HSPICE (Athena) Quickstart Guide

If you really cannot access a PC to run LTSpice, you can complete your simulations using HSPICE, a non-graphical SPICE compiler available on Athena, and plot your output files using Avanwaves.

Write your SPICE file using any text editor and save it with a .sp extension.

There are main sections in a SPICE file are the following:
   A. **The netlist**: Netlist is a designation for a computer readable representation of the circuit schematic.
   B. **The models**: A model in SPICE is a description of the parameters of the equations used by spice to analyze the circuit.
   C. **The analysis to be performed**: For example, a DC sweep from 0 to 1.0 V with 0.01 V increments, or a transient analysis for 100 ps with step 0.01 ps.
   D. **The end of the file**: This isn't really a main section, but HSPICE won't work without it, and many people forget about it. Always put a .end statement at the end of your file.

Also, note that HSPICE always treats the first line of your netlist as a comment.

Use the same device models as given for LTSpice but with the .sp extension. A minimum size instantiation of the MOSFET models is shown below:

```
X1 OUT IN VDD VDD PFET lg=1.5u wg=6u
X2 OUT IN GND GND NFET lg=1.5u wg=6u
```

A sample HSPICE inverter SPICE file may look like the following:

```
* Netlist
vdd 1 0 3
vin in 0 3
X1 OUT in 1 1 PFET lg=1.5u wg=6u
X2 OUT in 0 0 NFET lg=1.5u wg=6u
* Models
.include 'filename.sp'
* Analysis (DC Sweep)
* post option necessary for awaves
.options nomod post
.dc vin 0 pvdd 0.01
.end
```

To run HSPICE on a SPICE file '*[filename]*.sp' and plot the results in Awaves, use the following commands:

```
% add hspice
% hspice filename.sp > filename.out &
% awaves filename &
```

Documentation for HSPICE and Awaves can be found at:
/mit/hspice/Z-2007.03-SP1/hspice/docs/hspice_sa.pdf
/mit/hspice/Z-2007.03-SP1/hspice/docs/avanwaves.pdf

Note: Awaves does not run on Linux. To run plot your waveforms while on a Linux box:
```
% ssh -Y x.dialup.mit.edu
% add hspice
% awaves name &
```

MIT OpenCourseWare
http://ocw.mit.edu

6.012 Microelectronic Devices and Circuits
Spring 2009