Project 01 README bogosort

1	Team Name: bogosort
2	Team members names and netids: Danny Mendler (dmendler)
3	Overall project attempted, with sub-projects: Hamiltonian Circuit
4	Overall success of the project: Much success
5	Approximately total time (in hours) to complete: 6 hours
6	Link to github repository: https://github.com/dmendler/bogosort
7	List of included files (if you have many files of a certain type, such as test files of different sizes, list just the folder): (Add more rows as necessary). Add more rows as necessary.

File/folder Name	File Contents and Use
Code Files	
run_test.sh	Runs test cases and outputs to output files
ham_circuit_bogosort.py	Functions to find a hamiltonian circuit if there is one, as well as driver code to read in a test case
Test Files	
test_cases	Test cases for hamiltonian circuits
data_files	Data files for graphs
Output Files	
output_files	Output files from ham_circuit_bogosort.py (output file number correlates to data file number)
Plots (as needed)	

	<table><tr><td>plots_bogosort.pdf</td><td>This shows the plot of the time to compute the hamiltonian path vs the number of vertices (size)</td></tr></table>
8	Programming languages used, and associated libraries: Python: collections, time, csv, sys Bash: no libraries
9	Key data structures (for each sub-project): Dictionaries, sets, lists
10	General operation of code (for each subproject): Starts timer to read in graph, reads in csv file into a graph (dict[int, set[int]) where it maps a vertex to other vertices it is connected to (its edges), ends timer to read in graph, starts timer to compute hamiltonian circuit, finds a hamiltonian circuit if it exists, stops timer to compute hamiltonian circuit, prints results.
11	What test cases you used/added, why you used them, what did they tell you about the correctness of your code. I created multiple test cases by drawing graphs with or without hamiltonian circuits to verify its correctness and used those test cases to verify the correctness of the code. Since I drew the graphs and manually found the hamiltonian circuits, I checked the circuits with the circuits I found which also verified the correctness of the code. Some of the test cases include a case where there is a hamiltonian path but not a hamiltonian circuit, as well as a large test case to verify the code works with different sizes of graphs.
12	How you managed the code development: I did all the code by myself
13	Detailed discussion of results: The results print out the hamiltonian circuit if it exists, as well as the time to read in the graph and the time to compute the circuit. All of the times correlated to the size of the test cases and the circuits were accurate to the results I found manually. As the size of the files increase, the time it takes to compute the hamiltonian circuit increases.
14	How team was organized: I was the only team member
15	What you might do differently if you did the project again: I would change the code so the user can determine if they want to find a hamiltonian circuit or an euler circuit. This can be done by creating a different function called find_euler_circuit and it would check in the input file if the user wants to find a hamiltonian or euler circuit.
16	Any additional material: