

CS 32 WFW

Long Exam 2

August 28, 2013

General Instructions

- Answer the items completely. Show your solutions/justifications when asked.
- Write as legibly as possible. Illegible or unreadable answers and solutions may not merit any points.
- Refrain from making unnecessary motions and sounds during the exam. Any suspicious behavior will be dealt with accordingly.
- Direct all questions to the proctor.
- If you need to go to the CR, hand your questionnaire, answer sheet, and scratch paper to the proctor before heading out. Only one person at any given time is allowed to go out.
- Once you're done with the exam (one way or the other), place your scratch papers and the questionnaire inside your blue book.

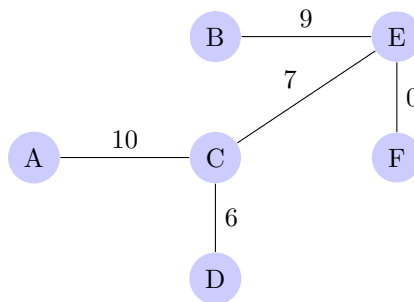
Questions

Consider the following cost adjacency matrix:

	A	B	C	D	E	F
A	0	13	10	20	∞	∞
B	13	0	12	∞	9	13
C	10	12	0	6	7	∞
D	20	∞	6	0	25	14
E	∞	9	7	25	0	0
F	∞	13	∞	14	0	0

1. Using Prim's algorithm, construct the corresponding minimum spanning tree for the graph above. Show the status of the computation at each step.

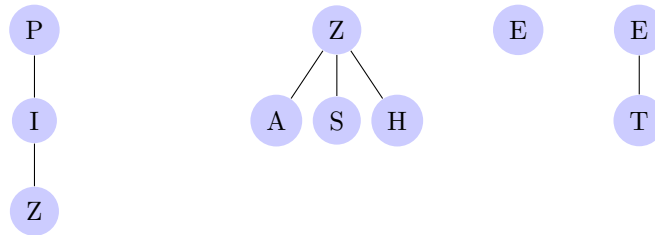
ANSWER:



2. Using Dijkstra's algorithm, show the shortest path from node C to any other node in the graph. Show the status of the computation at each step.

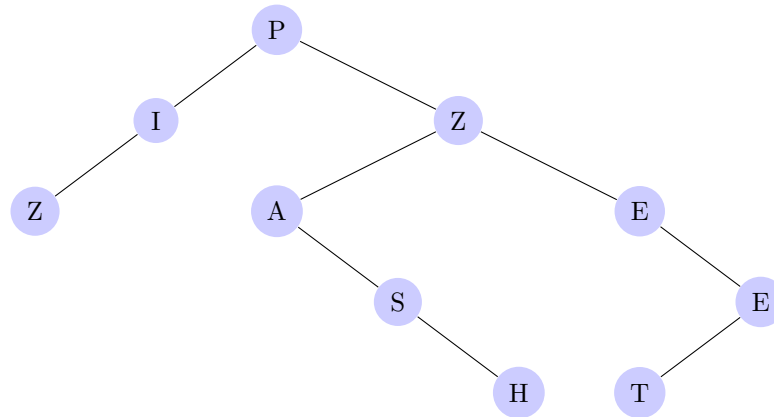
ANSWER: $C \rightarrow A$ ($cost = 10$), $C \rightarrow B$ ($cost = 12$), $C \rightarrow D$ ($cost = 6$), $C \rightarrow E$ ($cost = 7$), $C \rightarrow E \rightarrow F$ ($cost = 7$)

Consider the following forest:



3. Construct the corresponding binary tree of the forest above.

ANSWER:



4. Will *preorder* traversal of the forest and then its corresponding binary tree yield the same order of node visitation? Show the results of each traversal for the forest and binary tree.

ANSWER: Yes. Both: PIZZASHEET

5. Will *postorder* traversal of the forest and then its corresponding binary tree yield the same order of node visitation? Show the results of each traversal for the forest and binary tree.

ANSWER: No. Forest: ZIPASHZETE, Binary Tree: ZIHSATEEZP