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Homework 6

1.

Prefix match	Interface	Host address range	# of addresses
`10`	0	`1000 0000 — 1011 1111`	2^6
`100`	1	`1000 0000 — 1001 1111`	2^5
`111 && 00`	2	`1110 0000 — 1111 1111 && 0000 0000 — 0011 1111`	$2^5 + 2^6$
`01`	3	`0100 0000 — 0111 1111`	2^6

2.
Subnet prefix: `223.1.24.128/24`
`223.1.24.64/26` – supports 64 interfaces (min. 50)
`223.1.24.16/28` – supports 16 interfaces (min. 12)
`223.1.24.128/25` – supports 128 interfaces (min. 100)

3a.
Router address: 124.25.130.20
Home network address: 192.168.1/24
Subnet addresses for 3 interfaces (as per Figure 4.22)

Interface	Subnet address
1	`192.168.1.1`
2	`192.189.1.2`
3	`192.168.1.3`
4 (router)	`192.168.1.4`

3b.

NAT translation table	
WAN side	LAN side
`124.25.130.20, 5000`	`192.168.1.1, 3345`
`124.25.130.20, 5001`	`192.168.1.1, 3346`
`124.25.130.20, 5002`	`192.168.1.2, 3445`
`124.25.130.20, 5003`	`192.168.1.2, 3446`
`124.25.130.20, 5004`	`192.168.1.3, 3545`
`124.25.130.20, 5005`	`192.168.1.3, 3546`

3. (computer lab IP address question)
Lab computers have a private IP address.
Public IP: `150.108.68.33` ← router that performs the NAT translation

4.

	D(t)	D(u)	D(v)	D(w)	D(y)	D(z)
x	∞	∞	6,x	3,x	6,x	8,x
xw	8,u	6,w	6,x		6,x	8,x
xwu	8,u		6,x		6,x	8,x
xwuv	8,u				6,x	8,x
xwuvy	8,u					8,x
xwuvyz						
xwuvyzt						

6. (x,y)=2, c(y,z)=3, c(z,x)=6

X	x	y	z
x	0	2	6
y	∞	∞	∞
z	∞	∞	∞

X	x	y	z
x	0	2	5
y	2	0	3
z	6	3	0

X	x	y	z
x	0	2	5
y	2	0	3
z	5	3	0

Y	x	y	z
x	∞	∞	∞
y	2	0	3
z	∞	∞	∞

Y	x	y	z
x	0	2	6
y	2	0	3
z	6	3	0

Y	x	y	z
x	0	2	5
y	2	0	3
z	5	3	0

Z	x	y	z
x	∞	∞	∞
y	∞	∞	∞
z	6	3	0

Z	x	y	z
x	0	2	6
y	2	0	3
z	5	3	0

Z	x	y	z
x	0	2	5
y	2	0	3
z	5	3	0