# Test Case for System Test

**System test description:**

The program reads a line from a Pascal source code file (NEWTON.PAS), output that to the output file (ActualOutput.txt) with the line number and then proceeds to move through the line character by character building tokens. Each token must be identified as what it is; a keyword (reserved word) in Pascal, a literal (which is an identifier, a number, or a string), or one of many special characters in Pascal.

**System test table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function to be test** | **Procedure name** | **Input parameter** | **Output or Return value** | **Expected result** | **Test command line** |
| Extract the content of an input file (NEWTON.PAS) and produce an identical output (ActualOutput.txt) with line numbers | int main(int argc, const char \* argv[]) | NEWTON.PAS | ActualOutput.txt | Expected output (ActualOutput.txt) is identical to input (sample\_output.txt) with each line numbered. | ./lab3 NEWTON.PAS > ActualOutput.txt |

# Input data (NEWTON.PAS):

PROGRAM newton (input, output);

CONST

epsilon = 1e-6;

VAR

number, root, sqroot : real;

BEGIN

REPEAT

writeln;

write('Enter new number (0 to quit): ');

read(number);

IF number = 0 THEN BEGIN

writeln(number:12:6, 0.0:12:6);

END

ELSE IF number < 0 THEN BEGIN

writeln('\*\*\* ERROR: number < 0');

END

ELSE BEGIN

sqroot := sqrt(number);

writeln(number:12:6, sqroot:12:6);

writeln;

root := 1;

REPEAT

root := (number/root + root)/2;

writeln(root:24:6,

100\*abs(root - sqroot)/sqroot:12:2,

'%')

UNTIL abs(number/sqr(root) - 1) < epsilon;

END

UNTIL number = 0

END.

# Expected Output data (sample\_output.txt):

Page 1 /Users/bholto/Desktop/CourseFolder\_Bryce/Labs/Lab2/NEWTON.PAS Thu Mar 4 08:51:35 2014

1: PROGRAM newton (input, output);

>> PROGRAM program

>> <IDENTIFIER> newton

>> ( (

>> <IDENTIFIER> input

>> , ,

>> <IDENTIFIER> output

>> ) )

>> ; ;

2:

3: CONST

>> CONST const

4: epsilon = 1e-6;

>> <IDENTIFIER> epsilon

>> = =

>> <NUMBER> 1e-06

>> ; ;

5:

6: VAR

>> VAR var

7: number, root, sqroot : real;

>> <IDENTIFIER> number

>> , ,

>> <IDENTIFIER> root

>> , ,

>> <IDENTIFIER> sqroot

>> : :

>> <IDENTIFIER> real

>> ; ;

8:

9: BEGIN

>> BEGIN begin

10: REPEAT

>> REPEAT repeat

11: writeln;

>> <IDENTIFIER> writeln

>> ; ;

12: write('Enter new number (0 to quit): ');

>> <IDENTIFIER> write

>> ( (

>> <STRING> Enter new number (0 to quit):

>> ) )

>> ; ;

13: read(number);

>> <IDENTIFIER> read

>> ( (

>> <IDENTIFIER> number

>> ) )

>> ; ;

14:

Page 2 /Users/bholto/Desktop/CourseFolder\_Bryce/Labs/Lab2/NEWTON.PAS Thu Mar 4 08:51:35 2014

15: IF number = 0 THEN BEGIN

>> IF if

>> <IDENTIFIER> number

>> = =

>> <NUMBER> 0

>> THEN then

>> BEGIN begin

16: writeln(number:12:6, 0.0:12:6);

>> <IDENTIFIER> writeln

>> ( (

>> <IDENTIFIER> number

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> , ,

>> <NUMBER> 0

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> ) )

>> ; ;

17: END

>> END end

18: ELSE IF number < 0 THEN BEGIN

>> ELSE else

>> IF if

>> <IDENTIFIER> number

>> < <

>> <NUMBER> 0

>> THEN then

>> BEGIN begin

19: writeln('\*\*\* ERROR: number < 0');

>> <IDENTIFIER> writeln

>> ( (

>> <STRING> \*\*\* ERROR: number < 0

>> ) )

>> ; ;

20: END

>> END end

21: ELSE BEGIN

>> ELSE else

>> BEGIN begin

22: sqroot := sqrt(number);

>> <IDENTIFIER> sqroot

>> := :=

>> <IDENTIFIER> sqrt

>> ( (

>> <IDENTIFIER> number

Page 3 /Users/bholto/Desktop/CourseFolder\_Bryce/Labs/Lab2/NEWTON.PAS Thu Mar 4 08:51:35 2014

>> ) )

>> ; ;

23: writeln(number:12:6, sqroot:12:6);

>> <IDENTIFIER> writeln

>> ( (

>> <IDENTIFIER> number

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> , ,

>> <IDENTIFIER> sqroot

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> ) )

>> ; ;

24: writeln;

>> <IDENTIFIER> writeln

>> ; ;

25:

26: root := 1;

>> <IDENTIFIER> root

>> := :=

>> <NUMBER> 1

>> ; ;

27: REPEAT

>> REPEAT repeat

28: root := (number/root + root)/2;

>> <IDENTIFIER> root

>> := :=

>> ( (

>> <IDENTIFIER> number

>> / /

>> <IDENTIFIER> root

>> + +

>> <IDENTIFIER> root

>> ) )

>> / /

>> <NUMBER> 2

>> ; ;

29: writeln(root:24:6,

>> <IDENTIFIER> writeln

>> ( (

>> <IDENTIFIER> root

>> : :

>> <NUMBER> 24

>> : :

>> <NUMBER> 6

Page 4 /Users/bholto/Desktop/CourseFolder\_Bryce/Labs/Lab2/NEWTON.PAS Thu Mar e 08:51:35 2014

>> , ,

30: 100\*abs(root - sqroot)/sqroot:12:2,

>> <NUMBER> 100

>> \* \*

>> <IDENTIFIER> abs

>> ( (

>> <IDENTIFIER> root

>> - -

>> <IDENTIFIER> sqroot

>> ) )

>> / /

>> <IDENTIFIER> sqroot

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 2

>> , ,

31: '%')

>> <STRING> %

>> ) )

32: UNTIL abs(number/sqr(root) - 1) < epsilon;

>> UNTIL until

>> <IDENTIFIER> abs

>> ( (

>> <IDENTIFIER> number

>> / /

>> <IDENTIFIER> sqr

>> ( (

>> <IDENTIFIER> root

>> ) )

>> - -

>> <NUMBER> 1

>> ) )

>> < <

>> <IDENTIFIER> epsilon

>> ; ;

33: END

>> END end

34: UNTIL number = 0

>> UNTIL until

>> <IDENTIFIER> number

>> = =

>> <NUMBER> 0

35: END.

>> END end

>> . .

# Actual program output (ActualOutput.txt):

Page 1 NEWTON.PAS Sun Mar 16 00:49:11 2014

1: PROGRAM newton (input, output);

>> PROGRAM program

>> <IDENTIFIER> newton

>> ( (

>> <IDENTIFIER> input

>> , ,

>> <IDENTIFIER> output

>> ) )

>> ; ;

2:

3: CONST

>> CONST const

4: epsilon = 1e-6;

>> <IDENTIFIER> epsilon

>> = =

>> <NUMBER> 1e-6

>> ; ;

5:

6: VAR

>> VAR var

7: number, root, sqroot : real;

>> <IDENTIFIER> number

>> , ,

>> <IDENTIFIER> root

>> , ,

>> <IDENTIFIER> sqroot

>> : :

>> <IDENTIFIER> real

>> ; ;

8:

9: BEGIN

>> BEGIN begin

10: REPEAT

>> REPEAT repeat

11: writeln;

>> <IDENTIFIER> writeln

>> ; ;

12: write('Enter new number (0 to quit): ');

>> <IDENTIFIER> write

>> ( (

>> <STRING> Enter new number (0 to quit):

>> ) )

>> ; ;

13: read(number);

>> <IDENTIFIER> read

>> ( (

>> <IDENTIFIER> number

Page 2 NEWTON.PAS Sun Mar 16 00:49:11 2014

>> ) )

>> ; ;

14:

15: IF number = 0 THEN BEGIN

>> IF if

>> <IDENTIFIER> number

>> = =

>> <NUMBER> 0

>> THEN then

>> BEGIN begin

16: writeln(number:12:6, 0.0:12:6);

>> <IDENTIFIER> writeln

>> ( (

>> <IDENTIFIER> number

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> , ,

>> <NUMBER> 0.0

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> ) )

>> ; ;

17: END

>> END end

18: ELSE IF number < 0 THEN BEGIN

>> ELSE else

>> IF if

>> <IDENTIFIER> number

>> < <

>> <NUMBER> 0

>> THEN then

>> BEGIN begin

19: writeln('\*\*\* ERROR: number < 0');

>> <IDENTIFIER> writeln

>> ( (

>> <STRING> \*\*\* ERROR: number < 0

>> ) )

>> ; ;

20: END

>> END end

21: ELSE BEGIN

>> ELSE else

>> BEGIN begin

22: sqroot := sqrt(number);

>> <IDENTIFIER> sqroot

Page 3 NEWTON.PAS Sun Mar 16 00:49:11 2014

>> : :

>> = =

>> <IDENTIFIER> sqrt

>> ( (

>> <IDENTIFIER> number

>> ) )

>> ; ;

23: writeln(number:12:6, sqroot:12:6);

>> <IDENTIFIER> writeln

>> ( (

>> <IDENTIFIER> number

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> , ,

>> <IDENTIFIER> sqroot

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 6

>> ) )

>> ; ;

24: writeln;

>> <IDENTIFIER> writeln

>> ; ;

25:

26: root := 1;

>> <IDENTIFIER> root

>> : :

>> = =

>> <NUMBER> 1

>> ; ;

27: REPEAT

>> REPEAT repeat

28: root := (number/root + root)/2;

>> <IDENTIFIER> root

>> : :

>> = =

>> ( (

>> <IDENTIFIER> number

>> / /

>> <IDENTIFIER> root

>> + +

>> <IDENTIFIER> root

>> ) )

>> / /

>> <NUMBER> 2

>> ; ;

Page 4 NEWTON.PAS Sun Mar 16 00:49:11 2014

29: writeln(root:24:6,

>> <IDENTIFIER> writeln

>> ( (

>> <IDENTIFIER> root

>> : :

>> <NUMBER> 24

>> : :

>> <NUMBER> 6

>> , ,

30: 100\*abs(root - sqroot)/sqroot:12:2,

>> <NUMBER> 100\*abs(root

>> - -

>> <IDENTIFIER> sqroot

>> ) )

>> / /

>> <IDENTIFIER> sqroot

>> : :

>> <NUMBER> 12

>> : :

>> <NUMBER> 2

>> , ,

31: '%')

>> <STRING> %

>> ) )

32: UNTIL abs(number/sqr(root) - 1) < epsilon;

>> UNTIL until

>> <IDENTIFIER> abs

>> ( (

>> <IDENTIFIER> number

>> / /

>> <IDENTIFIER> sqr

>> ( (

>> <IDENTIFIER> root

>> ) )

>> - -

>> <NUMBER> 1

>> ) )

>> < <

>> <IDENTIFIER> epsilon

>> ; ;

33: END

>> END end

34: UNTIL number = 0

>> UNTIL until

>> <IDENTIFIER> number

>> = =

>> <NUMBER> 0

>> ) )

>> - -

>> <NUMBER> 1

Page 5 NEWTON.PAS Sun Mar 16 00:49:11 2014

>> ) )

>> < <

>> <IDENTIFIER> epsilon

>> ; ;

35: END.

>> END end

>> . .