CS310 Algorithms
Project 2 Graph
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Group Members Responsibilities
Shana-Create DFS to traverse graph and check if cyclic
Ahsan-Create ADT for undirected graph and code for input file to be converted to graph
Eli-Create ADT for undirected graph and code for input file to be converted to graph
Chau-Create DFS to traverse graph and check if cyclic

Design of Project
GitHub: https://github.com/phqchau/algorithm_graph
Diagram:

Vertex

attributes:

- __cityName - name of the city
- __cityValue - int used for indexing

methods:

cityName(self) - returns the name of the vertex's city

get_val(self) - returns the index value

changeName(self, newName) - sets name to newName

firstEdge(self, theGraph) - returns the 1st edge in the vertex's adjacency list

addEdge(self, theGraph, newEdge) - adds newEdge to the adjacency list

Graph

attributes:

- __cities - an orderedDict (keys: cities, values: linked lists of edges)
- __count - int representing # of cities

methods:

_validate_vertex(self, v) - ensures the given vertex is valid & in the graph

get_edge(u, v) - returns the edge between vertices u and v, or None if not connected

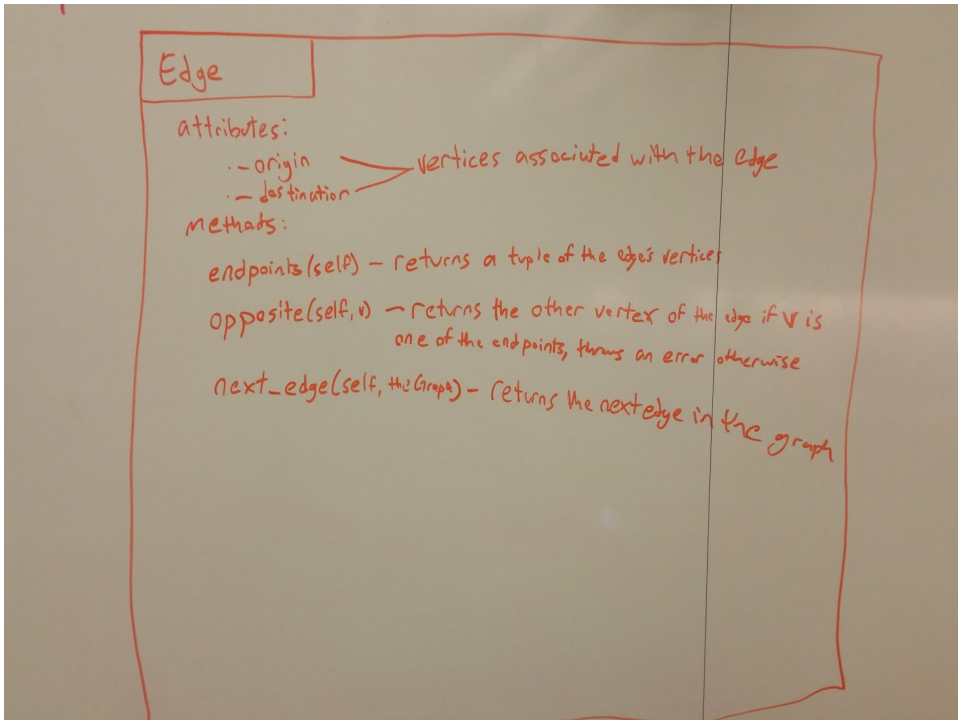
insert_vertex(self, x) - inserts and returns a vertex with value x, returns the vertex if it already exists

insert_edge(u, v) - inserts an edge between vertices u and v

searchCity(self, cityName) - adds a vertex with attribute cityName if it doesn't already exist returns the index of the vertex regardless

Class edge

Class vertex



State what has been finished and what hasn't been finished
Finished:
The ADT
Driver program creates graph to be traversed from input file, uses DFS to traverse the graph and return connected components, and whether or not the graph is cyclic.

One problem that occurred was that in the input file graphMed2.in, Green_Bay,WI was set to connect to itself multiple lines in a row. This slowed down the DFS, however after running the code, when pushing control-C, the output printed.

Future Work
Code could be cleaner and more efficient. Comments aren't perfectly clear, could use some clarification. We printed the output to the console rather than creating an output file. Future work would be creating this output file.