James Muoghalu
EECS 718
15 March 2018

EECS 718- Extra Credit Homework Assignment

Structure and Organization

- **main.cpp**
  - This class handles the user interaction and most of the screen output. Users must provide the numerical sequence(s) in a file that they will specify at runtime.

- **Hakimi.h** and **Hakimi.cpp**
  - The Hakimi class will run the algorithm on the sorted sequence and determine if the final sequence reduction is, in fact, a graphical sequence. Sequences are stored in C++ vectors and are sorted using the Quicksort algorithm.

I/O Formats

- The user will provide a number of character sequences in a file that will be read in at runtime.
- Each sequence in the file should be contained within a single line.
- Valid numerical sequences will be displayed in sorted order to the user followed by a single sentence stating whether they are graphical.
- Invalid input sequences will display an error message to the user, and the program will move on to the rest of the file.

Instructions for Running Program

1. Navigate into the **source** folder. Type **make** to compile the program. Run the program by typing **./hakimi** .

2. A two-option menu will appear and will ask the user for their decision on running the program with input files. Type either the number **1** to supply the input file or the number **2** to end the program.

3. After typing **1**, provide the name of the data file.
   a. **Make sure the file is located within the source directory, and supply the file extension along with the name.**
   b. Valid sequences contain only non-negative integers separated by spaces.

Terminating Conditions-

- The algorithm runs in a while loop that will terminate when the next possible reduction contains all zeroes.
- Once this while loop has terminated, the program will determine whether the sum of the values in the most recent reduction is an even number.
- The program will also make sure that the largest degree value is less than the order of the graph. This will also be checked after the input sequence has been supplied.
- User input will be read into the program in string form and analyzed character by character. If there is any character that is not whitespace or a numerical digit, the program will register this as an error and move on to the next line in the input file.