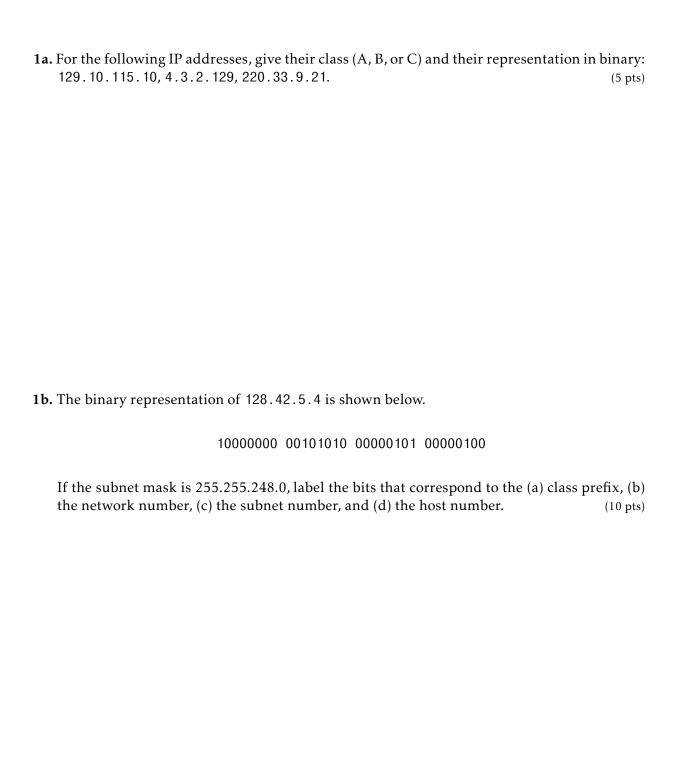
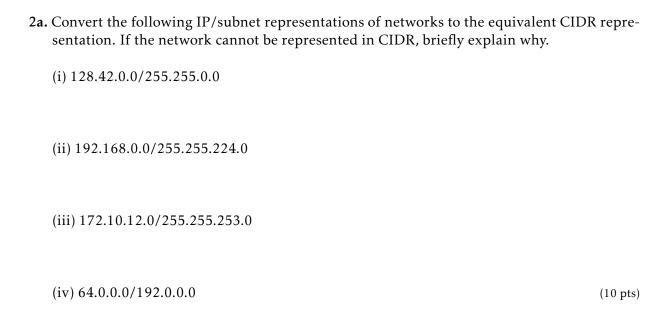
This homework is due at the beginning of class on February 11, 2015 and is worth 1.5% of your grade.

Name: _	
CCIS Username:	

Problem	Possible	Score
1	15	
2	20	
3	25	
4	15	
5	25	
6	10	
Total	110	





2b. Suppose that you have been allocated 173.98.112.0/20, and you wish to divide your address space equally into four parts. What are the CIDR (Classless Interdomain Routing) representations of these four parts? (10 pts)

3a. Consider the following data bits that	at correspond to 2	-byte words:	
	001 1111 0101 (001 1111 1100 (
Compute the Internet Checksum for	r the data.		(10 pts
3b. If the data bits and checksum are tr computed at the receiver assuming	_		
3c. What is the value of the checksum bit of the transmitted data and an ement briefly on the result.			necksum? Com-
ment briefly on the result.			(5 pts
3d What is the value of the checksum c	omputed at the re	ceiver if there is an erro	or in the fifth his

of the transmitted data and an error in the fifth bit of the transmitted checksum? Comment

(5 pts)

briefly on the result.

4. Suppose you receive the following series of IP packets at a destination host (be sure to remember that the length field in the packet *includes the header*, and the offset is specified as the number of 8-byte blocks from the beginning of the data in the original IP datagram):

#	ID	Flags	Offset	Total Length
1	0xdb7a	-	370	300
2	0x7823	MF	370	1500
3	0x992a	MF	185	300
4	0x45a9	-	0	1500
5	0x7823	MF	0	1500
6	0x992a	MF	0	1500
7	0xdb7a	MF	185	1500
8	0x9ffb	-	200	1500
9	0xdb7a	MF	0	1500
10	0x33aa	_	0	1500

What packet IDs have you completely received, and how many total data bytes are in each of the completely received packets? For this problem, you can assume that all IP packets have no options. (15 pts)

5a.	Why does the Offset field in the IP header measure the offset in 8-byte units? (Hint: Recall that the Offset field is 13 bits long.)
5b.	Some signaling errors can cause entire ranges of bits in a packet to be overwritten by all 0s or all 1s. Suppose all the bits in the packet including the Internet checksum are overwritten. Could a packet with all 0s or all 1s be a legal IPv4 packet? Will the Internet checksum catch that error? Why or why not?
5c.	IP currently uses 32-bit addresses. If we could redesign IP to use the 6-byte MAC address instead of the 32-bit address, would we be able to eliminate the need for ARP? Explain why or why not.

6. You are a router, and one of your outgoing links has an MTU of 1000 bytes (ignore layer 2 headers). You receive the following packets that all need to be sent out over this link:

#	ID	Flags	Offset	Total Length
0	0x1930	-	0	1000
1	0x92ad	-	0	3000
2	0x944f	DF	0	1000
3	0xaa22	-	185	1001
4	0x78a1	MF	370	1500
5	0x3ac8	DF	0	1500

Fill in the table below with the header fields of the packets that you send out (you may not need all of the rows). The first packet has been completed for you. (10 pts)

#	ID	Flags	Offset	Total Length
1	0×1930	-	0	1000
2				
3				
4				
5				
6				
7				
8				
9				
10				