Homework 14 - graphy mcgraphs

Prof Bill - Mar 2020

Due: **Mon Apr 13, 2020**

Waggle your notes/answers in Zoom class on Monday. thanks...yow, bill

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A. Terms

Please write (or type) the definition of the following graph-y terms. I'll Zoom-pepper you in class. Sedgewick help: algs4.cs.princeton.edu/40graphs

- adjacent vertices, edges incident on vertices
- self-loop, parallel edges
- vertex degree

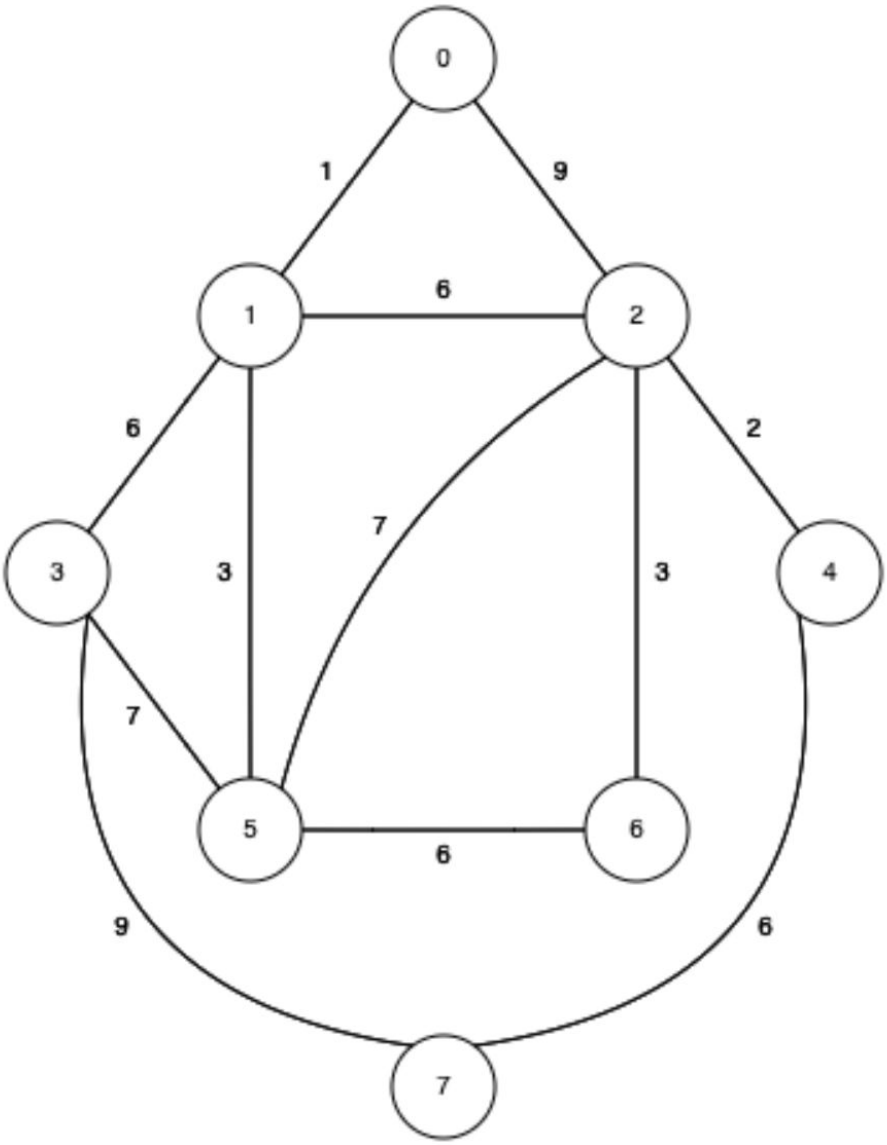
- path, simple path
- cycle, simple cycle
- path/cycle length
- connected vertices, connected graph
- acyclic graph

- tree, forest
- spanning tree
- bipartite graph

- digraph
- vertex in-degree, out-degree
- DAG

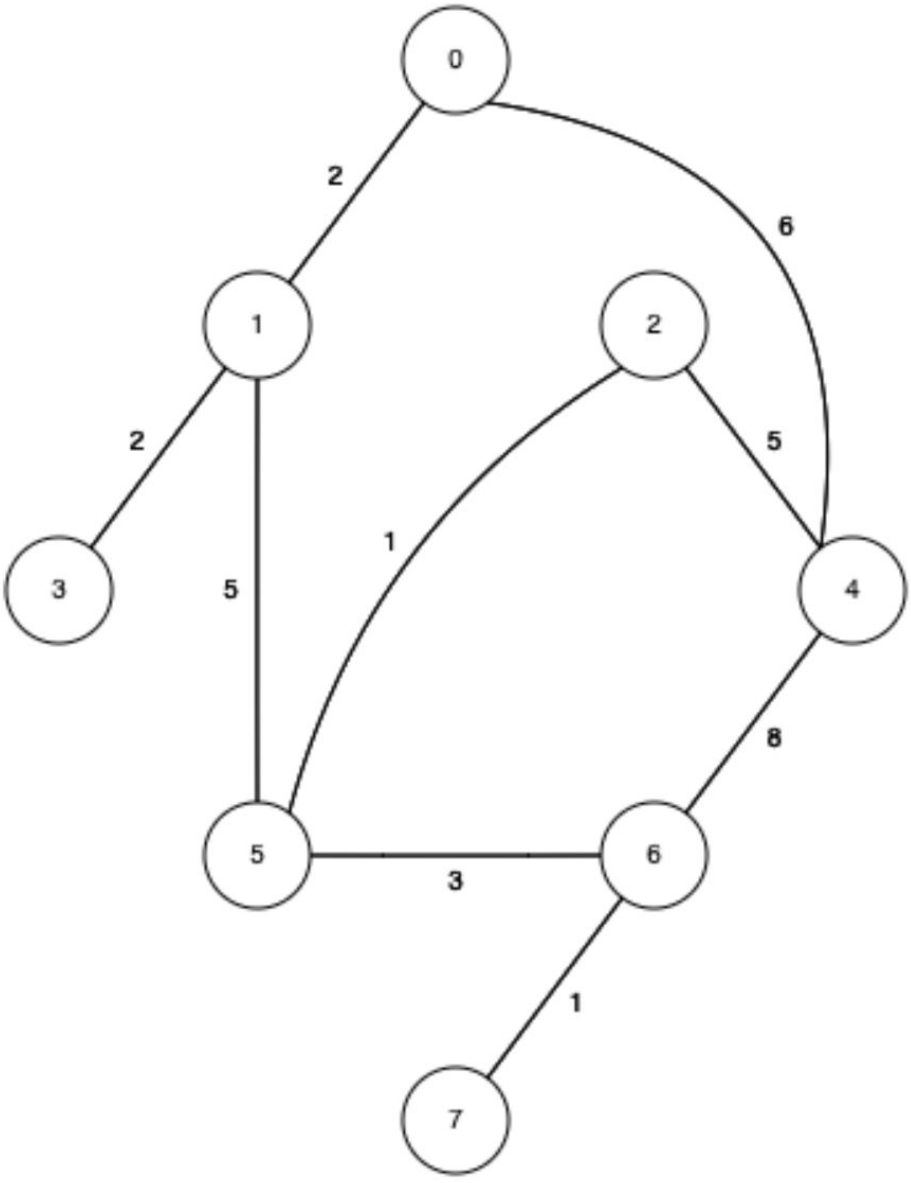
B. Dijkstra's shortest path algorithm

Run Dijkstra's to determine the shortest path(s) on the example below. Start at vert 0. Update Cost and Path arrays for each vertex.
Animation help: www.cs.usfca.edu/~galles/visualization/Dijkstra.html



C. Prim's min spanning tree algorithm

Run Prim's to determine the min spanning tree on the example below. Start at vert 0.
Update Known, Cost, and Path arrays for each vertex.
Animation help: www.cs.usfca.edu/~galles/visualization/Prim.html



Happy holiday weekend! thanks...yow, bill

Solutions

B. Dijkstra solution

Vertex	Known	Cost	Path	
0	T	0	-1	0
1	T	1	0	0 1
2	T	7	1	0 1 2
3	T	7	1	0 1 3
4	T	9	2	0 1 2 4
5	T	4	1	0 1 5
6	T	10	5	0 1 5 6
7	T	15	4	0 1 2 4 7

C. Prim's solution

Vertex	Known	Cost	Path
0	T	0	-1
1	T	2	0
2	T	1	5
3	T	2	1
4	T	5	2
5	T	5	1
6	T	3	5
7	T	1	6