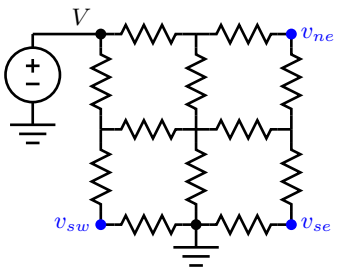
Numerical Analysis

Homework 4. Resistor Networks

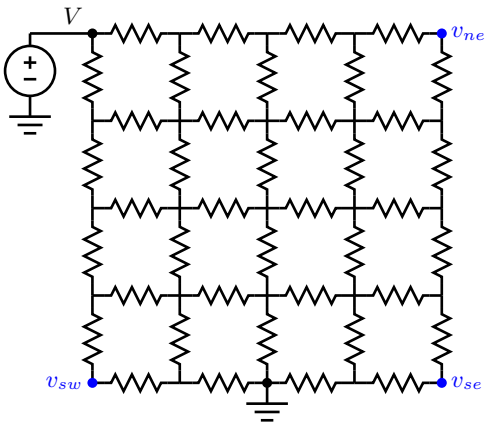
Due: March 31, 2015

Please formulate and solve the following resistor network problems.

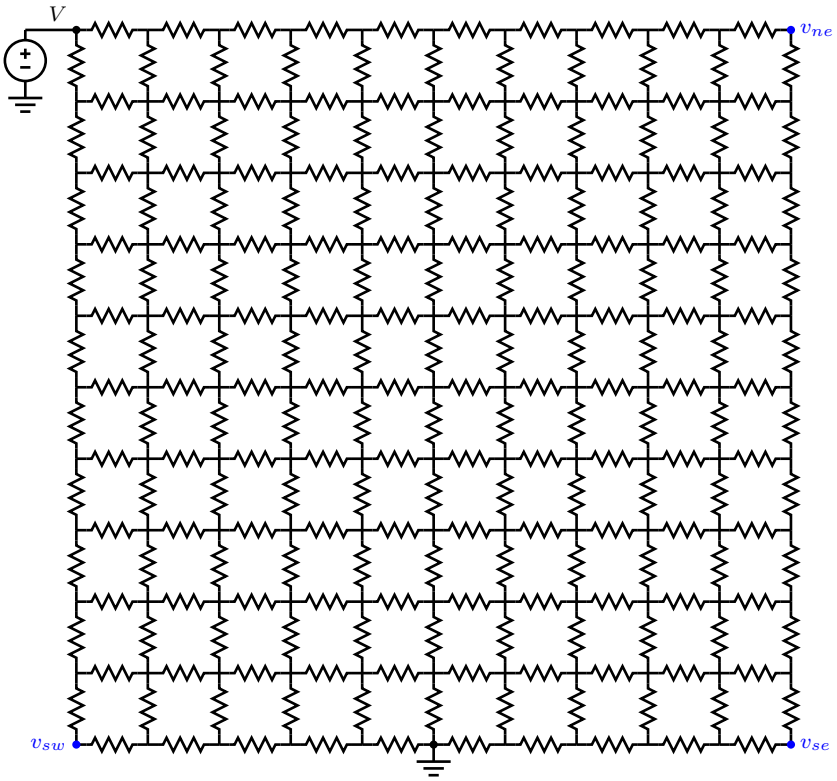
1. Assuming each resistor is 1 KΩ and the voltage, V, is 1 volt, please find the equivalent resistance of the network and the three voltage values, v_{ne}, v_{sw} and v_{se}.



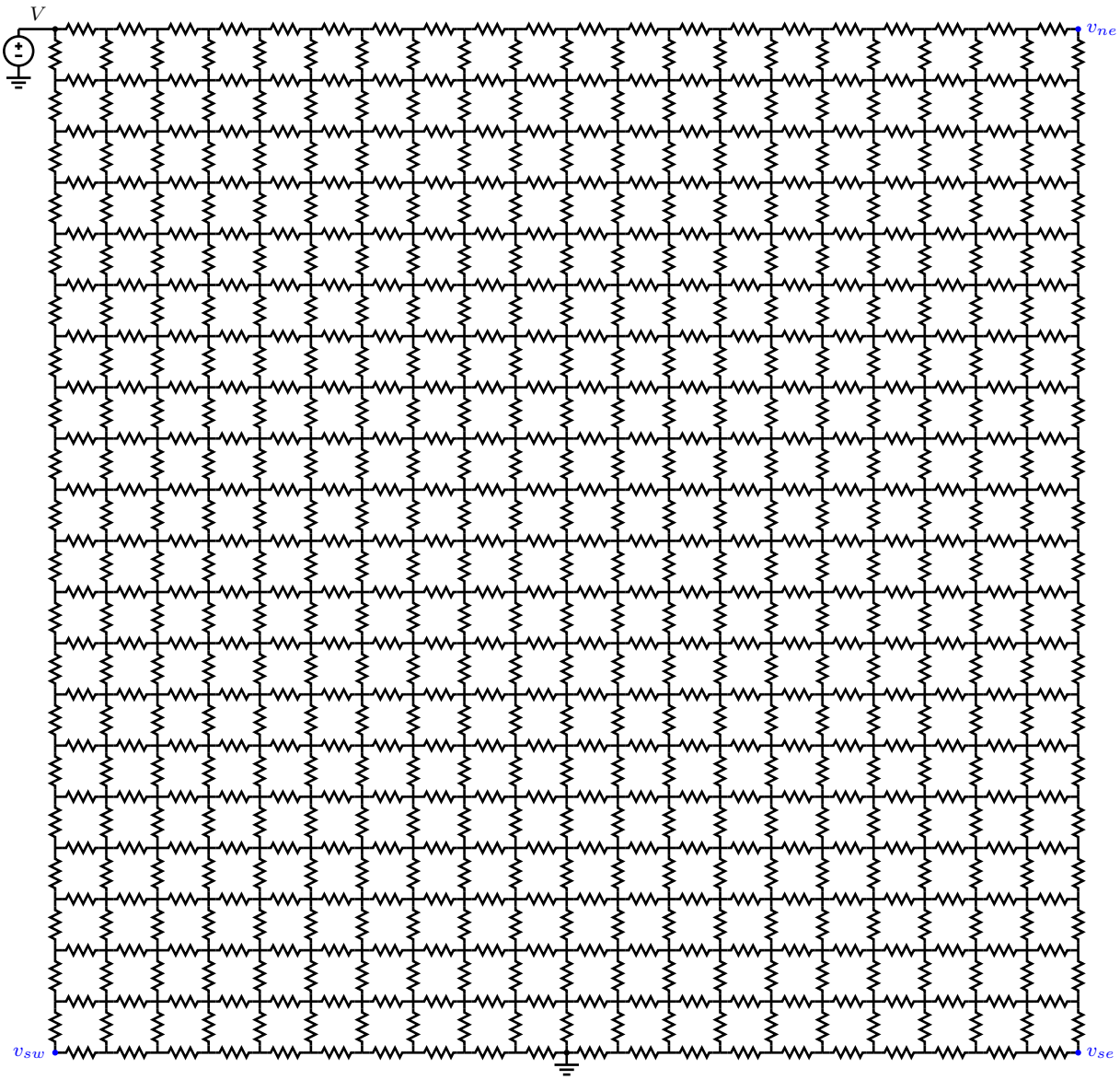
2. Assuming each resistor is 500 Ω and the voltage, V, is 1 volt, please find the equivalent resistance of the network and the three voltage values, v_{ne}, v_{sw} and v_{se}.



3. Assuming each resistor is 200 Ω and the voltage, V, is 1 volt, please find the equivalent resistance of the network and the three voltage values, v_{ne}, v_{sw} and v_{se}.



4. Assuming each resistor is 100 Ω and the voltage, V, is 1 volt, please find the equivalent resistance of the network and the three voltage values, v_{ne}, v_{sw} and v_{se}.



5. Please state your observations after solving all four questions.

Notes.

1. For this homework you need to turn in a C++ program that solves the resistor network problem for question 4. If you program is parametrized then it can solve for all 4 problems using command line arguments. For example,

   ```
   $ ./a.out 10
   ```

   to solve question 3 that each linear dimension has 10 resistors. If your program is not parametrized, then turn in the one that solves question 4. Name your program `hw04.cpp`.

2. A `pdf` file is also needed. Please name this file `hw04a.pdf`.

3. Submit your files on EE workstations. Please use the following command to submit your homework 4.

   ```
   $ ~ee407002/bin/submit hw04 hw04a.pdf hw04.cpp MAT.h MAT.cpp VEC.h VEC.cpp
   ```

   where `hw04` indicates homework 4.

4. Your report should be clearly written such that I can understand it. The writing, including English grammar, is part of the grading criteria.