

Problem 7

Number of needed subnets **2000**

Number of needed usable hosts **15**

Network Address **178.100.0.0**

Address class B

Default subnet mask 255.255.0.0

Custom subnet mask 255.255.255.224

Total number of subnets 2048

Total number of host addresses 32

Number of usable addresses 30

Number of bits borrowed 11

Show your work for Problem 7 in the space below.

Number of Hosts	65,536	32,768	16,384	8,192	4,096	2,048	1,024	512	256	128	64	32	16	8	4	2
Number of Subnets	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536
Binary values	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1
178 . 100 . 0 0 0 0 0 0 0 0 . 0 0 0 0 0 0 0 0																

$$128+64+32+16+8+4+2+1 = 255$$

$$128+64+32 = 224 \quad // \text{ To create the custom subset mask}$$

$$\text{Total number of subnets} = 2^s = 2^{11} = 2048$$

//Borrowed 11 bits

Number of hosts are 32

$$\text{Number of Usable addresses} = 32 - 2 = 30$$

Problem 15

Number of needed usable hosts **50**

Network Address **172.59.0.0**

Address class ___ B ___

Default subnet mask _____ 255.255.0.0 _____

Custom subnet mask _____ 255.255.255.192 _____

Total number of subnets _____ 1024 _____

Total number of host addresses _____ 64 _____

Number of usable addresses _____ 62 _____

Number of bits borrowed _____ 10 _____

Work for Problem 15 in the space below.

Problem 15

Network Address 172.59.0.0
Number of usable Hosts 50

Number of Hosts	Number of Subnets	Binary Values
65536	2	128
32768	4	64
16384	8	32
8192	16	16
4096	32	8
2048	64	4
1024	128	2
512	256	1

172.59.0.0 0.0 0.0 0.0

128
64
32
16
8
4
2
+1

255

128
+ 64

192

to get
the
Custom Subnet
mask

Number of subnets = $2^8 = 256$
Number of hosts are = 64
Number of usable addresses = $64 - 2 = 62$

Subnetting

Problem 11

Number of needed usable hosts **8,000**

Network Address **135.70.0.0**

Address class ____B____

Default subnet mask _____255.255.0.0_____

Custom subnet mask _____255.255.224.0_____

Total number of subnets _____8_____

Total number of host addresses _____8192_____

Number of usable addresses _____8190_____

Number of bits borrowed _____3_____

What is the 6th subnet range?

_____135.70.0.160__to__135.70.0.191_____

What is the subnet number for the 7th subnet?

_____135.70.0.192_____

What is the subnet broadcast address for the 3rd subnet?

_____135.70.0.19295_____

What are the assignable addresses for the 5th subnet?

_____135.70.0.161__to__135.70.0.190_____

Problem 11 in the space below.

Number of Subnets needed = 8000
Number of Hosts needed = 8000

Number of Subnets	Number of Hosts	Number of Subnets	Binary Values
2	65536	2	128
4	32768	4	64
8	16384	8	32
16	8192	16	16
32	4096	32	8
64	2048	64	4
128	1024	128	2
256	512	256	1
512	256	512	128
1024	128	1024	64
2048	64	2048	32
4096	32	4096	16
8192	16	8192	8
16384	8	16384	4
32768	4	32768	2
65536	2	65536	1

Network Address: 135.70.0.0

Binary Values: 128, 64, 32, 16, 8, 4, 2, 1

128
64
+ 32
224

Number of Total Hosts = 8192
Number of usable Hosts = 8192 - 2 = 8190

(0) 135.70.0.0 to 135.70.0.31
(1) 135.70.0.32 to 135.70.0.63
(2) 135.70.0.64 to 135.70.0.95
(3) 135.70.0.96 to 135.70.0.127
(4) 135.70.0.128 to 135.70.0.159
(5) 135.70.0.160 to 135.70.0.191
(6) 135.70.0.192 to 135.70.0.223
(7) 135.70.0.224 to 135.70.0.255

Problem 12

Number of needed usable hosts **45**

Network Address **198.125.50.0**

Address class ____ C ____

Default subnet mask _____ 255.255.255.0 _____

Custom subnet mask _____ 255.255.255.192 _____

Total number of subnets _____ 4 _____

Total number of host addresses _____ 64 _____

Number of usable addresses _____ 62 _____

Number of bits borrowed _____ 2 _____

What is the 2nd subnet range?

_____ 198.125.50.64 __ to ____ 198.125.50.127 _____

What is the subnet number for the 2nd subnet?

_____ 198.125.50.64 _____

What is the subnet broadcast address for the 4th subnet?

_____ 198.125.50.255 _____

What are the assignable addresses for the 3rd subnet?

_____ 198.125.50.129 __ to 198.125.50.192 _____

Problem 12 in the space below.

Number of ^{needed} Usable hosts = 45
 Network address: 198.125.50.0

	256	128	64	32	16	8	4	2	Number of Hosts
Number of Subnets	2	4	8	16	32	64	128	256	
Binary Values	128	64	32	16	8	4	2	1	
198.125.50.	0	0	0	0	0	0	0	0	

Get 4th value for custom subnet mask.

$$\begin{array}{r} 128 \\ + 64 \\ \hline 192 \end{array}$$

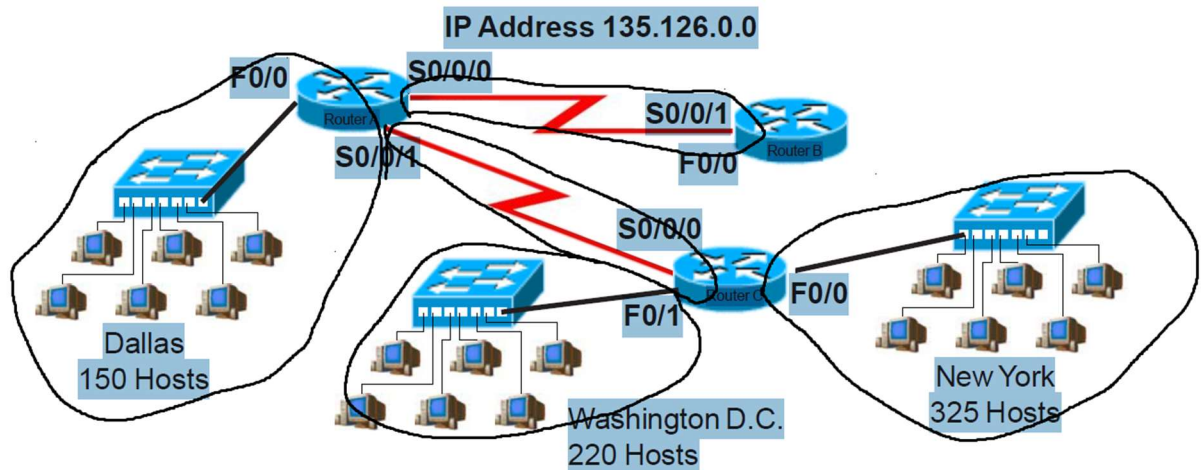
64 host addresses available
 $64 - 2 = 62$ that are usable.

198.125.50.128 (network)
 198.125.50.191 (broadcast)
 255 (gateways) = 128 and 190

	198.125.50.0	to	198.125.50.63
(0)	198.125.50.0	to	198.125.50.63
(1)	198.125.50.64	to	198.125.50.127
(2)	198.125.50.128	to	198.125.50.191
(3)	198.125.50.192	to	198.125.50.255

Practical Subnetting 4

Based on the information in the graphic shown, design a network addressing scheme that will supply the **minimum number of subnets**, and allow enough extra subnets and hosts for 70% growth in all areas. Circle each subnet on the graphic and answer the questions below.



IP Address 135.126.0.0

Address class ____B____

Custom subnet mask _____255.255.255.224_____

Minimum number of subnets needed _____5_____

Extra subnets required for 70% growth _____4_____

Total number of subnets needed _____9_____

Number of host addresses
in the largest subnet group _____325_____

Number of addresses needed for
70% growth in the largest subnet _____228_____

Total number of address
needed for the largest subnet ____553 _____

Start with the first subnet and arrange your sub-networks from the largest group to the smallest.

IP address range for New York __165.100.0.64__ to __165.100.0.127__

IP address range for Washington D. C.

__165.100.0.128__ to __165.100.0.191

IP address range for Dallas _____

IP address range for Router A
to Router B serial connection _____

Number of host addresses
in the largest subnet group _____

IP address range for Router A

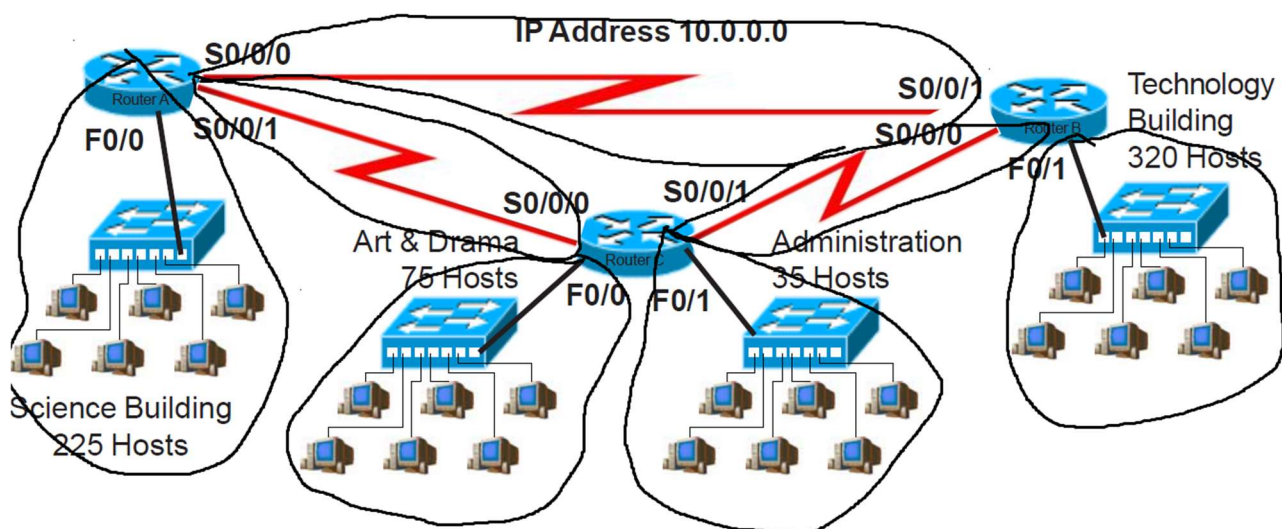
to Router C serial connection_____

Work Done

	65536	32768	16384	8192	4096	2048	1024	512	256	128	64	32	16	8	4	2
Number of Hosts																
Number of Subnets	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536
Binary Val																
Number of Subnets	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1
Binary Values																
135	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 x .7 4 (rounded)	329															
x .7 228 (rounded)	329															
593 (Host)	229															
(0)									165.100.0.0	to	165.100.0.63					
(1)									165.100.0.64	to	165.100.0.127					
(2)									165.100.0.128	to	165.100.0.191					
(3)									165.100.0.192	to	165.100.0.255					
(4)									165.100.1.0	to	165.100.1.63					
(5)									165.100.1.64	to	165.100.1.127					
(6)									165.100.1.128	to	165.100.1.191					
(7)									165.100.1.192	to	165.100.1.255					
(8)									165.100.2.0	to	165.100.2.63					
(9)									165.100.2.64	to	165.100.2.127					
(10)									165.100.2.128	to	165.100.2.191					
(11)									165.100.2.192	to	165.100.2.255					
(12)									165.100.3.0	to	165.100.3.63					
(13)									165.100.3.64	to	165.100.3.127					
(14)									165.100.3.128	to	165.100.3.191					
(15)									165.100.3.192	to	165.100.3.255					

Practical Subnetting 6

Based on the information in the graphic shown, design a network addressing scheme that will supply the **minimum number of subnets**, and allow enough extra subnets and hosts for 20% growth in all areas. Circle each subnet on the graphic and answer the questions below.



IP Address 10.0.0.0

Address class A

Custom subnet mask 255.255.255.224

Minimum number of subnets needed 7

Extra subnets required for 20% growth 1

Total number of subnets needed 8

Start with the first subnet and arrange your sub-networks from the largest group to the smallest.

IP address range for Technology

IP address range for Science

IP address range for Arts & Drama

IP Address range Administration

IP address range for Router A
to Router B serial connection_____

IP address range for Router A
to Router C serial connection_____

IP address range for Router B
to Router C serial connection