

Problem 1

Suppose an application generates chunks of 60 bytes of data, each chunk gets encapsulated in a TCP segment, and then an IP datagram.

1. What percentage of each datagram will be overhead, and what percentage will be application data?
2. What would be the overhead if each TCP segment include 100 of application chunks (i.e., 100×60 bytes), assuming the maximum size of an IP packet is 500 bytes and sending such big TCP payload would require fragmentation.

[Write your answer here](#)

Problem 3

Calculate the network mask, the number of bits of the network, the number of endpoint addresses in the network (excluding special addresses), the network address, and the broadcast address of the network for the following:

1. 131.179.196.0/24
2. 169.232.34.48/30
3. 196.22.136.0/21
4. 93.181.192.0, netmask 255.255.224.0
5. 10.128.0.0, netmask 255.192.0.0

Write your answer here

Problem 4

Why is the IP header checksum recalculated at every router?

[Write your answer here](#)

Problem 5

Install *Wireshark* (<https://www.wireshark.org/>). Then, (i) start capturing a packet trace from your network interface, (ii) open a web browser, (iii) go to <https://www.cs.ucla.edu/>, (iv) and then stop capturing the trace.

Investigate any TCP packet from your network interface to the UCLA CS web server. What is the IP address of your network interface? What is the IP address of www.cs.ucla.edu? Provide the screenshot that shows the IP addresses in the investigated packet.

Write your answer here (Also, attach the screenshot)