

Homework #10 Key

5.2 (a) Prims ordering and partial MST sums

	Edge	Current MST Sum
1	AB	1
2	BC	3
3	CG	5
4	GD	6
5	GF	7
6	GH	8
7	AE	12

5.2 (b) A Kruskal ordering:

AB

DG

FG

GH

BC

CG

AE

Set Data Structure: You could show this as a picture of the tree. We show the array after legally added edge as shown above.

Initial Array:

Node	$\pi(x)$	Rank(x)
A	A	0
B	B	0
C	C	0
D	D	0
E	E	0
F	F	0
G	G	0
H	H	0

After adding edge AB:

Node	$\pi(x)$	Rank(x)
A	A	1
B	A	0
C	C	0
D	D	0
E	E	0
F	F	0
G	G	0

H	H	0
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After adding edge DG:

Node	$\pi(x)$	Rank(x)
A	A	1
B	A	0
C	C	0
D	D	1
E	E	0
F	F	0
G	D	0
H	H	0

After adding edge FG:

Node	$\pi(x)$	Rank(x)
A	A	1
B	A	0
C	C	0
D	D	1
E	E	0
F	D	0
G	D	0
H	H	0

After adding edge GH:

Node	$\pi(x)$	Rank(x)
A	A	1
B	A	0
C	C	0
D	D	1
E	E	0
F	D	0
G	D	0
H	D	0

After adding edge BC:

Node	$\pi(x)$	Rank(x)
A	A	1
B	A	0
C	A	0
D	D	1
E	E	0
F	D	0
G	D	0

H	D	0
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After adding edge CG:

Node	$\pi(x)$	Rank(x)
A	A	2
B	A	0
C	A	0
D	A	1
E	E	0
F	D	0
G	D	0
H	D	0

After adding edge AE:

Node	$\pi(x)$	Rank(x)
A	A	2
B	A	0
C	A	0
D	A	1
E	A	0
F	D	0
G	D	0
H	D	0