Introduction to Networks and Distributed Computing
CECS 327
Spring 2021
Due Date: Wednesday, March 24, 2021 @ 10:00 PM PST

Assignment 3: Subnetting

Instructions For all problems:

- This is a team assignment
- Use the Subnetting Worksheet to show and record all work for each problem.
- The all 0's subnet is a usable subnet and the all 1's subnet is not a usable subnet.

Problem 1

Host IP Address	172.30.1.33
Major Network Mask	255.255.0.0
Major (Base) Network Address	172.30.0.0
Major Network Broadcast Address	172.30.255.255
Total Number of Host Bits	16
Number of Hosts	65534
Subnet Mask	255.255.255.0
Number of Subnet Bits Number of Usable Subnets (zero subnet used)	24
Number of Host Bits per Subnet Number of Usable Hosts per Subnet	8 254
Subnet Address for this IP Address	172.30.1.0
IP Address of First Host on this Subnet	172.30.1.1
IP Address of Last Host on this Subnet	172.30.1.254
Broadcast Address for this Subnet	172.30.1.255

Problem 2

Host IP Address	172.30.1.33
Major Network Mask	255.255.255.0
Major (Base) Network Address	172.30.1.0
Major Network Broadcast Address	172.30.1.255
Total Number of Host Bits	8
Number of Hosts	= 254
Subnet Mask	255.255.255.252
Number of Subnet Bits Number of Usable Subnets (zero subnet used)	30
Number of Host Bits per Subnet Number of Usable Hosts per Subnet	2 2
Subnet Address for this IP Address	172.30.1.32
IP Address of First Host on this Subnet	172.30.1.33
IP Address of Last Host on this Subnet	172.30.1.34
Broadcast Address for this Subnet	172.30.1.35

Problem 3

Host IP Address	192.192.10.234
Major Network Mask	255.255.255.0
Major (Base) Network Address	192.192.10.0
Major Network Broadcast Address	192.192.10.255
Total Number of Host Bits	8
Number of Hosts	~~256~~ $2^8 - 2 = 256 - 2 = 254$
Subnet Mask	255.255.255.248
Number of Subnet Bits	29
Number of Usable Subnets (zero subnet used)	
Number of Host Bits per Subnet	3
Number of Usable Hosts per Subnet	6
Subnet Address for this IP Address	192.192.10.232
IP Address of First Host on this Subnet	192.192.10.233
IP Address of Last Host on this Subnet	192.192.10.238
Broadcast Address for this Subnet	192.192.10.239

Problem 4

Host IP Address	171.68.99.71	
Major Network Mask	255.255.0.0	
Major (Base) Network Address	171.68.0.0	✓
Major Network Broadcast Address	171.68.255.255	✓
Total Number of Host Bits	16	
Number of Hosts	$65536 - 2 = 65534$ hosts	
Subnet Mask	255.255.240.0	
Number of Subnet Bits	20	
Number of Usable Subnets (zero subnet used)	16	✓
Number of Host Bits per Subnet	$4 + 8 = 12$	✓
Number of Usable Hosts per Subnet	$4096 - 2 = 4094$	✓
Subnet Address for this IP Address	171.68.96.0 ✓	
IP Address of First Host on this Subnet	~~171.68.96~~ 171.68.96.1	
IP Address of Last Host on this Subnet	171.68.111.254	
Broadcast Address for this Subnet	171.68.111.255 ✓	

Problem 5

Host IP Address	217.200.3.219
Major Network Mask	255.255.255.0
Major (Base) Network Address	217. 200 · 3. 0
Major Network Broadcast Address	217. 200 · 3 · 255
Total Number of Host Bits	8
Number of Hosts	$2^8 \cdot 2 = $ 254
Subnet Mask	255.255.255.224
Number of Subnet Bits	27
Number of Usable Subnets (zero subnet used)	
Number of Host Bits per Subnet	5
Number of Usable Hosts per Subnet	~~~~ 30
Subnet Address for this IP Address	217.200.3.192
IP Address of First Host on this Subnet	217. 200. 3.193
IP Address of Last Host on this Subnet	217.200.3.222
Broadcast Address for this Subnet	217.200.3.223