

# Ngspice Exercise

August 1, 2018

## 1 Comparator using IC LM311

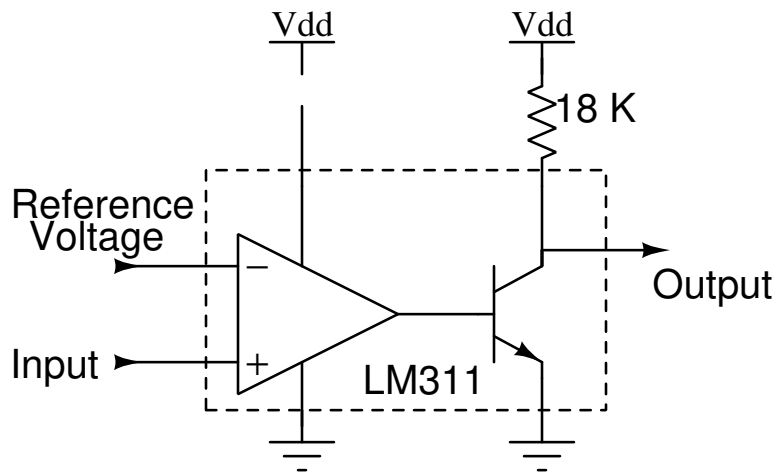


Figure 1: Comparator using LM311

### Questions:

1. Write Netlist for the above circuit.
2. Use Model File given in folder for IC LM311.
3. Use  $V_{dd} = 12V$  and  $V_{ss} = 0V$  for powering the IC.
4. Set a 2V DC as reference Voltage.
5. Give sine wave of amplitude 5V and frequency 1000Hz with 5V offset as input. Input has to be given to Non-inverting terminal of comparator.
6. Perform Transient Analysis. Plot input and output waveforms.