

Due Thursday, March 25th 2021 at 11:55pm to Canvas as **.txt or .pdf**

Late submissions will be penalized by 10% per day (or part thereof), up to **10 days**. After 10 days, the assignment will be given a 0%, as no later work can be accepted.

Requirements: Submit to Canvas a file named Homework2Answers.txt (or Homework2Answers.pdf, if using an application such as MS Word or Google Docs).

Answer all of the following **bolded** questions *in your own words*. No form of plagiarism will be tolerated (including copying answers from peers/internet)!

1)

- a. If using a Windows machine, download putty.exe at its web page www.chiark.greenend.org.uk/~sgtatham/putty/download.html
 - a. When you start PuTTY, connect to www.csun.edu on port 80, logging all session output to a local file (which you can copy/paste into your answers)
 - i. You will want to use the following settings for successful connection...
 1. Session (Main options)->Connection type: **telnet**
 2. Session (Main options)->Close window on exit: **never**
 3. Terminal->Keyboard: **backspace is CTRL-H**
 4. Connection->Telnet: may need to switch to **Passive** mode (from Active)
- b. If not using PuTTY, you may launch telnet or netcat (nc) in your Mac terminal app or within a Linux shell, to connect to www.csun.edu on port 80 as follows:

```
telnet www.csun.edu 80
```

or

```
nc -v www.csun.edu 80
```

Note: newer MacOS versions discourage use of telnet

- c. When the session starts, type the following **EXACTLY (making note of spaces)**:

```
GET / HTTP/1.1
Host: www.csun.edu
```

Then type 2 newlines.

(If needed, you can type ctrl-] and then type quit to exit telnet app.)

- d. What is the first line received from the server?
-

- e. What is the meaning of the numeric status code you receive in this line (from prior question)?

- f. In general, what does the command “GET /” do?

- g. Write the equivalent URL to access this site, as performed in part **f**...

- h. Now retry with the command “GET /xyz.html HTTP/1.1” on line 1 (and be sure to put Host: www.csun.edu on the next line) What do you receive this time?

- i. What is the meaning of the status code from part **h**?

- j. What web-server type and version is being run at www.csun.edu from the info returned in part **i**?

2) A fictional webserver at adamkaplan.org is configured so that its DocumentRoot (root directory for web files) is /var/www

Consider the following URL... <https://adamkaplan.org/the/last/djedhi.html>

a. What is the complete path of the file *djedhi.html* on the server?

b. What is the domain name of the server?

c. What is the protocol being used?

d. What port (on the server) will the web browser try to connect to for this request?

3) Use the website mxtoolbox.com to run a DNS Lookup (*see tab labeled DNS Lookup*). At the prompt, enter a domain. Then, in the results, click **Transcript** (link toward lower right of results div) for full "Session Transcript" of the search.

a. What is the Session Transcript for the domain www.cs.ucla.edu?

b. What is the Session Transcript for the fictional domain adamkaplan.org?

c. What is the Session Transcript for the fictional domain flatitude.google.com?

4) Show the entire URL in the browser's address bar after the following form is submitted. Assume the user did not change any defaults before clicking the Submit button.

NOTE: copy/pasting this code will not work, because these quotes are Microsoft "smart quotes". You will have to change them for "straight quotes" in your code if you want to try this example. In general you will need to learn how a form of this type submits, and the style of query string it produces.

```
<form method="get" action="http://akaplan.edu/echo.php">
  <input type="hidden" name="a" value="b">
  <input type="hidden" name="q" value="15">
  <textarea name="d" rows="4" cols="20">funk</textarea>
  <input type="text" name="c" size="1" maxlength="1" value="4">
  <input name="b" type="radio" value="1">
  <input name="b" type="radio" value="2" checked>
  <input name="b" type="radio" value="3">
  <select name="e">
    <option value="z" selected></option>
    <option value="y"></option>
    <option value="x"></option>
  </select>
  <input type="reset" value="Reset">
  <input type="submit" value="Submit">
</form>
```

URL: _____

5) Using the tracert command in your Windows command prompt (or traceroute in a Mac terminal or Linux shell), trace the route through the internet to the following servers...

In your answer, write how many hops were needed from your machine to the destination.

a) csun.edu

b) youtube.com

c) www.cs.vu.nl

6) Host A initiates a connection to host B via TCP, and A's random number generator provides sequence #42. Host B's random number generator provides sequence #109. What are the packets exchanged to establish the connection (i.e. the 3-way handshake packets)? For each packet, show the source host (A or B), the destination host (A or B), the sequence number, acknowledgment number (if applicable), and the flags that are set.

Packet #1: Source _____ Dest _____ Seq Num _____ ACK Num _____ flags: _____

Packet #2: Source _____ Dest _____ Seq Num _____ ACK Num _____ flags: _____

Packet #3: Source _____ Dest _____ Seq Num _____ ACK Num _____ flags: _____