科研开源软件创意大赛

算法精灵测试文档

参赛团队/个人名称

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# 一．测试背景

为验证产品功能的可用性进行主函数入口测试，基本语句测试，和用例测试。同时进行性能评估。

# 二．测试方案

**单元测试：**

**a. 入口测试**

**i. 指定入口函数是否正确执行**

**ii. 未指定入口函数是默认第一个函数**

**iii. 指定为一个不存在的入口函数会报错**

**b. 测试基本语句解析**

**i. Pascal中最常用的基本语句是否都能够正确执行**

**集成测试**

**使用7个常见算法用例测试**

# 三．测试用例

**1. 汉诺塔递归算法**

**2. 先序遍历算法**

**3. 中序遍历算法**

**4. 后序遍历算法**

**5. 直接快速排序算法**

**6. 快速排序算法**

**7. 归并排序算法**

# 四．测试报告

## 4.1测试结论

*（说明测试结论）*

所有被测试项目均按照预期的结果输出，测试通过。

## 4.2测试组织

*（列出所有参与测试的人员以及负责测试的用例）*

## 4.3测试环境

*（列出测试时所用的硬件和软件环境）*

硬件环境：



软件环境：

Python 2.7.16

## 4.4测试工具

*（列出测试方法及测试工具）*

**单元测试：**

进入命令行

cd ./algorithm-elf/test

python -v testBaseAlgorithm.py

**集成测试：**

打开algorithm-elf，依次点击文件->打开, 选中src/examples下的源文件

依次测试：

1. 汉诺塔递归算法

2. 先序遍历算法

3. 中序遍历算法

4. 后序遍历算法

5. 直接快速排序算法

6. 快速排序算法

7. 归并排序算法

## 4.5测试记录

a. 单元测试

# installing zipimport hook

import zipimport # builtin

# installed zipimport hook

# /usr/lib/python2.7/site.pyc matches /usr/lib/python2.7/site.py

import site # precompiled from /usr/lib/python2.7/site.pyc

# /usr/lib/python2.7/os.pyc matches /usr/lib/python2.7/os.py

import os # precompiled from /usr/lib/python2.7/os.pyc

import errno # builtin

import posix # builtin

# /usr/lib/python2.7/posixpath.pyc matches /usr/lib/python2.7/posixpath.py

import posixpath # precompiled from /usr/lib/python2.7/posixpath.pyc

# /usr/lib/python2.7/stat.pyc matches /usr/lib/python2.7/stat.py

import stat # precompiled from /usr/lib/python2.7/stat.pyc

# /usr/lib/python2.7/genericpath.pyc matches /usr/lib/python2.7/genericpath.py

import genericpath # precompiled from /usr/lib/python2.7/genericpath.pyc

# /usr/lib/python2.7/warnings.pyc matches /usr/lib/python2.7/warnings.py

import warnings # precompiled from /usr/lib/python2.7/warnings.pyc

# /usr/lib/python2.7/linecache.pyc matches /usr/lib/python2.7/linecache.py

import linecache # precompiled from /usr/lib/python2.7/linecache.pyc

# /usr/lib/python2.7/types.pyc matches /usr/lib/python2.7/types.py

import types # precompiled from /usr/lib/python2.7/types.pyc

# /usr/lib/python2.7/UserDict.pyc matches /usr/lib/python2.7/UserDict.py

import UserDict # precompiled from /usr/lib/python2.7/UserDict.pyc

# /usr/lib/python2.7/\_abcoll.pyc matches /usr/lib/python2.7/\_abcoll.py

import \_abcoll # precompiled from /usr/lib/python2.7/\_abcoll.pyc

# /usr/lib/python2.7/abc.pyc matches /usr/lib/python2.7/abc.py

import abc # precompiled from /usr/lib/python2.7/abc.pyc

# /usr/lib/python2.7/\_weakrefset.pyc matches /usr/lib/python2.7/\_weakrefset.py

import \_weakrefset # precompiled from /usr/lib/python2.7/\_weakrefset.pyc

import \_weakref # builtin

# /usr/lib/python2.7/copy\_reg.pyc matches /usr/lib/python2.7/copy\_reg.py

import copy\_reg # precompiled from /usr/lib/python2.7/copy\_reg.pyc

# /usr/lib/python2.7/traceback.pyc matches /usr/lib/python2.7/traceback.py

import traceback # precompiled from /usr/lib/python2.7/traceback.pyc

# /usr/lib/python2.7/sysconfig.pyc matches /usr/lib/python2.7/sysconfig.py

import sysconfig # precompiled from /usr/lib/python2.7/sysconfig.pyc

# /usr/lib/python2.7/re.pyc matches /usr/lib/python2.7/re.py

import re # precompiled from /usr/lib/python2.7/re.pyc

# /usr/lib/python2.7/sre\_compile.pyc matches /usr/lib/python2.7/sre\_compile.py

import sre\_compile # precompiled from /usr/lib/python2.7/sre\_compile.pyc

import \_sre # builtin

# /usr/lib/python2.7/sre\_parse.pyc matches /usr/lib/python2.7/sre\_parse.py

import sre\_parse # precompiled from /usr/lib/python2.7/sre\_parse.pyc

# /usr/lib/python2.7/sre\_constants.pyc matches /usr/lib/python2.7/sre\_constants.py

import sre\_constants # precompiled from /usr/lib/python2.7/sre\_constants.pyc

dlopen("/usr/lib/python2.7/lib-dynload/\_locale.dll", 2);

import \_locale # dynamically loaded from /usr/lib/python2.7/lib-dynload/\_locale.dll

# /usr/lib/python2.7/\_sysconfigdata.pyc matches /usr/lib/python2.7/\_sysconfigdata.py

import \_sysconfigdata # precompiled from /usr/lib/python2.7/\_sysconfigdata.pyc

import encodings # directory /usr/lib/python2.7/encodings

# /usr/lib/python2.7/encodings/\_\_init\_\_.pyc matches /usr/lib/python2.7/encodings/\_\_init\_\_.py

import encodings # precompiled from /usr/lib/python2.7/encodings/\_\_init\_\_.pyc

# /usr/lib/python2.7/codecs.pyc matches /usr/lib/python2.7/codecs.py

import codecs # precompiled from /usr/lib/python2.7/codecs.pyc

import \_codecs # builtin

# /usr/lib/python2.7/encodings/aliases.pyc matches /usr/lib/python2.7/encodings/aliases.py

import encodings.aliases # precompiled from /usr/lib/python2.7/encodings/aliases.pyc

# /usr/lib/python2.7/encodings/utf\_8.pyc matches /usr/lib/python2.7/encodings/utf\_8.py

import encodings.utf\_8 # precompiled from /usr/lib/python2.7/encodings/utf\_8.pyc

Python 2.7.16 (default, Mar 20 2019, 12:15:19)

[GCC 7.4.0] on cygwin

Type "help", "copyright", "credits" or "license" for more information.

# /usr/lib/python2.7/gettext.pyc matches /usr/lib/python2.7/gettext.py

import gettext # precompiled from /usr/lib/python2.7/gettext.pyc

# /usr/lib/python2.7/locale.pyc matches /usr/lib/python2.7/locale.py

import locale # precompiled from /usr/lib/python2.7/locale.pyc

dlopen("/usr/lib/python2.7/lib-dynload/operator.dll", 2);

import operator # dynamically loaded from /usr/lib/python2.7/lib-dynload/operator.dll

# /usr/lib/python2.7/functools.pyc matches /usr/lib/python2.7/functools.py

import functools # precompiled from /usr/lib/python2.7/functools.pyc

dlopen("/usr/lib/python2.7/lib-dynload/\_functools.dll", 2);

import \_functools # dynamically loaded from /usr/lib/python2.7/lib-dynload/\_functools.dll

# /usr/lib/python2.7/copy.pyc matches /usr/lib/python2.7/copy.py

import copy # precompiled from /usr/lib/python2.7/copy.pyc

# /usr/lib/python2.7/weakref.pyc matches /usr/lib/python2.7/weakref.py

import weakref # precompiled from /usr/lib/python2.7/weakref.pyc

# /usr/lib/python2.7/struct.pyc matches /usr/lib/python2.7/struct.py

import struct # precompiled from /usr/lib/python2.7/struct.pyc

dlopen("/usr/lib/python2.7/lib-dynload/\_struct.dll", 2);

import \_struct # dynamically loaded from /usr/lib/python2.7/lib-dynload/\_struct.dll

import unittest # directory /usr/lib/python2.7/unittest

# /usr/lib/python2.7/unittest/\_\_init\_\_.pyc matches /usr/lib/python2.7/unittest/\_\_init\_\_.py

import unittest # precompiled from /usr/lib/python2.7/unittest/\_\_init\_\_.pyc

# /usr/lib/python2.7/unittest/result.pyc matches /usr/lib/python2.7/unittest/result.py

import unittest.result # precompiled from /usr/lib/python2.7/unittest/result.pyc

# /usr/lib/python2.7/StringIO.pyc matches /usr/lib/python2.7/StringIO.py

import StringIO # precompiled from /usr/lib/python2.7/StringIO.pyc

# /usr/lib/python2.7/unittest/util.pyc matches /usr/lib/python2.7/unittest/util.py

import unittest.util # precompiled from /usr/lib/python2.7/unittest/util.pyc

# /usr/lib/python2.7/collections.pyc matches /usr/lib/python2.7/collections.py

import collections # precompiled from /usr/lib/python2.7/collections.pyc

dlopen("/usr/lib/python2.7/lib-dynload/\_collections.dll", 2);

import \_collections # dynamically loaded from /usr/lib/python2.7/lib-dynload/\_collections.dll

# /usr/lib/python2.7/keyword.pyc matches /usr/lib/python2.7/keyword.py

import keyword # precompiled from /usr/lib/python2.7/keyword.pyc

# /usr/lib/python2.7/heapq.pyc matches /usr/lib/python2.7/heapq.py

import heapq # precompiled from /usr/lib/python2.7/heapq.pyc

dlopen("/usr/lib/python2.7/lib-dynload/itertools.dll", 2);

import itertools # dynamically loaded from /usr/lib/python2.7/lib-dynload/itertools.dll

dlopen("/usr/lib/python2.7/lib-dynload/\_heapq.dll", 2);

import \_heapq # dynamically loaded from /usr/lib/python2.7/lib-dynload/\_heapq.dll

import thread # builtin

# /usr/lib/python2.7/unittest/case.pyc matches /usr/lib/python2.7/unittest/case.py

import unittest.case # precompiled from /usr/lib/python2.7/unittest/case.pyc

# /usr/lib/python2.7/difflib.pyc matches /usr/lib/python2.7/difflib.py

import difflib # precompiled from /usr/lib/python2.7/difflib.pyc

# /usr/lib/python2.7/pprint.pyc matches /usr/lib/python2.7/pprint.py

import pprint # precompiled from /usr/lib/python2.7/pprint.pyc

dlopen("/usr/lib/python2.7/lib-dynload/cStringIO.dll", 2);

import cStringIO # dynamically loaded from /usr/lib/python2.7/lib-dynload/cStringIO.dll

# /usr/lib/python2.7/unittest/suite.pyc matches /usr/lib/python2.7/unittest/suite.py

import unittest.suite # precompiled from /usr/lib/python2.7/unittest/suite.pyc

# /usr/lib/python2.7/unittest/loader.pyc matches /usr/lib/python2.7/unittest/loader.py

import unittest.loader # precompiled from /usr/lib/python2.7/unittest/loader.pyc

# /usr/lib/python2.7/fnmatch.pyc matches /usr/lib/python2.7/fnmatch.py

import fnmatch # precompiled from /usr/lib/python2.7/fnmatch.pyc

# /usr/lib/python2.7/unittest/main.pyc matches /usr/lib/python2.7/unittest/main.py

import unittest.main # precompiled from /usr/lib/python2.7/unittest/main.pyc

# /usr/lib/python2.7/unittest/runner.pyc matches /usr/lib/python2.7/unittest/runner.py

import unittest.runner # precompiled from /usr/lib/python2.7/unittest/runner.pyc

dlopen("/usr/lib/python2.7/lib-dynload/time.dll", 2);

import time # dynamically loaded from /usr/lib/python2.7/lib-dynload/time.dll

# /usr/lib/python2.7/unittest/signals.pyc matches /usr/lib/python2.7/unittest/signals.py

import unittest.signals # precompiled from /usr/lib/python2.7/unittest/signals.pyc

import dsException # precompiled from D:/repo/algorithm-elf/src/dsException.pyc

# D:/repo/algorithm-elf/src/algorithm/baseAlgorithm.pyc matches D:/repo/algorithm-elf/src/algorithm/baseAlgorithm.py

import baseAlgorithm # precompiled from D:/repo/algorithm-elf/src/algorithm/baseAlgorithm.pyc

# D:/repo/algorithm-elf/src/dsParameter.pyc matches D:/repo/algorithm-elf/src/dsParameter.py

import dsParameter # precompiled from D:/repo/algorithm-elf/src/dsParameter.pyc

# /usr/lib/python2.7/getopt.pyc matches /usr/lib/python2.7/getopt.py

import getopt # precompiled from /usr/lib/python2.7/getopt.pyc

.F

======================================================================

FAIL: testbuildTree (\_\_main\_\_.TestbaseAlgorithm)

----------------------------------------------------------------------

Traceback (most recent call last):

File "testBaseAlgorithm.py", line 39, in testbuildTree

u'A : [ B, C ]; B : [ D ]; D; C'

AssertionError: 'A : [ B, C ]' != u'A : [ B, C ]; B : [ D ]; D; C'

----------------------------------------------------------------------

Ran 2 tests in 0.001s

FAILED (failures=1)

# clear \_\_builtin\_\_.\_

# clear sys.path

# clear sys.argv

# clear sys.ps1

# clear sys.ps2

# clear sys.exitfunc

# clear sys.exc\_type

# clear sys.exc\_value

# clear sys.exc\_traceback

# clear sys.last\_type

# clear sys.last\_value

# clear sys.last\_traceback

# clear sys.path\_hooks

# clear sys.path\_importer\_cache

# clear sys.meta\_path

# clear sys.flags

# clear sys.float\_info

# restore sys.stdin

# restore sys.stdout

# restore sys.stderr

# cleanup \_\_main\_\_

# cleanup[1] sysconfig

# cleanup[1] unittest.main

# cleanup[1] zipimport

# cleanup[1] cStringIO

# cleanup[1] abc

# cleanup[1] exceptions

# cleanup[1] \_functools

# cleanup[1] thread

# cleanup[1] StringIO

# cleanup[1] itertools

# cleanup[1] \_collections

# cleanup[1] unittest

# cleanup[1] \_heapq

# cleanup[1] sre\_constants

# cleanup[1] \_warnings

# cleanup[1] \_codecs

# cleanup[1] \_sysconfigdata

# cleanup[1] \_struct

# cleanup[1] keyword

# cleanup[1] posix

# cleanup[1] fnmatch

# cleanup[1] site

# cleanup[1] gettext

# cleanup[1] getopt

# cleanup[1] baseAlgorithm

# cleanup[1] unittest.signals

# cleanup[1] dsParameter

# cleanup[1] \_weakref

# cleanup[1] \_weakrefset

# cleanup[1] struct

# cleanup[1] signal

# cleanup[1] locale

# cleanup[1] encodings

# cleanup[1] unittest.runner

# cleanup[1] unittest.loader

# cleanup[1] dsException

# cleanup[1] operator

# cleanup[1] copy

# cleanup[1] encodings.aliases

# cleanup[1] time

# cleanup[1] encodings.utf\_8

# cleanup[1] unittest.suite

# cleanup[1] codecs

# cleanup[1] weakref

# cleanup[1] unittest.case

# cleanup[1] unittest.result

# cleanup[1] difflib

# cleanup[1] functools

# cleanup[1] pprint

# cleanup[1] collections

# cleanup[1] unittest.util

# cleanup[1] re

# cleanup[1] \_locale

# cleanup[1] traceback

# cleanup[1] sre\_compile

# cleanup[1] heapq

# cleanup[1] \_sre

# cleanup[1] sre\_parse

# cleanup[2] UserDict

# cleanup[2] os

# cleanup[2] posixpath

# cleanup[2] errno

# cleanup[2] os.path

# cleanup[2] copy\_reg

# cleanup[2] linecache

# cleanup[2] \_abcoll

# cleanup[2] genericpath

# cleanup[2] stat

# cleanup[2] warnings

# cleanup[2] types

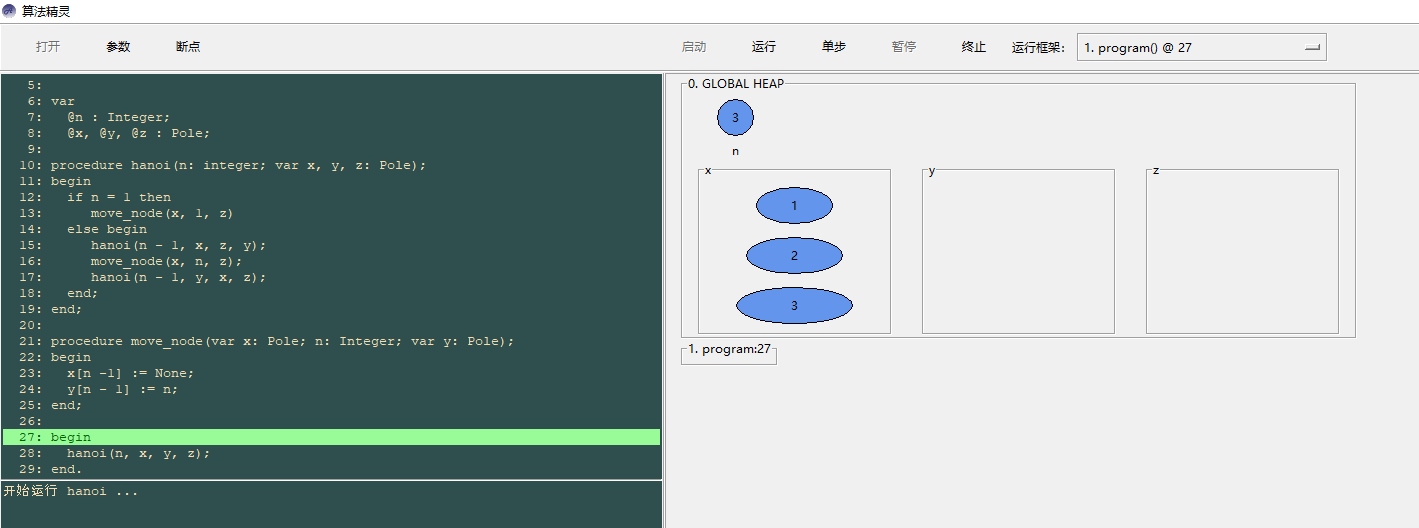
# cleanup sys

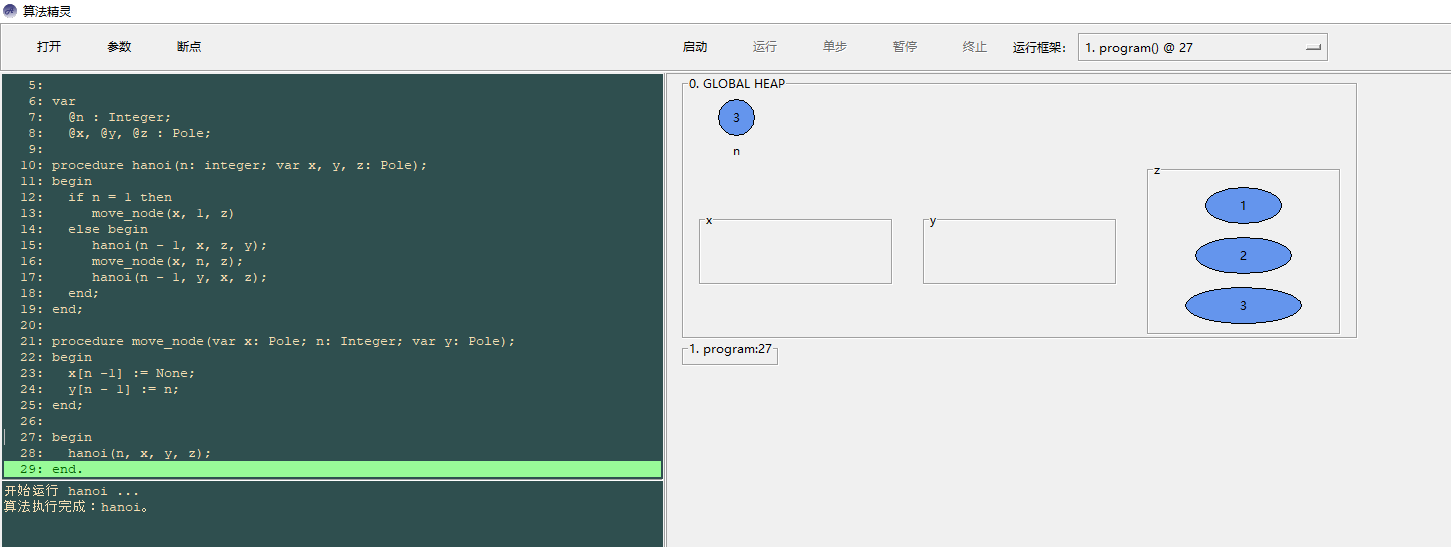
# cleanup \_\_builtin\_\_

# cleanup ints: 26 unfreed ints

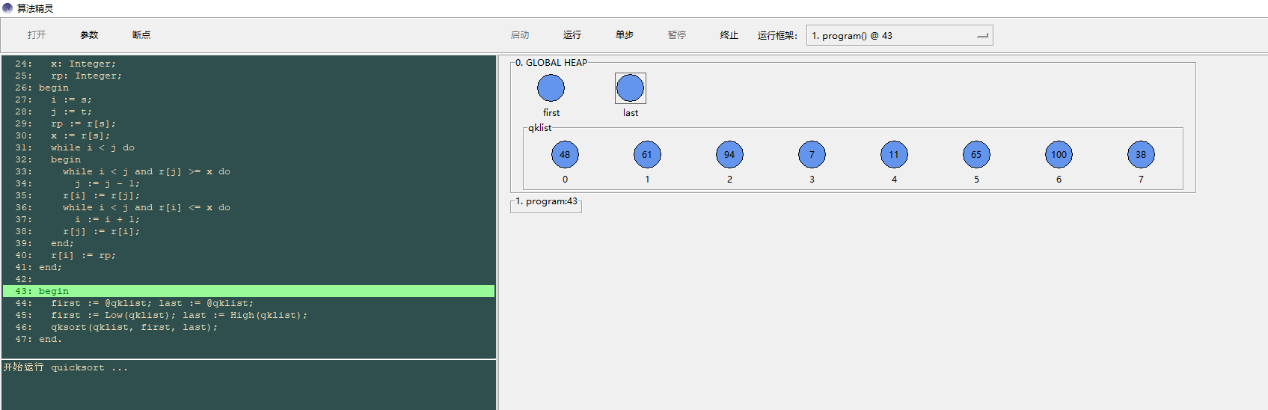
# cleanup floats

b. 汉诺塔递归



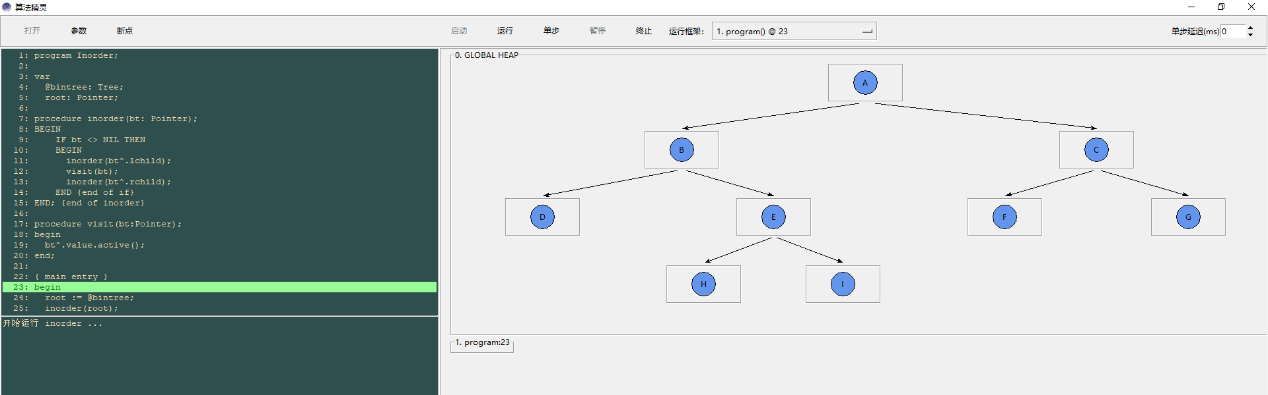


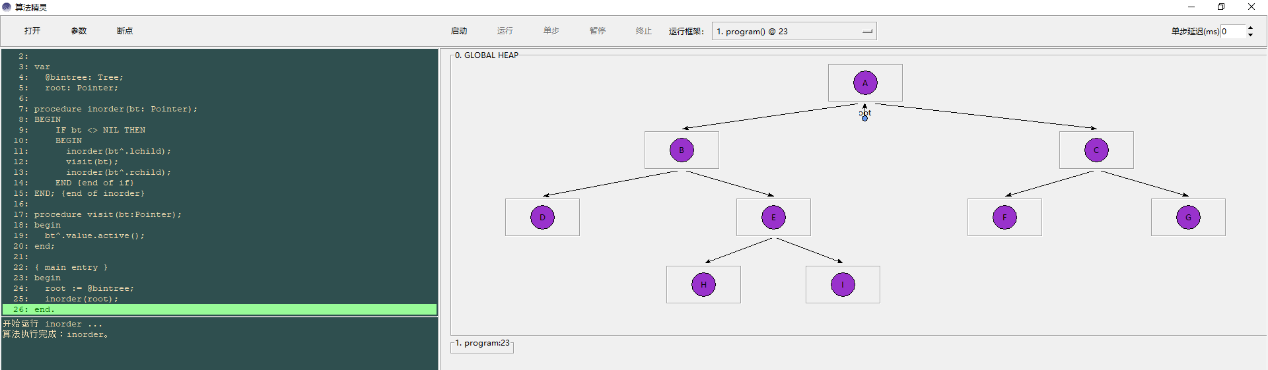
c. 快速排序算法



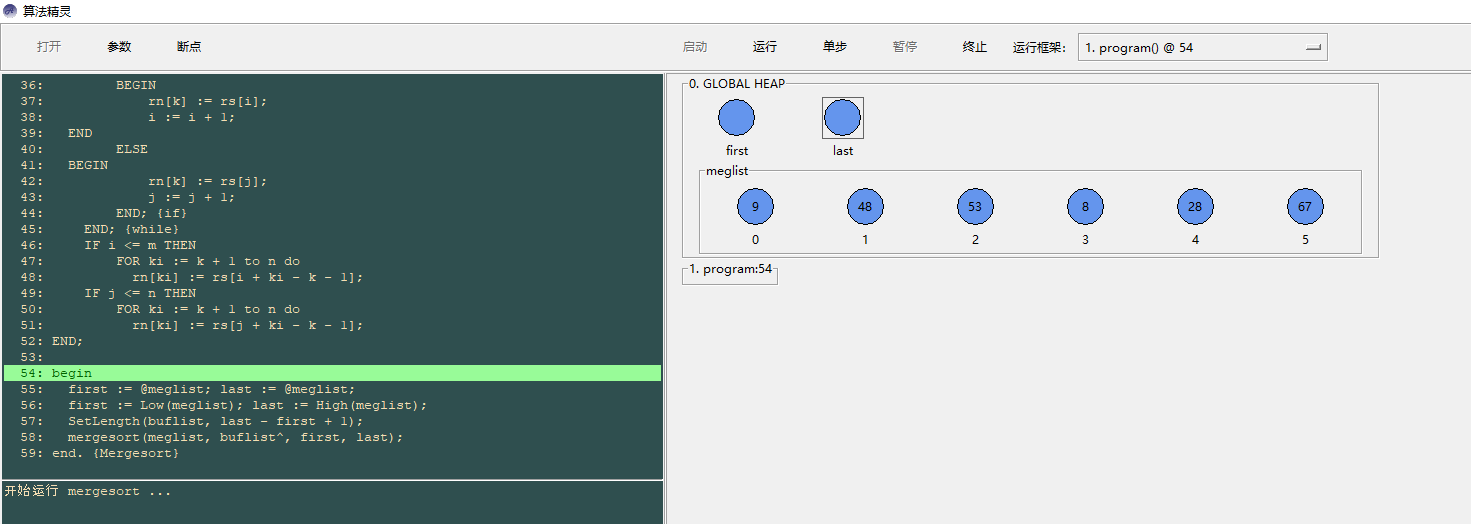


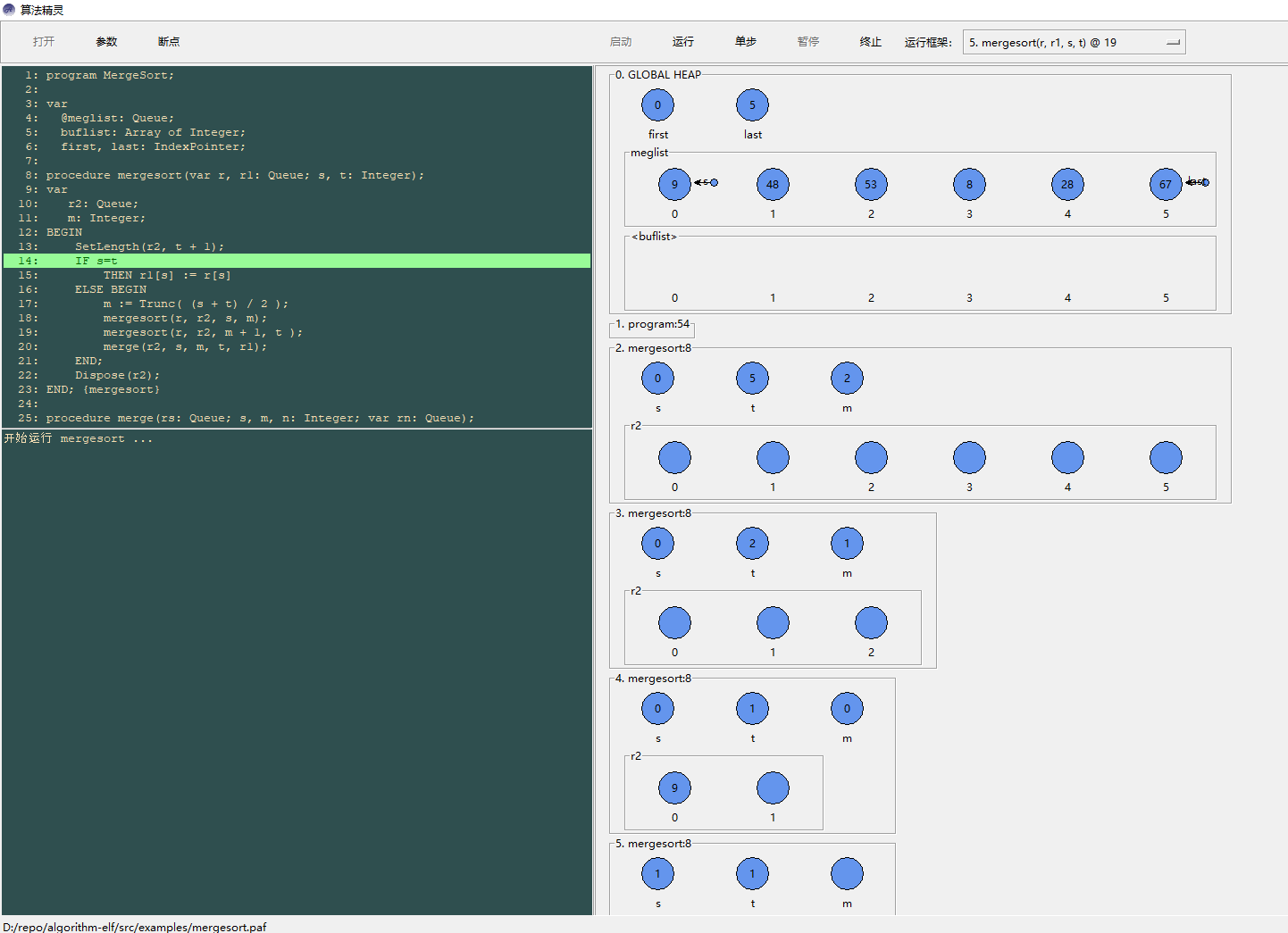
d. 先序遍历算法





e. 归并排序算法







以上测试记录表明所有被测试项目均按照预期的结果输出，测试通过。

## 4.6Bug记录

*（统计所有bug，分析严重程度以及在所有bug中所占的比例）*