

UNCA CSCI 373 Computer Networking
Ordinary Exam 1
5 March, 2015

This is a closed book and closed notes exam. It is to be turned in by 4:25 PM.

Communication with anyone other than the instructor is not allowed during the exam. Furthermore, calculators, cell phones and any other electronic or communication may not be used during this exam. Anyone needing a break during exams must leave their exam with the instructor. Cell phones or computers may not be used during breaks.

Name: _____

Problem 1 (9 points) Internet model

The Internet model is the most widely used model for networking. It is also the model used in the Socket API. List the layers of this model and describe the function of each layer of the Internet model.

Problem 2 (7 points) Internet model top layer

List at least two widely protocols that exist at the top level of the Internet model. Give a brief description of your chosen protocols.

Problem 3 (9 points) Internet model next-to-top layer

There are two very significant protocols in the next-to-top layer of the Internet model. Describe these protocols. Pay particular attention to the services provided by these layer. Also, describe how programmers come to use these protocols.

Problem 4 (25 points) Vocabulary

Give a brief definition of six (your choice) of the following seven terms or programming interfaces.

accept (from the socket interface)

CRLF

JSON

listen (from the socket interface)

sequence number

root server

sys.argv

Problem 5 (25 points) Client networking

In the solution for homework 2, four methods were used from the Python socket module. The headers for these four methods are listed below **exactly** as they appear in the documentation for the Python socket module.

- `socket.close()`
- `socket.connect(address)`
- `socket.makefile([mode[, bufsize]])`
- `socket.socket([family[, type[, proto]])`

Additionally, two constants from the socket module were used in the solution.

- `socket.AF_INET`
- `socket.SOCK_STREAM`

Write a client in Python that performs the following actions.

- Connects to a server at port 5161 on `cowee.cs.unca.edu` and sends a single line of input with one question (of your choice), such as:
 `Will it really snow?`
- The client then reads the server's answer, which could be something like:
 `How should I know! This is CSCI not ATMS.`
- The client prints this message and then terminates.

Problem 6 (12 points) More Python

This isn't really a networking problem, but it relates heavily to Homework 4. Write a Python function called `every_other` that receives an array as its single parameter and returns every other element (starting with the zeroth of the array). For example, if the function is passed `['CSCI', 'is', 'fun']`, it should return `['CSCI', 'fun']`.

```
def every_other(in_list):
```

Problem 7 (8 points): RPC implementation

Explain RPC mechanisms use transaction ids (XIDs) to implement reliable calls?

Problem 8 (5 points):

What is the bandwidth required to transmit GSM mobile voice audio of 260-bit samples at 50 Hz? (Question 27(c) of the textbook.)