



Visualizing Graph Algorithms

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Project Journey / Description

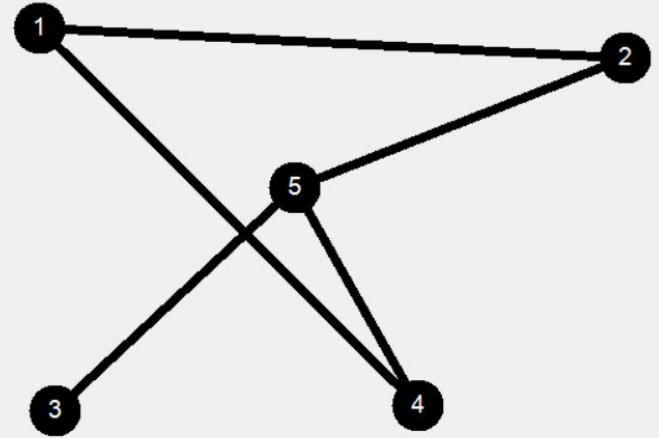
- Designed for Students to Help w/ Learning
- Develop Desktop App. in C#



**Windows
Forms C#**

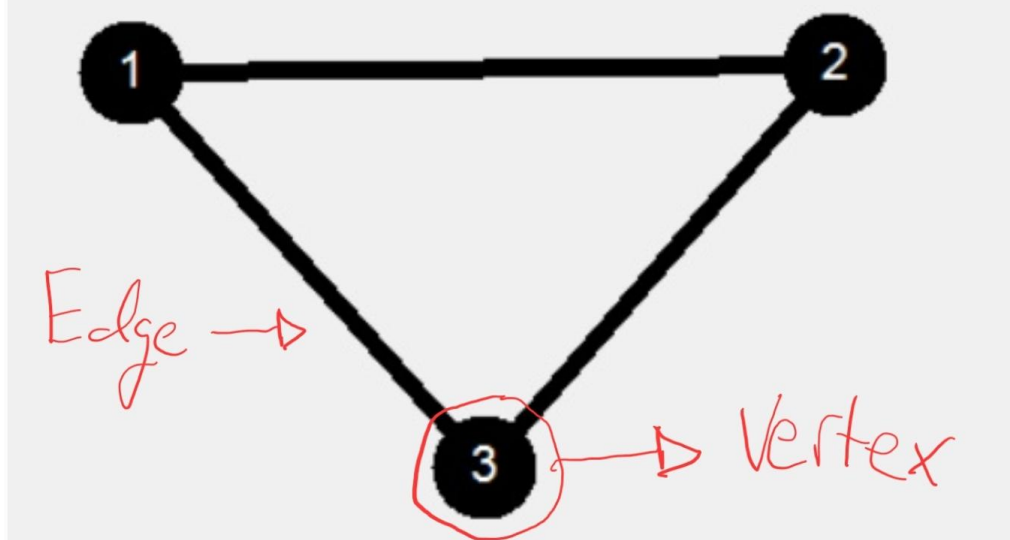
**Visual Studio
2022 for .NET
WinForms**

- Allows users to create custom graphs

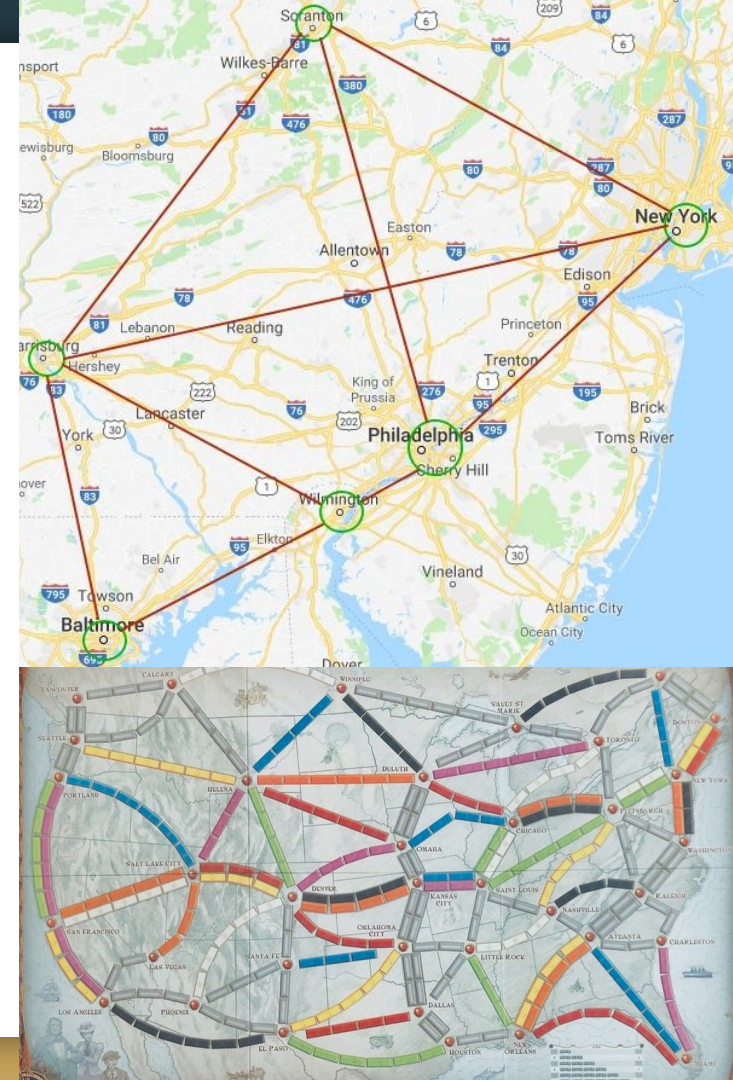


What is a Graph?

- Collection of points (vertices) connected by lines (edges)



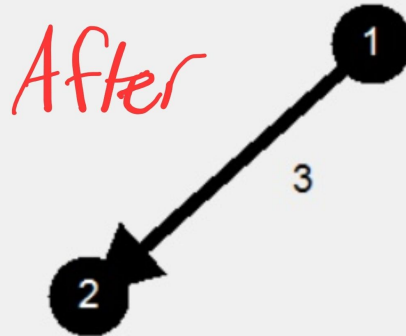
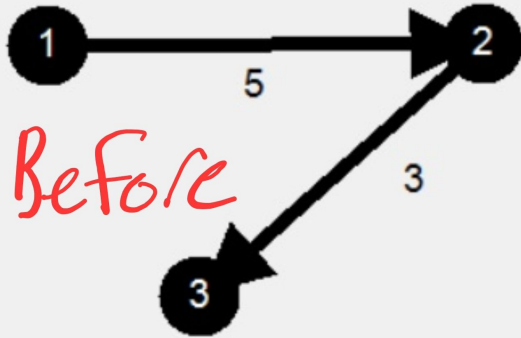
- Modal networks: maps, relationships, data flow, etc



Project Requirements

- Graph Creation

- Add / Delete Vertices and Edges
- Allow Directed and Undirected, Weighted and Unweighted Edges
- Drag Vertices
- Provide a view of the underlying data structure



- Save and Upload Graphs

The graph is: Undirected and Unweighted and has 11 vertices.

Screen Size: 1138, 711

V1, 549, 296

V2, 212, 412

V3, 79, 558

V4, 331, 547

V5, 593, 471

V6, 917, 315

V7, 931, 477

V8, 649, 632

V9, 1062, 638

V10, 287, 106

V11, 801, 123

0,1,0,0,0,1,0,0,0,1,1

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Project Requirements Continued

- Algorithm Implementation
 - Depth First Search with edge classification
 - Minimum Spanning Tree (Prim or Kruskal)
 - Shortest Path Algorithms (Dijkstra or Warshall)
 - Connected or Bi-Connected Components
 - Student/Faculty Option



AlgorithmSelection

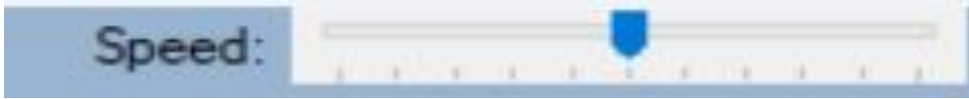
Depth First Search

Dijkstra Shortest Path

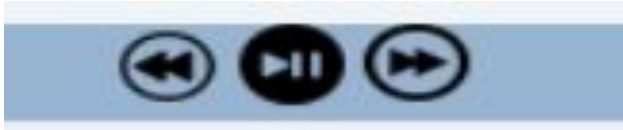
Project Requirements Continued

- Visualization

- User Can Set Speed of Animation



- User Can Step Through Animation

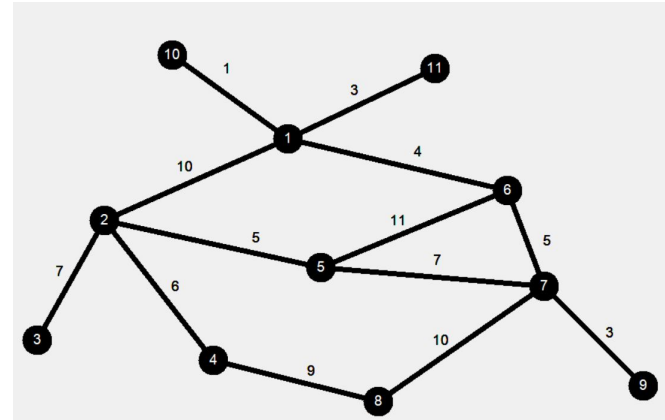


- User Can Specify Starting Vertex

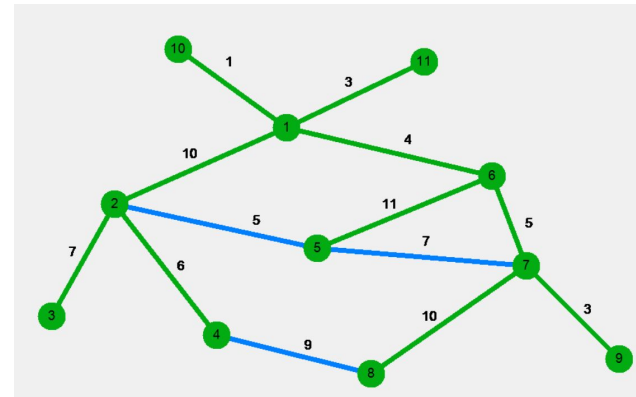


- User Can Restart the Algorithm.
- Provide Appropriate Annotations for Algorithm
- Interface Remains Informative

Default / Starting Graph

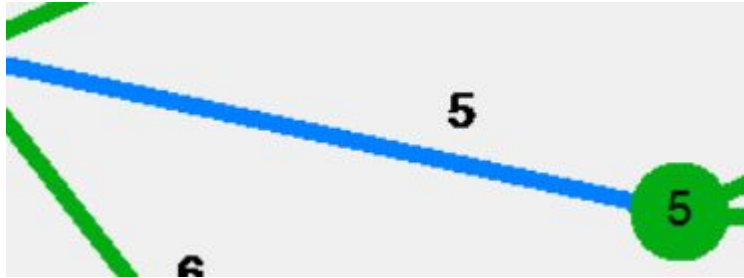


Finished Graph



Demonstration

Back Edge / No Longer Considering



UNVISITED / Considering



DONE



VISITED



Learning Strategies

- Helpful Sources
 - Stack Overflow
 - Learn Microsoft
 - CSCI 350 Labs / Dr. McVey
- Helpful Strategies
 - Having specific days and times blocked off
 - Creating new files
 - DOCUMENTATION

Extensions: Next Senior to Take Over

- Enhance:
 - The drawing for graph design
 - The steps of algorithm
- Extend
 - Implement other algorithms
 - Implement rewind button

Questions