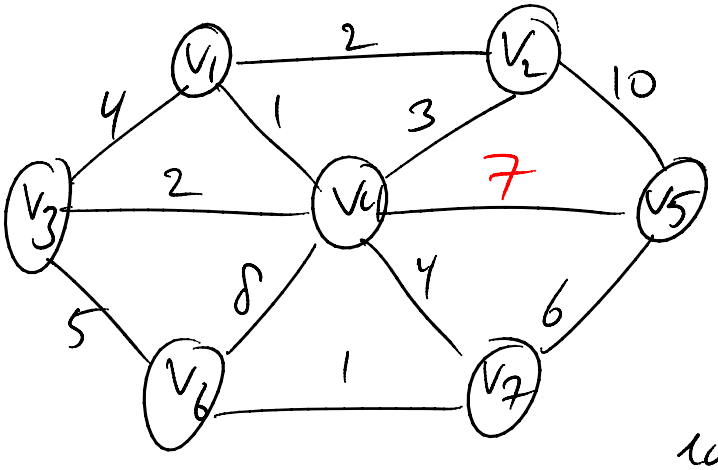
Thursday, October 22, 2009
3:35 PM

Prim's Alg: MST for undirected graphs

- this time, graph is



Note that these edges are undirected

↓

g[v1.id][v2.id] = 2
g[v2.id][v1.id] = 2

each "directed" arc is entered once (two arcs per edge)

- Prim's is identical to Dijkstra's except for

gue.push(Node(Node.id, adjacent_node.id, (predecessor)
~~node.cost~~ + adjacent_node.cost))

setup	cost	path	gue
v_1			$(v_1,0)_{v_1}$
v_2			
v_3			
v_4			
v_5			
v_6			
v_7			

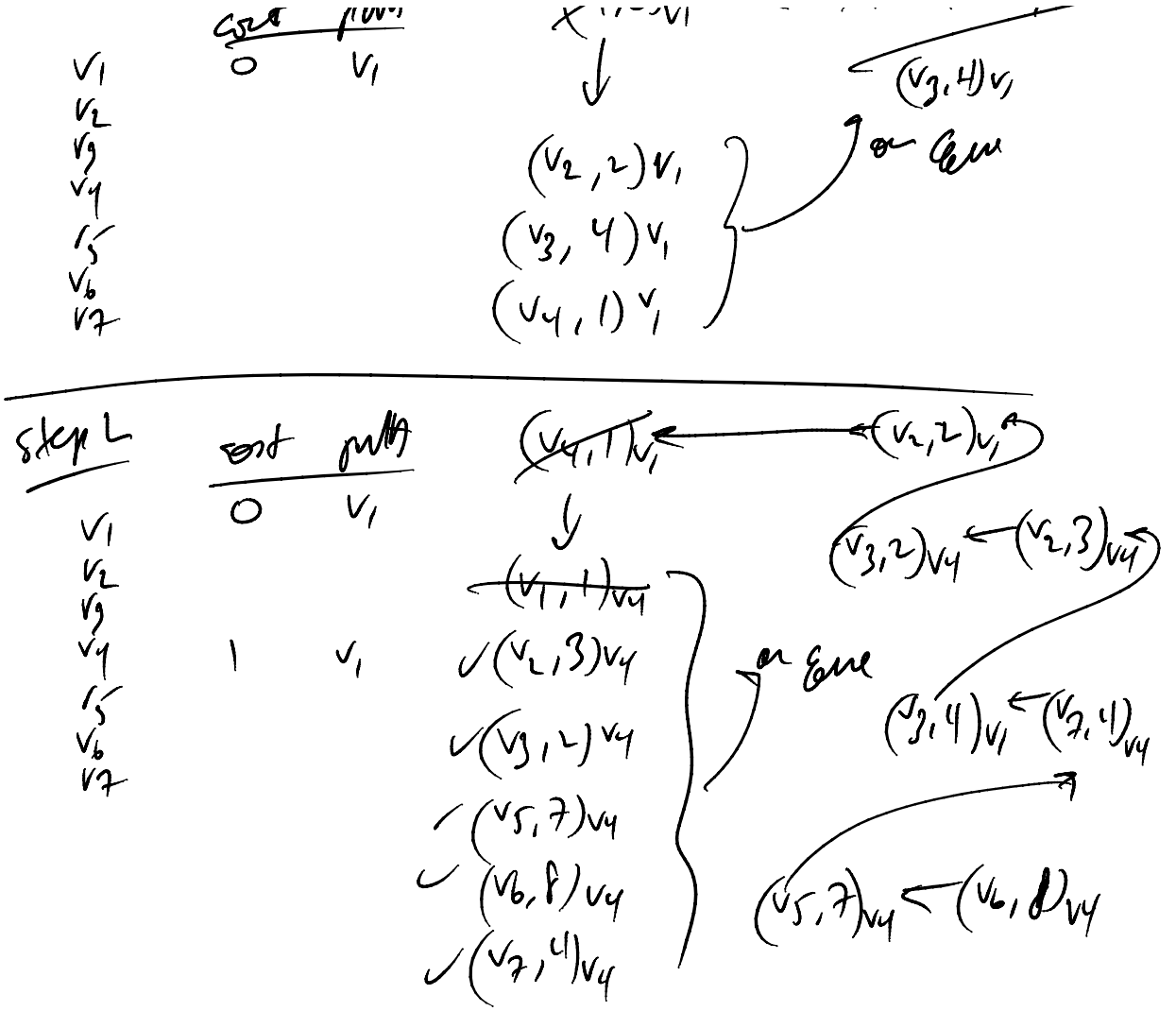
---

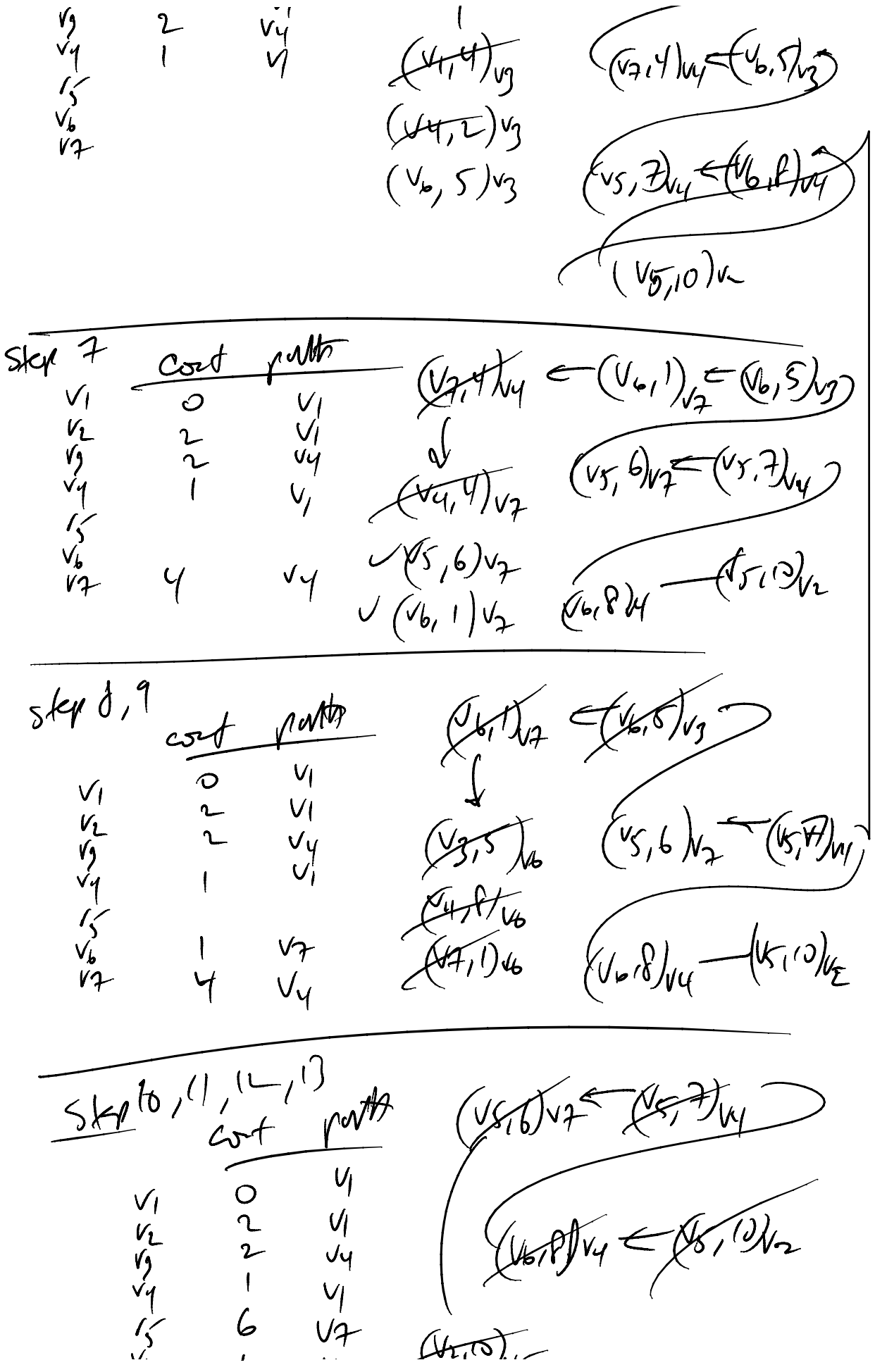
step 1

	cost	path
v_1	0	v_1

~~$(v_1,0)_{v_1}$~~ ← $(v_4,1)_{v_1}$ ← $(v_2,2)_{v_4}$ ← $(v_3,4)_{v_1}$

↓


Step 2
Step 3
Step 4/5, 6
or Else
or Else


v3 2 v4
v4 1 v1
v5
v6
v7
1
(v4,4)v3
(v4,2)v3
(v6,5)v3
(v7,4)v4 ← (v6,5)v3
(v5,7)v4 ← (v6,8)v4
(v5,10)v2
step 7
cost path
v1 0 v1
v2 2 v1
v3 2 v4
v4 1 v1
v5
v6
v7 4 v4
(v7,4)v4 ← (v6,1)v7 ← (v6,5)v3
(v4,4)v7
(v5,6)v7
(v6,1)v7
(v5,6)v7 ← (v5,7)v4
(v6,8)v4 — (v5,10)v2
step 8,9
cost path
v1 0 v1
v2 2 v1
v3 2 v4
v4 1 v1
v5
v6 1 v7
v7 4 v4
(v6,1)v7 ← (v6,5)v3
(v3,5)v6
(v4,4)v6
(v7,1)v6
(v5,6)v2 ← (v5,7)v4
(v6,8)v4 — (v5,10)v2
step 10,11,12,13
cost path
v1 0 v1
v2 2 v1
v3 2 v4
v4 1 v1
v5 6 v7
(v5,6)v7 ← (v5,7)v4
(v6,8)v4 ← (v5,10)v2
(v2,10)...

v_1	0	v_1
v_2	2	v_1
v_3	2	v_4
v_4	1	v_1
v_5	6	v_7
v_6	1	v_7
v_7	4	v_4

~~$(v_6, 8) v_4 \leftarrow (v_5, 10) v_2$~~

~~$(v_2, 10) v_5$~~

~~$(v_4, 7) v_5$~~

~~$(v_7, 6) v_5$~~