**CSC 335 Data Communication and Networks**

**Homework 4**

1. (0.5 point) Please determine the IP address assigned to your home computer. (use ipconfig on Windows machine or Network Utility on a MAC). Please attach a screenshot.

**My IP address is 104.201.218.48.Text

Description automatically generated**

1. (1 points) Please find the IP addresses of the following web sites using nslookup from your command prompt (cmd for windows and terminal for Mac) and attach a screenshot.
   1. molly.cs.wcupa.edu: **144.26.62.185**

Text

Description automatically generated

* 1. [www.cs.princeton.edu](http://www.cs.princeton.edu): **144.26.1.100**

Text

Description automatically generated

* 1. [www.scholar.google.com](http://www.scholar.google.com): **144.26.1.100**

Text

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Please define round-trip time and explain the components of round-trip time. Then, ping one of the site using command “ping [www.google.com](http://www.google.com)” to determine the minimum, maximum, and average round-trip time (please attach a screenshot). **Round trip time is the time (typically in milliseconds) that it takes for a data packet to be sent to another computer, as well as the time it takes for the acknowledgement to be received.**

Text

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1. (1 point) What is a subnet and what is a subnet mask? Can 255.255.240.0 be a subnet mask? Why or why not? Please provide an invalid subnet mask. **A subnet is a smaller piece of the total network, basically a network inside of a network. A subnet mask is a 32-bit address that essentially allows a certain range of IP addresses in that subnet. 255.255.240.0 is a valid subnet that allows 16 IP addresses in that subnet. An invalid subnet mask would be 255.255.200.200.**
2. (1 point) Using the IP address for molly.cs.wcupa.edu you got from the previous question and the subnet mask 255.255.240.0, please identify the network ID and device ID. **Device ID: 2605:0:103:200, network ID: 144.26.62.185.**
3. (0.5 point) What are the disadvantages of using IP address classes? How does CIDR overcome these disadvantages? **It is not scalable and easy to exhaust available IP address pools in each class. CIDR allows for classless IP routing, and not be bounded by size limitations from the classes.**
4. (0.5 point) Why TTL field is important? **The time to live filed in important because it increases available bandwidth on networks by discarding packets that have been on the network too long.**
5. (0.5 point) What is IPv6. Please explain the structure of IPv6 packet header. **IPv6 is the sixth version of the Internet Protocol. It increases the smaller 32-bit size of an IPv4 address to a 128-bit IPv6 address.**
6. (2 points) There are two types of routing algorithms, distance vector and link state. Please draw the routing table for the following network topology for both routing algorithms.

5 4

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