Distributed Systems Assignment

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2.1

Proof: If V is a vector clock, prove that $a \to b \iff V(a) \leq V(b)$.

$a \to b \implies V(a) \leq V(b)$

There are three possibilities:

1. Event b was a local event of a process i, by definition $V(b)[i] += V(b)[i] + 1$
2. Event b was a send message event of a process i.
3. Event b was a receive message event of a process i.

$V(a) \leq V(b) \implies a \to b$

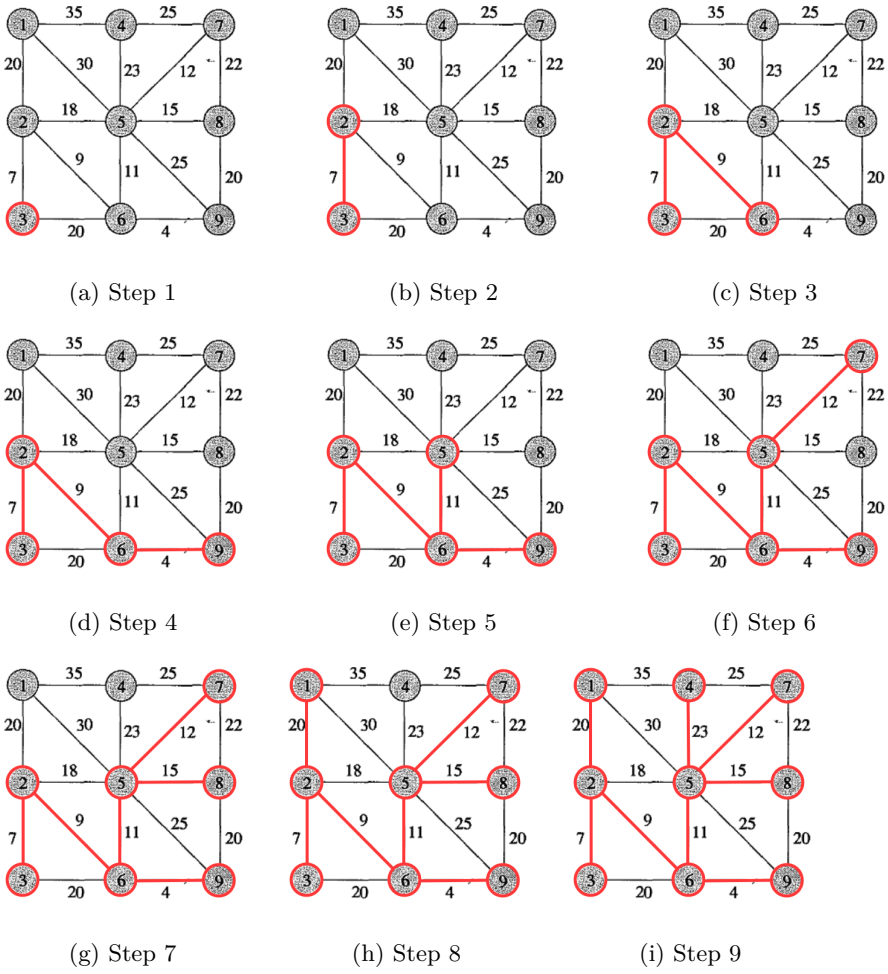
2.2

2.3

The weighted diameter of this graph is 7. The path realising this diameter is $A \to C \to E \to G \to H$.

If the graph was unweighted, the diameter would be 4 and the corresponding path would be $A \to C \to F \to G \to I$.

2.4



(a) Step 1 (b) Step 2 (c) Step 3

(d) Step 4 (e) Step 5 (f) Step 6

(g) Step 7 (h) Step 8 (i) Step 9

Figure 1: Prim's algorithm