFUnit passes its self-tests, then installation proceeds as for the serial case above.

```
$ make install INSTALL_DIR=/opt/pfunit/pfunit-parallel
```

To test, set PFUNIT and go into Examples/MPI_Halo directory.

```
$ # In the top pFUnit build directory...
$ export PFUNIT=/opt/pfunit/pfunit-parallel
$ # The variable MPIF90 must be set to the appropriate build script.
$ export MPIF90=mpif90
$ cd Examples/MPI_Halo/Semi-Automatic
$ make
```

This will compile and run a set of parallel examples that includes intentional failures.

2.7.3 Installation - DEFAULT DIRECTORY

If INSTALL_DIR is not set, "make install" will attempt to install pFUnit into the top build directory. This will create directories such as lib and mod in the top level of the build directory and will overwrite the include/base.mk with include/base-install.mk. If this is not desired, then "make develop" will put back the original base.mk, which is the file to be used for development and building pFUnit. In general, we recommend installing to a directory that is not also the build directory.

Usage

- · Usage Configuration
- · Usage Hello World
- Usage Preprocessor

3.1 Usage

3.1.1 Usage - Configuration

For regular use, after installation, the same compiler/MPI development configuration that was used to build pFUnit should be used. Once the environment variables and paths associated with the environment are set, to configure pFUnit, please set the following.

PFUNIT - set to the directory into which pFUnit was installed.

F90_VENDOR - set to Intel, GNU, NAG, or PGI accordingly.

3.1.2 Usage - Hello World

For an example of a simple usage of pFUnit, see Examples/Simple/Semi-Automatic/tests.

The simplest way to write a test is to write a preprocessor input file (extension ".pf"), which is a Fortran free format file with preprocessor directives added. An example from "helloWorld.pf" follows.

```
! from helloWorld.pf
@test
subroutine testHelloWorld()
   use pfunit_mod
   implicit none
   @assertEqual("Hello World!","Hello World!")
end subroutine testHelloWorld
```

One then instructs the preprocessor to construct a suite to execute these tests via the "testSuites.inc" file as follows.

```
! from testSuites.inc
ADD_TEST_SUITE(helloWorld_suite)
```

At this point, one can invoke the preprocessor to generate a Fortran file that when compiled and linked with pFUnit will execute the tests. For more information please see The Preprocessor - pFUnitParser or try out the examples in Example/Simple.

8 Usage

3.1.3 U	lsage -	Preprocessor	•
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Please see The Preprocessor - pFUnitParser.

Development

Generally pFUnit development is performed in the build directory structure. Care should be taken to make clean or distclean in between configuration changes. As stated in Installation, it is best to set INSTALL_DIR and "make install" pFUnit to another directory that can be placed in a user's paths.

10 Development

Feedback & Support

- Feedback
- Support

5.1 Feedback

Feedback is welcome, please use the facilities at sourceforge/projects/pfunit to share your views.

Open a ticket for bugs, features, and patch recommendations.

If you use pFUnit, please let us know by leaving a note in our Applications of pFUnit forum, or email Tom Clune, Ph.D., NASA Goddard Space Flight Center. Letting us know about your application helps us seek support for pFUnit's continued development and improvement.

5.2 Support

Please open a ticket for bugs, features, and patch recommendations. For longer term needs or considerations, please visit our discussion forums or contact Tom Clune, Ph.D., NASA Goddard Space Flight Center.

You may also find some help at FAQ and Tips.

pFUnit supports the software development of several weather and climate simulations efforts. We constantly seek to improve and correct pFUnit for our users' benefit, granting priority to the needs of our major users. Please share with us information about your application on our Applications of pFUnit forum.

FAQ and Tips

- FAQ
 - Zero Tests Run
 - Some Tests Are Not Running
- Tips
 - Environment Modules
 - Compile Time Errors
 - Intermediate files used by pFUnit

6.1 FAQ

6.1.1 Zero Tests Run

Symptom: The system under test compiles and runs fine, but reports zero tests run.

Solutions:

- There is no testSuites.inc file. Please add a testSuites.inc that lists the suites to add via ADD_TEST_SUITE(the_suite_to_add), one to a line.
- There is no <code>-DUSE_MPI</code> passed to the compiler during the build. Please add to the compiler invokation. Please see Some Tests Are Not Running.

6.1.2 Some Tests Are Not Running

Symptom: The system under test compiles and runs fine, but reports that some tests don't run.

Solutions:

• There is no <code>-DUSE_MPI</code> passed to the compiler during the build. Please add as in the following example.

```
% $PFUNIT/bin/pFUnitParser.py test_pio.pf test_pio.F90
% mpif90 -DUSE_MPI $PFUNIT/include/driver.F90 \
%    -I$PFUNIT/mod -L$PFUNIT/lib -lpfunit test_pio.F90
% mpirun -np 8 ./a.out
.
Time:    0.004 seconds
OK
```

14 FAQ and Tips

6.2 Tips

6.2.1 Environment Modules

Though not strictly required, the Environment Modules package can be a convenient way to package, maintain, and switch between environments. This can be particularly important for pFUnit, which must be built using the same tool suite being used for development, e.g. compilers, linkers, etc. [To do: A sample pFUnit modulefile is provided in the OTHER directory.]

6.2.2 Compile Time Errors

Compile time errors like '"include [...]include/.mk" not found' likely signify that you are not executing make in the top level directory during a build. Alternatively, during regular usage after installation, PFUNIT has not been set.

During building, if you wish to compile in a subdirectory within the pFUnit heriarchy, please try setting the COMPIL-ER environment variable on the make command line. For example:

```
$ make all COMPILER=Intel
```

6.2.3 Intermediate files used by pFUnit

If you wish to see the intermediate files, use the target .PRECIOUS in the makefile to keep them from being deleted. For example:

```
# In GNUmakefile .PRECIOUS: %_cpp.F90
```

Platform Specific Notes

7.1 Mac OSX

The MacPorts package management system is a convenient way to install and maintain many packages, including gcc which includes gfortran.

7.2 Windows/CYGWIN

User contributed code for Windows/CYGWIN has been added, but is currently not tested and supported by the pFUnit team. At this writing, 2013-1031, serial Examples and MPI are not known to be supported. Please contact us if you wish to either contribute or otherwise discuss this port.

Platform Spe	ecitic	notes
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Acknowledgments

Thanks to the follwing for their review and comments: B. Van Aartsen, T. Clune.

Windows/CYGWIN contributions from E. Lezar.

Other acknowledgments: S.P. Santos (NCAR), M. Hambley (UK Met).

The design of pFUnit is strongly influenced by JUnit.

Initial pFUnit 2 documentation by Michael Rilee (Rilee Systems Technologies).

18 Acknowledgments

Known Installations & Versions

TBD



TODO

- Make other directory.
- Make Environment Modules example in other directory.
- Other build systems, e.g. CMake.

22 TODO

The Preprocessor - pFUnitParser

Overview of Preprocessor (pFUnitParser.py)

- Using The Preprocessor
 - Configuration testSuites.inc
 - Invocation
 - Preprocessor Input File (.pf)
 - Directives
 - * @Parameters
 - * @TestCase
 - * @Test
 - * @MPITest

11.1 Using The Preprocessor

How to write tests using the ".pf" files. We expect this to be the main way people write pFUnit-based tests. Please see the Examples directory for a wide range of examples. The .pf files themselves are generally to be found in an example's semi-automatic/tests subdirectory.

11.1.1 Configuration - testSuites.inc

The include file "testSuites.inc" tells the preprocessor to generate code for TestSuites listed therein. The suite names are based on the TestCases provided in the preprocessor input file or the name of the preprocessor input file (.pf) itself. For example, if no module is defined in a .pf file, i.e. the preprocessor will define the module, one can set up a "testSuites.inc" as follows.

```
! To load "exampleTestsNoModule.pf".
ADD_TEST_SUITE(exampleTestsNoModule_suite)
```

For a .pf file that contains a module associated with a test suite the syntax is as follows.

```
! To load "exampleTests.pf" implementing the module exampleTests_mod. 
 {\tt ADD\_TEST\_SUITE} \ (exampleTests\_mod\_suite)
```

11.1.2 Invocation

To run the preprocessor on on a preprocessor input file "exampleTests.pf", invoke:

```
$ ${PFUNIT}/bin/pFUnitParser.py exampleTests.pf exampleTests.F90
```

A convenient GNUmakefile rule is as follows.

```
%.F90: %.pf
$(PFUNIT)/bin/pFUnitParser.py $< $@</pre>
```

11.1.3 Preprocessor Input File (.pf)

The preprocessor input file is a Fortran free format file that contains subroutines, including those implementing the suite of tests, or a module with the tests, TestCases, and support for parameters. The preprocessor reads and parses this file producing a fortran file implementing the tests, automating some boilerplate code. Embedded "@" directives inform the preprocessor about information needed to generate the test suite. If the .pf file does not implement a module providing a test suite, the preprocessor will use the name of .pf file referred to by "test-Suites.inc". Currently only one test suite per .pf file is allowed, a limitation of the current implementation of the parser.

Many example .pf files may be found in the examples' semi-automatic/tests subdirectories in the Examples directory.

11.1.4 Directives

Preprocessor "@" directives instruct the preprocessor how to interpret parts of the code relevant to the generation of the test suite. The most important directives follow.

11.1.4.1 @Parameters

The directive indicates the declaration of the parameterized type used to generate the iteration over the multiple parameter values. It also identifies the names of the parameters to be iterated over. The preprocessor extracts type information from the declaration of the parameter type collection that immediately follows the directive. This directive will set up the iteration. To define the parameter values per iteration the getParameters method of the abstract ParameterizedTest must be implemented. For example:

```
@Parameters = [p1,p2]
type, extends(AbstractTestParameter) :: exampleCase
   integer :: i
    real :: x
end type exampleCase
```

11.1.4.2 @TestCase

This directive identifies to the preprocessor the TestCase declaration. The type declared at this point extends TestCase (or its extension), which includes setting methods such as the following: setUp, tearDown, runMethod, userMethod. For the extension MPITestCase, as with ParameterizedTestCase, you have the option (requirement if parameters are used) to set getParameters and getParameterString. For example:

```
@TestCase
type, extends(MPITestCase) :: Test_Parameters
  integer :: p1, p2
  procedure(runMethod), pointer :: userMethod => null()
contains
  procedure, nopass :: getParameters
  procedure :: getParameterString => getParameterString_
  procedure :: runMethod
end type Test_Parameters
```

11.1.4.3 @Test

This directive is used to indicate a test routine to the preprocessor, which then includes it in the test suite. There may be multiple tests in the .pf file, each annotated by the directive. For example, from Examples/Fixture:

```
@Test
   subroutine testBracketInterior(this)
      class (Test_LinearInterpolator), intent(inout) :: this
     @assertEqual([3,4], this%interpolator%getBracket(at=4.))
end subroutine testBracketInterior

@Test
   subroutine testInterpolateAtNode(this)
     class (Test_LinearInterpolator), intent(inout) :: this
     @assertEqual(2., this%interpolator%interpolate(at=3.))
end subroutine testInterpolateAtNode
```

11.1.4.4 @MPITest

This directive indicates an MPI parallel test to the preprocessor, which then includes it in an MPI enabled test suite. The directive takes a single argument, the requested number of MPI processes to run. The syntax, exemplified by one of the tests from Examples/MPI_Halo:

```
@mpiTest( npes=[1,2,3])
subroutine testHaloInterior(this)
   use Halo_mod
   use pfunit_mod
   implicit none
   class (MpiTestMethod) :: this
   integer, parameter :: N = 2
   real :: a(N, 0:N+1)
   integer :: p
   p = this%getProcessRank()
   a(:,1:N) = p

a(:,0) = -1
   a(:,N+1) = -1
   call haloFill(a, this%getMpiCommunicator())
   @assertEqual(real(p), a(1,1))
   @assertEqual(real(p), a(2,1))
   @assertEqual(real(p), a(1,2))
   @assertEqual(real(p), a(2,2))
end subroutine testHaloInterior
```

Chapter 12

Revision Notes

- 2013-1212. Initial draft of Doxygen version. MLR
- 2013-1107. Minor edits. MLR
- 2013-1031. Added user contributed code for Windows/CYGWIN & IBM's XLF. MLR
- 2013-0830-1359. Minor corrections and added MPIF90 to 6.2. MLR
- 2013-0806-1345. Corrected git reference. Was using old URL. MLR
- 2013-0805. Initial draft. MLR

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Chapter 13

Data Type Index

13.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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Chapter 14

Data Type Index

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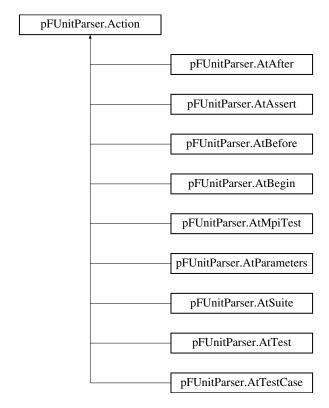
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Chapter 15

Data Type Documentation

15.1 pFUnitParser.Action Class Reference

Inheritance diagram for pFUnitParser.Action:



Public Member Functions

def apply

The documentation for this class was generated from the following file:

pFUnitParser.py

15.2 add_mod Module Reference

Public Member Functions

- real function add (x, y)
- real function add (x, y)
- real function add (x, y)

The documentation for this module was generated from the following files:

- · Robust/Semi-Automatic/src/add.F90
- · Simple/Semi-Automatic/src/add.F90
- Simple_Windows/Semi-Automatic/src/add.F90

15.3 addcomplex_mod Module Reference

Public Member Functions

- complex function, dimension(size(z0)) add (z0, z1)
- complex function, dimension(size(z0)) add (z0, z1)

The documentation for this module was generated from the following files:

- · Semi-Automatic/src/addComplex.F90
- Windows/Semi-Automatic/src/addComplex.F90

15.4 CodeUtilities.ArrayDescription Class Reference

Public Member Functions

- def __init__
- def NAME
- def DECLARE
- def DECLARESCALAR
- def KIND
- def RANK
- def FTYPE
- def EXPANDSHAPE
- def FailureMessageFork

Public Attributes

- fType
- kind
- · rank

The documentation for this class was generated from the following file:

· CodeUtilities.py

15.5 assert_mod Module Reference

15.5.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

Assert.F90

15.6 assertbasic_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine assertexceptionraisedmessage (message)
- subroutine, public assertsameshape (shapeA, shapeB, message, location)
- logical function, public conformable (shapeA, shapeB)
- logical function, public nonconformable (shapeA, shapeB)
- subroutine, public **assertany** (conditions, message, location)
- subroutine, public **assertall** (conditions, message, location)
- subroutine, public **assertnone** (conditions, message, location)
- subroutine, public assertnotall (conditions, message, location)
- subroutine assertisnan_double (x, message, location)
- subroutine **assertisfinite_single** (x, message, location)
- subroutine **assertisfinite_double** (x, message, location)

15.6.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· AssertBasic.F90

15.7 assertinteger_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine assertequalinteger1d1d_ (expected, found, message, location)
- subroutine assertequalinteger0d1d_ (expected, found, message, location)
- subroutine assertequalinteger2d2d_ (expected, found, message, location)
- subroutine assertequalinteger0d2d_ (expected, found, message, location)
- subroutine assertlessthan_ (a, b, message, location)

15.7.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· AssertInteger.F90

15.8 GenerateRealArrayNewSignature.AssertRealArrayArgument Class Reference

Public Member Functions

- def __init__
- · def updateDescriptions
- def getExpectedDescription
- def getFoundDescription
- · def getTolerance

Public Attributes

- expectedFType
- · expectedPrecision
- expectedRank
- foundFType
- foundPrecision
- foundRank
- tolerance
- · expectedDescription

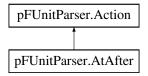
foundDescription

The documentation for this class was generated from the following file:

· GenerateRealArrayNewSignature.py

15.9 pFUnitParser.AtAfter Class Reference

Inheritance diagram for pFUnitParser.AtAfter:



Public Member Functions

- def __init__
- · def match
- · def action

Public Attributes

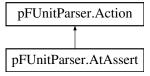
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.10 pFUnitParser.AtAssert Class Reference

Inheritance diagram for pFUnitParser.AtAssert:



- def __init__
- def match
- def appendSourceLocation
- · def action

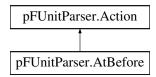
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.11 pFUnitParser.AtBefore Class Reference

Inheritance diagram for pFUnitParser.AtBefore:



Public Member Functions

- def __init__
- def match
- · def action

Public Attributes

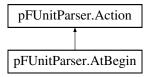
parser

The documentation for this class was generated from the following file:

· pFUnitParser.py

15.12 pFUnitParser.AtBegin Class Reference

Inheritance diagram for pFUnitParser.AtBegin:



- def __init__
- · def match
- · def action

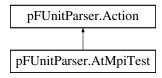
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.13 pFUnitParser.AtMpiTest Class Reference

Inheritance diagram for pFUnitParser.AtMpiTest:



Public Member Functions

- def __init__
- def match
- · def action

Public Attributes

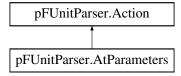
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.14 pFUnitParser.AtParameters Class Reference

Inheritance diagram for pFUnitParser.AtParameters:



- def __init__
- · def match
- · def action

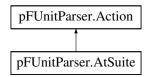
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.15 pFUnitParser.AtSuite Class Reference

Inheritance diagram for pFUnitParser.AtSuite:



Public Member Functions

- def __init__
- def match
- · def action

Public Attributes

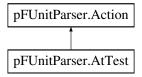
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.16 pFUnitParser.AtTest Class Reference

Inheritance diagram for pFUnitParser.AtTest:



- def __init__
- def match
- · def action

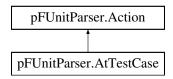
parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.17 pFUnitParser.AtTestCase Class Reference

Inheritance diagram for pFUnitParser.AtTestCase:



Public Member Functions

- def __init__
- def match
- · def action

Public Attributes

parser

The documentation for this class was generated from the following file:

pFUnitParser.py

15.18 basetestrunner_mod Module Reference

<BriefDescription>

15.18.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• BaseTestRunner.F90

15.19 beforeafter mod Module Reference

Public Member Functions

- subroutine first (this)
- subroutine last (this)
- subroutine succeeds (this)
- subroutine fails (this)

Public Attributes

- integer countstart = 0
- integer countcomplete = 0

The documentation for this module was generated from the following file:

· beforeAfter.pf

15.20 brokensetupcase_mod Module Reference

Public Member Functions

 type(brokensetupcase) function, pointer, public newbrokensetupcase ()

The documentation for this module was generated from the following file:

• BrokenSetUpCase.F90

15.21 brokentestcase_mod Module Reference

Public Member Functions

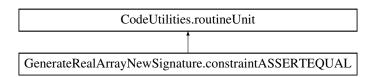
• subroutine teardown (this)

The documentation for this module was generated from the following file:

· BrokenTestCase.F90

15.22 GenerateRealArrayNewSignature.constraintASSERTEQUAL Class Reference

Inheritance diagram for GenerateRealArrayNewSignature.constraintASSERTEQUAL:



Public Member Functions

def __init__

This next line actually generates the text of the code.

Public Attributes

- expectedDescr
- foundDescr
- name
- name1

Add in the extra module procedures...

tolerance

If you need another kind of code generator, perhaps conditioned on eDesc., fDesc., or tol, then that logic would go here...

15.22.1 Constructor & Destructor Documentation

15.22.1.1 def GenerateRealArrayNewSignature.constraintASSERTEQUAL.__init__ (self, expectedDescr, foundDescr, tolerance)

This next line actually generates the text of the code.

15.22.2 Member Data Documentation

15.22.2.1 GenerateRealArrayNewSignature.constraintASSERTEQUAL.name1

Add in the extra module procedures...

If needed... Kluge. Need to make makeSubroutineNames and load the extra interface entries there.

$15.22.2.2. \\ Generate Real Array New Signature. constraint ASSERTEQUAL. tolerance$

If you need another kind of code generator, perhaps conditioned on eDesc., fDesc., or tol, then that logic would go here...

E.g. to implement assertEqual(Logical(...))

The documentation for this class was generated from the following file:

· GenerateRealArrayNewSignature.py

15.23 mods.pre.pre2.dataString Class Reference

- def __init__
- def insert
- def getLength
- def getPosition
- def setPosition
- def getItem
- def getDataAtPosition

- · def getData
- def getSlice
- def getSliceForward
- · def removeSlice
- · def getCurrentData
- def insertAtCurrent
- · def append
- def advanceAndGetNextData
- · def validPosition
- def findToEnd
- · def match
- def matchToEnd
- · def searchToEnd
- def searchToPosition
- · def finditerToEnd
- def finditerToPosition

- · data
- position

The documentation for this class was generated from the following file:

· pre2.py

15.24 debuglistener_mod Module Reference

<BriefDescription>

Public Member Functions

• subroutine starttest (this, testName)

15.24.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· DebugListener.F90

15.25 CodeUtilities.declaration Class Reference

Public Member Functions

- def __init__
- · def generate

Public Attributes

- simpleDeclaration
- fullDeclaration
- name

The documentation for this class was generated from the following file:

· CodeUtilities.py

15.26 dynamictestcase_mod Module Reference

<BriefDescription>

Public Member Functions

 type(dynamictestcase) function, pointer, public newdynamictestcase (testMethod, name)

15.26.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• DynamicTestCase.F90

15.27 exception_mod Module Reference

Public Member Functions

• subroutine, public initializeglobalexceptionlist ()

- type(exception) function, public catchany (preserve)
- type(exception) function, dimension(:), allocatable, public getexceptions ()
- logical function, public noexceptions ()
- logical function, public anyerrors ()
- subroutine, public gatherexceptions (context)
- subroutine, public clearall ()

The documentation for this module was generated from the following file:

· Exception.F90

15.28 fixture_mod Module Reference

Public Member Functions

- subroutine mysetup ()
- subroutine myteardown ()
- subroutine testread ()
- subroutine testeof ()
- subroutine mysetup ()
- subroutine myteardown ()
- subroutine testread ()
- subroutine testeof ()

The documentation for this module was generated from the following files:

- · Semi-Automatic/tests/fixtureTests.pf
- Windows/Semi-Automatic/tests/fixtureTests.pf

15.29 fixturetestcase mod Module Reference

Public Member Functions

- type(fixturetestcase) function, public newfixturetestcase ()
- subroutine, public simpletestmethod (this)
- subroutine, public methoda (this)
- subroutine, public methodb (this)

The documentation for this module was generated from the following file:

• FixtureTestCase.F90

15.30 CodeUtilities.fortranSubroutineSignature Class Reference

- def __init__
- def setReturnFType

- · def addArg
- def generateInterfaceEntry
- def generateImplementationSignature
- def generateImplementationClose

- name
- ArgumentToFType
- ReturnFType
- SubroutineType

The documentation for this class was generated from the following file:

· CodeUtilities.py

15.31 halo_mod Module Reference

Public Member Functions

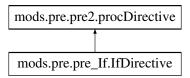
· subroutine halofill (array, communicator)

The documentation for this module was generated from the following file:

· Halo.F90

15.32 mods.pre.pre_lf.lfDirective Class Reference

Inheritance diagram for mods.pre.pre_If.IfDirective:



Public Member Functions

• def evaluate

Public Attributes

- startPosition
- newPosition

The documentation for this class was generated from the following file:

pre_lf.py

15.33 CodeUtilities.implementation Class Reference

Public Member Functions

- def __init__
- · def generate

Public Attributes

- name
- source

The documentation for this class was generated from the following file:

· CodeUtilities.py

15.34 CodeUtilities.interfaceBlock Class Reference

The documentation for this class was generated from the following file:

· CodeUtilities.py

15.35 mods.pre.pre_lf.interval Class Reference

Public Member Functions

- def __init__
- · def getInterval
- def setInterval
- def getStart
- def getEnd

Public Attributes

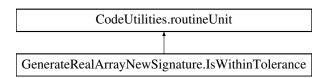
- start
- end
- interval

The documentation for this class was generated from the following file:

• pre_lf.py

15.36 GenerateRealArrayNewSignature.lsWithinTolerance Class Reference

Inheritance diagram for GenerateRealArrayNewSignature.lsWithinTolerance:



Public Member Functions

• def __init__

Public Attributes

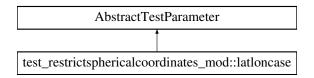
- rank
- · precision
- name
- fType
- · declaration
- · declarations

The documentation for this class was generated from the following file:

GenerateRealArrayNewSignature.py

15.37 test_restrictsphericalcoordinates_mod::latloncase Type Reference

Inheritance diagram for test_restrictsphericalcoordinates_mod::latloncase:



Public Attributes

- real lat
- · real lon
- · real restrictedlat
- · real restrictedIon

The documentation for this type was generated from the following file:

· Test_RestrictedSphericalCoordinates.pf

15.38 linearinterpolator_mod Module Reference

The documentation for this module was generated from the following file:

· LinearInterpolator.F90

15.39 makeinfinity_mod Module Reference

Public Member Functions

- real(r32) function, public makeinf_32 ()
- real(r64) function, public makeinf_64 ()

15.39.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

· MakeInfinity.F90

15.40 makenan_mod Module Reference

```
<BriefDescription>
```

Public Member Functions

- real(r32) function, public makenan_32 ()
- real(r64) function, public makenan 64 ()

15.40.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

· MakeNaN.F90

15.41 mockcall_mod Module Reference

<BriefDescription>

Public Member Functions

• type(mockcall) function, public newmockcall (name)

15.41.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· MockCall.F90

15.42 mocklistener_mod Module Reference

Public Member Functions

• subroutine starttest (this, testName)

The documentation for this module was generated from the following file:

· MockListener.F90

15.43 testParser.MockParser Class Reference

Public Member Functions

- def __init__
- def nextLine

Public Attributes

- line
- outputFile
- outLines
- tests

· mpitests

The documentation for this class was generated from the following file:

· testParser.py

15.44 mockrepository_mod Module Reference

```
<BriefDescription>
```

Public Member Functions

- type(mockrepository) function, pointer, public **newmockrepository** ()
- subroutine expectcall (this, obj, method)

15.44.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· MockRepository.F90

15.45 mocksut_mod Module Reference

Public Member Functions

- type(mocksut) function, allocatable, public newmocksut (repository)
- subroutine method1 (this)

The documentation for this module was generated from the following file:

• Test_MockRepository.F90

15.46 testParser.MockWriter Class Reference

- def __init__
- def write

parser

The documentation for this class was generated from the following file:

testParser.py

15.47 CodeUtilities.module Class Reference

Public Member Functions

- def __init__
- · def generate
- def addDeclaration
- def addImplementation
- def addRoutineUnit
- def addInterfaceBlock
- · def getName
- def setFileName
- def getFileName

Public Attributes

- name
- · declarations
- implementations
- · generation
- fileName

The documentation for this class was generated from the following file:

CodeUtilities.py

15.48 mpicontext_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine barrier (this)
- integer function getmpicommunicator (this)

15.48.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

MpiContext.F90

15.49 mpistubs_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine, public mpi_comm_rank (comm, rank, ier)
- subroutine, public mpi_comm_size (comm, size, ier)
- subroutine, public mpi_comm_dup (comm, newComm, ier)
- subroutine, public **mpi_comm_group** (comm, group, ier)
- subroutine, public mpi_group_range_incl (group, n, ranges, newGroups, ier)
- subroutine, public mpi_comm_create (comm, group, newComm, ier)

Public Attributes

- integer, parameter, public mpi_comm_world = -1
- integer, parameter, public mpi_comm_null = -1
- integer, parameter, public mpi_comm_success = 0

15.49.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· MpiStubs.F90

15.50 mpitestcase_mod Module Reference

Public Member Functions

- recursive subroutine runbare (this)
- subroutine setup (this)

15.50.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

· MpiTestCase.F90

15.51 mpitestmethod_mod Module Reference

<BriefDescription>

15.51.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

• MpiTestMethod.F90

15.52 parallelcontext_mod Module Reference

15.52.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· ParallelContext.F90

15.53 parallelexception_mod Module Reference

<BriefDescription>

Public Member Functions

• subroutine, public gather (context)

15.53.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· ParallelException.F90

15.54 parameterizedtestcase_mod Module Reference

• integer, parameter, public max_len_label = 32

15.54.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

ParameterizedTestCase.F90

15.55 params_mod Module Reference

<BriefDescription>

Public Attributes

- integer, parameter **r32** = selected_real_kind(p=6)
- integer, parameter r64 = selected_real_kind(p=14)
- integer, parameter **c32** = selected real kind(p=6)
- integer, parameter c64 = selected_real_kind(p=14)
- integer, parameter **neqp** =0
- integer, parameter eqp =1
- integer, parameter gtp =2
- integer, parameter **gep** =3
- integer, parameter **Itp** =4
- integer, parameter **lep** =5
- integer, parameter **releqp** =6

15.55.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• Params.F90

15.56 pFUnitParser.Parser Class Reference

Public Member Functions

- def __init__
- def run
- · def nextLine
- · def makeSuite
- def final

Public Attributes

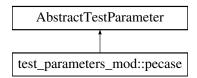
- inputFile
- outputFile
- moduleName
- suiteName
- testCase
- setUp
- tearDown
- · defaultName
- fileName
- lineNumber
- parameters
- parameterType
- · tests
- mpitests
- actions

The documentation for this class was generated from the following file:

pFUnitParser.py

15.57 test_parameters_mod::pecase Type Reference

Inheritance diagram for test_parameters_mod::pecase:



Public Attributes

- integer p1
- integer p2

The documentation for this type was generated from the following file:

· parameterizedTests.pf

15.58 pfunit Module Reference

<BriefDescription>

15.58.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• pFUnitPackage.F90

15.59 pfunit_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine, public initialize (useMpi)
- subroutine, public finalize ()

15.59.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

• pFUnit.F90

15.60 privateexception_mod Module Reference

<BriefDescription>

Public Member Functions

- type(exceptionlist) function, public newexceptionlist ()
- logical function noexceptions (this)

Public Attributes

- integer, parameter, public **maxlen_message** = 80*15
- integer, parameter, public maxlen_file_name = 80
- character(len=*), parameter, public null_message = "

15.60.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

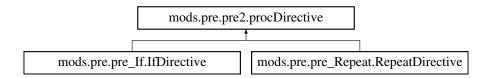
```
<A note here.> <Or starting here...>
```

The documentation for this module was generated from the following file:

· Exception.F90

15.61 mods.pre.pre2.procDirective Class Reference

Inheritance diagram for mods.pre.pre2.procDirective:



Public Member Functions

- def __init__
- · def getLength
- · def match
- def evaluate
- def getNewPosition
- def addTokenRE
- def searchTokenToEnd
- def searchTokenToPosition
- def finditerTokenToPosition
- def makeTokenErrorMessage

Public Attributes

- name
- newPosition
- · tokens
- TokenREs

15.61.1 Member Function Documentation

15.61.1.1 def mods.pre.pre2.procDirective.addTokenRE (self, args, key, defaultToken, prefix = r''' (?i) [t = r''', postfix = ")

Add a token/create an RE with a prefix that by default ignores preceding whitespace. Stores the RE in a dictionary for this directive.

The documentation for this class was generated from the following file:

• pre2.py

15.62 remoteproxytestcase_mod Module Reference

<BriefDescription>

15.62.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

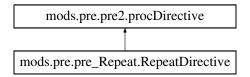
```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

• RemoteProxyTestCase.F90

15.63 mods.pre.pre_Repeat.RepeatDirective Class Reference

Inheritance diagram for mods.pre.pre_Repeat.RepeatDirective:



Public Member Functions

• def evaluate

Public Attributes

- startPosition
- newPosition

The documentation for this class was generated from the following file:

· pre Repeat.py

15.64 resultprinter_mod Module Reference

<BriefDescription>

Public Member Functions

- type(resultprinter) function, public newresultprinter (unit)
- subroutine adderror (this, testName, exceptions)
- subroutine **starttest** (this, testName)
- subroutine **printheader** (this, runTime)

15.64.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· ResultPrinter.F90

15.65 robustrunner_mod Module Reference

<BriefDescription>

Public Member Functions

- type(robustrunner) function newrobustrunner_unit (remoteRunCommand, unit)
- subroutine runwithresult (this, aTest, context, result)
- subroutine launchremoterunner (this, numSkip)
- subroutine starttest (this, testName)
- subroutine adderror (this, testName, exceptions)
- type(testresult) function createtestresult (this)

15.65.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· RobustRunner.F90

15.66 robusttestsuite_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testrunsucceeds ()
- subroutine testrunstops ()

The documentation for this module was generated from the following file:

robustTestSuite.F90

15.67 CodeUtilities.routineUnit Class Reference

Inheritance diagram for CodeUtilities.routineUnit:



Public Member Functions

- def __init__
- def setName
- · def getName
- def setDeclaration
- · def addDeclaration
- def setImplementation
- · def getDeclaration
- def getDeclarations
- def getImplementation
- def clearDeclarations

Public Attributes

- name
- · declaration
- declarations
- implementation

The documentation for this class was generated from the following file:

CodeUtilities.py

15.68 serialcontext_mod Module Reference

<BriefDescription>

Public Member Functions

 type(serialcontext) function, public newserialcontext ()

Public Attributes

type(serialcontext), parameter,
 public the_serial_context = SerialContext(1)

15.68.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· SerialContext.F90

15.69 simpletestcase_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- type(simpletestcase) function, public **newsimpletestcase** (name, userMethod)
- subroutine, public method1 (this)
- subroutine, public method2 (this)
- subroutine, public methodwith2exceptions (this)
- subroutine delete_ (this)

The documentation for this module was generated from the following file:

• SimpleTestCase.F90

15.70 sourcelocation mod Module Reference

<BriefDescription>

Public Attributes

- character(len=maxlen_file_name),
 parameter, public unknown_file_name = '<unknown file>'
- integer, parameter, public unknown_line_number = -1
- type(sourcelocation),
 parameter, public unknown_source_location = SourceLocation()

15.70.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

SourceLocation.F90

15.71 sphericalcoordinates_mod Module Reference

The documentation for this module was generated from the following file:

· SphericalCoordinates.F90

15.72 testlistener_mod::startTest Interface Reference

The documentation for this interface was generated from the following file:

• TestListener.F90

15.73 stringconversionutilities_mod Module Reference

<BriefDescription>

Public Member Functions

- character(len=len_trim(a)+1+len_trim(b))
 function, public appendwithspace (a, b)
- character(len=:) function, allocatable, public nullterminate (string)
- character(len=:) function, allocatable, public unlessscalar (vShape, string)

Public Attributes

• integer, parameter, public maxlen_string = 80

15.73.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• StringConversionUtilities.F90

15.74 subsetrunner_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine addfailure (this, testName, exceptions)
- subroutine starttest (this, testName)

15.74.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> <Or starting here...>

The documentation for this module was generated from the following file:

· SubsetRunner.F90

15.75 surrogatetestcase_mod Module Reference

<BriefDescription>

15.75.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• SurrogateTestCase.F90

15.76 sut_mod Module Reference

The documentation for this module was generated from the following file:

· Test MockRepository.F90

15.77 test_assert_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testassertequalstringdiffer1st ()

The documentation for this module was generated from the following file:

· Test Assert.F90

15.78 test_assertbasic_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testasserttruef ()
- subroutine testassertisfinite ()

The documentation for this module was generated from the following file:

Test_AssertBasic.F90

15.79 test_assertcomplex_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testequals_c_complexscalar ()
- subroutine testequals c 0d1d ()
- subroutine testequals_c_1d_nonconformable1 ()
- subroutine testequals_c_2d_singleelementdifferent ()
- subroutine testequals_c_multid_singleelementdifferent ()
- · subroutine testequals c multid singleelementdifferent1
- subroutine testequals_c_multid_singleelementdifferent2
- subroutine testequals c multid singleelementdifferent3
- · subroutine testeguals c multid singleelementdifferent4
- subroutine testequals_c_multid_singleelementdifferent5
- subroutine testequals c multidmultiprec singleeltdiff ()
- subroutine testequals_c_multidmultiprec_singleeltdiff1 ()
- subroutine testequals_c_multidmultiprec_singleeltdiff2 ()
- subroutine testequals c multidmultiprec singleeltdiff3 ()
- subroutine testequals c multidmultiprec singleeltdiff4 ()
- subroutine testequals c multidmultiprec singleeltdiff5 ()
- subroutine testequals c multidmultiprec singleeltdiff6 ()
- subroutine testequals c multidmultiprec singleeltdiff7 ()
- subroutine testequals_c_multidmultiprec_singleeltdiff8 ()
- subroutine testequals scalarwithtolerance ()
- subroutine testequals_c_multidwithtolerance ()
- subroutine testequals c multidwithtolerance1 ()
- subroutine testequals c multidwithtolerance64 ()
- subroutine testequals c multidwithtolerance64 1 ()
- subroutine testequals_c_multidwithtolerance64_2 ()
- subroutine testequals_c_multidsourcelocation ()
- subroutine testequals 4dpcomplex differencereport ()
- subroutine assertcatch (string, location)

The documentation for this module was generated from the following file:

• Test AssertComplex.F90

15.80 test_assertinteger_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testassertequal_equal ()

The documentation for this module was generated from the following file:

• Test_AssertInteger.F90

15.81 test assertreal mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testequals 0d1d ()
- subroutine testequals_1d_nonconformable1 ()
- subroutine testequals_2d_singleelementdifferent ()
- subroutine testequals_multid_singleelementdifferent ()
- · subroutine testequals multid singleelementdifferent1
- subroutine testequals multid singleelementdifferent2
- subroutine testequals multid singleelementdifferent3
- subroutine testequals multid singleelementdifferent4
- · subroutine testequals multid singleelementdifferent5
- subroutine testequals_multidmultiprec_singleeltdiff ()
- subroutine testequals_multidmultiprec_singleeltdiff1 ()
- subroutine testequals_multidmultiprec_singleeltdiff2 ()
- subroutine testequals_multidmultiprec_singleeltdiff3 ()
- subroutine testequals_multidmultiprec_singleeltdiff4 ()
- subroutine testequals_multidmultiprec_singleeltdiff5 ()
- subroutine testequals multidmultiprec singleeltdiff6 ()
- subroutine testequals multidmultiprec singleeltdiff7 ()
- subroutine testequals multidmultiprec singleeltdiff8 ()
- subroutine testequals scalarwithtolerance ()
- subroutine testequals scalarwithtolerancenomsg ()
- subroutine testequals_vectorwithtolerancenomsg ()
- subroutine testequals multidwithtolerance ()
- subroutine testequals_multidwithtolerance1 ()
- subroutine testequals multidwithtolerance64 ()
- subroutine testeguals multidwithtolerance64 1 ()
- subroutine testequals_multidwithtolerance64_2 ()
- subroutine testequals_multidsourcelocation ()
- subroutine testequals_scalarandlocation ()
- subroutine testequals_scalarinfinity_equal ()
- subroutine testequals_scalarinfinity_unequal_a ()
- subroutine testequals_scalarinfinity_unequal_b ()
- subroutine testequals scalarinfinity unequal c ()
- · subroutine assertcatch (string, location)

The documentation for this module was generated from the following file:

Test AssertReal.F90

15.82 test_exception_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testgetnumexceptions ()
- subroutine testcatchsucceed ()
- subroutine testgetlinenumber ()
- subroutine testgetfilename ()

The documentation for this module was generated from the following file:

• Test_Exception.F90

15.83 test_fixturetestcase_mod Module Reference

Public Member Functions

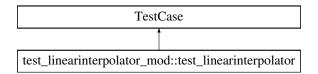
- type(testsuite) function, public suite ()
- subroutine testrunwithfixture ()
- subroutine testbrokentestcase ()
- subroutine testbrokensetupcase ()

The documentation for this module was generated from the following file:

• Test_FixtureTestCase.F90

15.84 test_linearinterpolator_mod::test_linearinterpolator Type Reference

Inheritance diagram for test_linearinterpolator_mod::test_linearinterpolator:



Public Member Functions

- type(test_linearinterpolator)
 function newtest linearinterpolator (name, userMethod)
- procedure setup
- · procedure teardown
- procedure runmethod

Public Attributes

- type(linearinterpolator) interpolator
- procedure(runmethod), pointer usermethod => null()

The documentation for this type was generated from the following file:

· Test LinearInterpolator.pf

15.85 test_linearinterpolator_mod Module Reference

Data Types

· type test_linearinterpolator

Public Member Functions

- type(test_linearinterpolator)
 function newtest_linearinterpolator (name, userMethod)
- subroutine setup (this)
- subroutine teardown (this)
- · subroutine runmethod (this)
- subroutine testbracketatnode (this)
- · subroutine testbracketinterior (this)
- subroutine testinterpolateatnode (this)
- subroutine testinterpolateconstant (this)

The documentation for this module was generated from the following file:

· Test_LinearInterpolator.pf

15.86 test_mockcall_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testexpectoneintegerargument
- subroutine testfailexpectoneintegerargument

The documentation for this module was generated from the following file:

Test_MockCall.F90

15.87 test_mockrepository_mod Module Reference

Public Member Functions

- type(testsuite) function, public **suite** ()
- subroutine testnoaction ()

The documentation for this module was generated from the following file:

· Test MockRepository.F90

15.88 test_mod Module Reference

<BriefDescription>

15.88.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• Test.F90

15.89 test_mpicontext_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testnumprocesses1 (context)

The documentation for this module was generated from the following file:

• Test_MpiContext.F90

15.90 test_mpiexception_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine test_anyexceptions_none (this)
- subroutine test getnumexceptions (this)
- · subroutine test_gather (this)

The documentation for this module was generated from the following file:

• Test_MpiException.F90

15.91 test mpitestcase mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- type(test mpitestcase)

function, public newtest mpitestcase (name, userMethod, numProcesses)

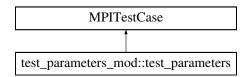
- subroutine testrunon2processors (this)
- subroutine brokenprocess1 (this)
- subroutine brokenonprocess2 (this)
- subroutine testfailon1 (this)
- subroutine testfailon2 (this)
- subroutine **testtoofewprocs** (this)
- · recursive subroutine runmethod (this)

The documentation for this module was generated from the following file:

• Test_MpiTestCase.F90

15.92 test_parameters_mod::test_parameters Interface Reference

Inheritance diagram for test_parameters_mod::test_parameters:



Public Member Functions

- procedure, nopass getparameters
- procedure **getparameterstring** => getParameterString_
- · procedure runmethod
- type(test_parameters) function newtest (name, method, npe, p1, p2)

Public Attributes

- integer p1
- integer p2
- procedure(runmethod), pointer **usermethod** => null()

The documentation for this interface was generated from the following file:

· parameterizedTests.pf

15.93 test_parameters_mod Module Reference

Data Types

- type pecase
- interface test_parameters

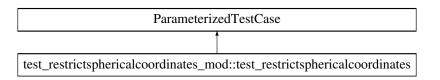
Public Member Functions

- type(test_parameters) function **newtest** (name, method, npe, p1, p2)
- type(pecase) function, dimension(:), allocatable getparameters ()
- character(:) function, allocatable getparameterstring_ (this)
- subroutine runmethod (this)
- subroutine, public testparambroken (this)

The documentation for this module was generated from the following file:

· parameterizedTests.pf

 $Inheritance\ diagram\ for\ test_restricts pherical coordinates_mod:: test_restricts pherical coordinates:$



Public Member Functions

- procedure, nopass getparameters
- · procedure getparameterstring
- · procedure runmethod
- type(test_restrictsphericalcoordinates)
 function newtest (name, method, lat, lon, restrictedLat, restrictedLon)

Public Attributes

- real lat
- real lon
- · real restrictedlat
- · real restrictedIon
- · type(sphericalcoordinates) unrestricted
- type(sphericalcoordinates) restricted
- procedure(runmethod), pointer **usermethod** => null()

The documentation for this interface was generated from the following file:

• Test_RestrictedSphericalCoordinates.pf

15.95 test_restrictsphericalcoordinates_mod Module Reference

Data Types

- · type latloncase
- interface test restrictsphericalcoordinates

Public Member Functions

- type(test_restrictsphericalcoordinates)
 function newtest (name, method, lat, lon, restrictedLat, restrictedLon)
- type(latloncase) function, dimension(:), allocatable getparameters ()
- subroutine testrestrict (this)
- · character(:) function, allocatable getparameterstring (this)
- subroutine runmethod (this)

The documentation for this module was generated from the following file:

Test RestrictedSphericalCoordinates.pf

15.96 test_robustrunner_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testrunvariety ()

The documentation for this module was generated from the following file:

• Test RobustRunner.F90

15.97 test_simpletestcase_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- type(testsuite) function internalsuite ()
- subroutine testworks ()
- subroutine testfails ()
- subroutine testrunsuite ()

The documentation for this module was generated from the following file:

• Test SimpleTestCase.F90

15.98 test_stringconversionutilities_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testtostringinteger1d ()

The documentation for this module was generated from the following file:

• Test_StringConversionUtilities.F90

15.99 test_testmethod_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testmethodwasrun ()
- subroutine testwasrun ()

The documentation for this module was generated from the following file:

• Test_TestMethod.F90

15.100 test testresult mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testgetnumrun ()
- subroutine testgetnumfailed ()
- subroutine testaddlistenerend ()
- subroutine testaddlistenerstart ()
- subroutine testaddlistenerfailure ()

The documentation for this module was generated from the following file:

· Test TestResult.F90

15.101 test_testsuite_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testcounttestcases ()
- subroutine testcounttestcasesnesteda ()
- subroutine testcounttestcasesnestedb ()
- subroutine testcounttestcasesnestedc ()
- subroutine testgettestcases ()
- subroutine mytestmethod ()

The documentation for this module was generated from the following file:

• Test_TestSuite.F90

15.102 test_unixprocess_mod Module Reference

Public Member Functions

- type(testsuite) function, public suite ()
- subroutine testisactive ()

The documentation for this module was generated from the following file:

• Test_UnixProcess.F90

15.103 testcase_mod Module Reference

<BriefDescription>

Public Member Functions

- recursive subroutine runbare (this)
- recursive subroutine runbare_surrogate (this)

15.103.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· TestCase.F90

15.104 testfailure_mod Module Reference

<BriefDescription>

15.104.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

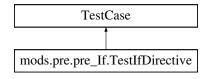
<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• TestFailure.F90

15.105 mods.pre.pre_lf.TestlfDirective Class Reference

Inheritance diagram for mods.pre.pre_lf.TestlfDirective:



Public Member Functions

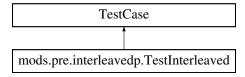
- def testTokenNotFound1
- def testNoTest
- def testIFTestFalse
- def testIFTestTrue1
- def testIFTestTrue2
- def testIFClearTokens
- def testIFClearTokensUntilEnd1

The documentation for this class was generated from the following file:

• pre_lf.py

15.106 mods.pre.interleavedp.TestInterleaved Class Reference

Inheritance diagram for mods.pre.interleavedp.TestInterleaved:



Public Member Functions

- · def test InOrder
- def test_NumberMismatch
- def test_OrderMismatch1
- def test_OrderMismatch2
- def test_OrderMismatch3
- def test_ElseMid1
- · def test ElseMid2
- def test_ElseMid3
- def test_ElseMid4
- def test_ElseMid5
- · def test_ElseMid6
- def test_ElseMid7
- def test_ElseMid8
- def test_ElseMid9
- · def test ElseMid10

The documentation for this class was generated from the following file:

· interleavedp.py

15.107 testlistener mod Module Reference

<BriefDescription>

Data Types

interface startTest

15.107.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· TestListener.F90

15.108 testmethod_mod Module Reference

<BriefDescription>

15.108.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

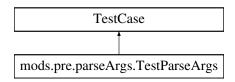
<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• TestMethod.F90

15.109 mods.pre.parseArgs.TestParseArgs Class Reference

Inheritance diagram for mods.pre.parseArgs.TestParseArgs:



Public Member Functions

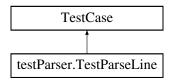
- def test_ParseArgs_OneArgWithBrackets1
- def test ParseArgs OneArgWithBrackets2
- def test_ParseArgs_OneArgWithBrackets3
- def test_ParseArgs_OneArgWithBrackets4
- def test_ParseArgs_OneArgWithBrackets5
- def test_ParseArgs_OneArgWithBrackets6
- def test ParseArgs OneArgWithBrackets7
- · def test_ParseArgs_oneArg
- def test_ParseArgs_twoArgs1
- def test_ParseArgs_twoArgs2
- · def test ParseArgs oneArgArray1
- def test ParseArgs TwoArgArray
- def test_ParseArgs_ThreeArgs

The documentation for this class was generated from the following file:

· parseArgs.py

15.110 testParser.TestParseLine Class Reference

Inheritance diagram for testParser.TestParseLine:



Public Member Functions

- def testCppSetLineAndFile
- def testGetSubroutineName
- · def testGetTypeName
- def testAtTest
- def testAtMpiTest
- def testMatchAtTestCase
- · def testMatchAtAssertEqual
- · def testMatchAtAssertOther
- def testMatchAtBefore
- def testMatchAtAfter
- · def testMatchAtSuite

15.110.1 Member Function Documentation

15.110.1.1 def testParser.TestParseLine.testAtMpiTest (self)

Check that a line starting with ' \emptyset mpitest' is detected as an annotation and that optional parameters are collected.

15.110.1.2 def testParser.TestParseLine.testAtTest (self)

Check that a line starting with '@test' is detected as an annotation.

15.110.1.3 def testParser.TestParseLine.testMatchAtAfter (self)

Check that a line starting with '@after*' ...

15.110.1.4 def testParser.TestParseLine.testMatchAtAssertEqual (self)

Check that a line starting with '@assertEqual' is detected as an annotation.

15.110.1.5 def testParser.TestParseLine.testMatchAtAssertOther (self)

Check that a line starting with '@assert*' is detected as an annotation.

15.110.1.6 def testParser.TestParseLine.testMatchAtBefore (self)

Check that a line starting with '@before*' \dots

15.110.1.7 def testParser.TestParseLine.testMatchAtSuite (self)

Check that a line starting with '@suite changes the suite name \dots

15.110.1.8 def testParser.TestParseLine.testMatchAtTestCase (self)

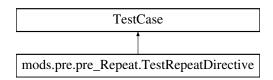
Check that a line starting with '@testcase' is detected as an annotation.

The documentation for this class was generated from the following file:

testParser.py

15.111 mods.pre.pre_Repeat.TestRepeatDirective Class Reference

Inheritance diagram for mods.pre.pre_Repeat.TestRepeatDirective:



Public Member Functions

- def test_copyBlock1
- def test_copyBlock2
- def test_copyBlock2Vars
- def test_copyBlock2VarsMulti
- def test_copyBlock2VarsMultiWithStrings
- def test_copyNaiveRecursion
- · def test_copyNaiveRecursion1
- def test_copyFunction1

The documentation for this class was generated from the following file:

· pre_Repeat.py

15.112 testresult mod Module Reference

<BriefDescription> Note: A possible extension point for user-specialized TestResults.

Public Member Functions

- type(testresult) function, pointer, public newtestresult ()
- subroutine adderror (this, aTest, exceptions)
- integer function failurecount (this)
- subroutine addlistener (this, listener)

15.112.1 Detailed Description

<BriefDescription> Note: A possible extension point for user-specialized TestResults.

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· TestResult.F90

15.113 testrunner mod Module Reference

<BriefDescription>

Public Member Functions

- type(testrunner) function newtestrunner_unit (unit)
- subroutine run (this, aTest, context)
- subroutine starttest (this, testName)

15.113.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> < Or starting here...>
```

The documentation for this module was generated from the following file:

· TestRunner.F90

15.114 testsuite_mod Module Reference

```
<BriefDescription>
```

Public Member Functions

• recursive subroutine addtest (this, aTest)

15.114.1 Detailed Description

```
<BriefDescription>
```

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

```
<A note here.> <Or starting here...>
```

The documentation for this module was generated from the following file:

· TestSuite.F90

15.115 throwfundamentaltypes_mod Module Reference

<BriefDescription>

Public Member Functions

- subroutine, public thrownonconformable (shapeExpected, shapeFound, location)
- character(len=maxlen_shape)
 function, public locationformat (iLocation)

15.115.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

ThrowFundamentalTypes.F90

15.116 unixpipeinterfaces_mod Module Reference

<BriefDescription>

Public Attributes

• integer(c_int), parameter, public close_failed = -1

15.116.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

• UnixPipeInterfaces.F90

15.117 unixprocess_mod Module Reference

<BriefDescription>

Public Member Functions

- character(len=:) function, allocatable makecommand (baseCommand, runInBackground)
- logical function isactive (this)
- character(len=:) function, allocatable getdelim (this, delimeter)
- integer function getpid (this)

15.117.1 Detailed Description

<BriefDescription>

Author

Tom Clune, NASA/GSFC SIVO

Date

07 Nov 2013

Note

<A note here.> < Or starting here...>

The documentation for this module was generated from the following file:

· UnixProcess.F90

15.118 GenerateRealArrayNewSignature.VECTOR_NORM Class Reference

Inheritance diagram for GenerateRealArrayNewSignature.VECTOR_NORM:



Public Member Functions

• def __init__

Public Attributes

- rank
- fType
- precision
- name
- declaration
- · declarations

The documentation for this class was generated from the following file:

• GenerateRealArrayNewSignature.py

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