

Programming Exercise - Parser

Problem Credit: TA 黃柏燁 alec2515@gmail.com

Hspice is a device level circuit simulator. It takes a spice file as input and produces output describing the requested simulation of the circuit. Although Hspice is widely used by circuit designers, it is difficult to easily observe measurement results since the report file generated by Hspice is in specific format and is hard to read. Therefore, you are asked to create a program that can automatically convert the measurement results from the report file to a **comma-separated values** (.csv) file which contains the information we concern. Then we can easily plot the corresponding figures.

Input file format: Your program will take a Hspice report file (.lis) as input. An example is shown as follow:

```
.
.
.
**info** set option symb=1 internally to help for convergence.
*****
***** option summary
*****
runlvl = 3          bypass = 2
Opening plot unit= 15
file=iv_rbl.pa0

*****
.tspe

***** dc transfer curves tnom= 25.000 temp= 25.000 *****
X

      volt      current
          vpos
100.00000m    -2.4267u
150.00000m    657.0551u
200.00000m     1.2448m
250.00000m     1.7610m
300.00000m     2.2060m
```

350.00000m	2.5804m
400.00000m	2.8853m
450.00000m	3.1225m
500.00000m	3.2956m
550.00000m	3.4130m
600.00000m	3.4908m
650.00000m	3.5458m
700.00000m	3.5881m
750.00000m	3.6226m
800.00000m	3.6518m
850.00000m	3.6771m
900.00000m	3.6994m
950.00000m	3.7194m
1.00000	3.7374m

y

1***** HSPICE -- H-2013.03-SP2 32-BIT (Aug 26 2013) RHEL32 *****

.tspc

.
.
.

In the above report, all information before a single line contains “x” gives the option settings of the simulation, which can be ignored in this exercise. Then the voltage-current information is then shown in the following lines. Finally, a single line contains “y” represents the end of the voltage-current information. All lines after y can also be ignored in this exercise. In each line, the left value shows the voltage and the right value represents the current value. Note that the unit of each line may be different. Your program should only get information between “x” sign and “y” sign. **Do not get “vpos”.**

Output file format: Your program will generate a comma-separated value (.csv) file with all voltage-current pairs, and calculate the average current. An example is shown as follows:

```
volt,current
0.1,-0.0024267
0.15,0.6570551
0.2,1.2448
0.25,1.761
0.3,2.206
0.35,2.5804
0.4,2.8853
0.45,3.1225
0.5,3.2956
0.55,3.413
0.6,3.4908
0.65,3.5458
0.7,3.5881
0.75,3.6226
0.8,3.6518
0.85,3.6771
0.9,3.6994
0.95,3.7194
1,3.7374
Avg,2.83661202
```

Data structure: You can use any data structure to realize your program.

Requirement: You have to write this program in C or C++. We will use the workstation to judge your program by the following commend:

\$program.out test1.lis test1.csv

where the first term is the executable file, the second term is the input file name, and the third term is the output file name.

Hint: You may use `int argc` and `char*argv[]`

The unit of voltage and current in output file are **voltage (V)** and **micro ampere (mA)**, respectively. To fit this requirement, your program should always convert all the result into required unit before putting it into output file.

If you have any questions, please e-mail me: andygchen@ee.ncu.edu.tw