1.

Network(DDN)	IP (DDN)	Netmask(CIDR)	Broadcast (DDN)
10.14.208.0	10.14.210.88	/20	10.14.223.255
192.168.161.64	192.168.161.64	255.255.255.192	192.168.161.127

IP ADDR: 010.014.210.088
NETMASK: 255.255.240.000
bitwise and

010.014.208.000 -> network address 10.14.208.0
10.14.208.0/20 (the number of 1 bits)

IP ADDR: 010.014.210.088
~NETMASK: 255.255.240.000
bitwise or

010.014.223.255 -> broadcast address 10.14.223.255

BRDCAST: 192.168.161.127
~NETWORK: 192.168.161.64
bitwise xor

255.255.255.192 -> Netmask 255.255.255.192

IP ADDR: ???:???:???:???
~NETMASK: 255.255.255.192
bitwise or

192.168.161.127 -> Possible IP ADDR: 192.168.161.64
From this, I know that the IP ADDR must be less than 128 in the last byte since
the bit for 128 is a 0 in the broadcast address

IP ADDR: 192.168.161.64
NETMASK: 255.255.255.192
bitwise and

192.168.161.64 -> Possible IP ADDR Works: 192.168.161.64
From this, I know that the IP ADDR must be at least 64 or greater in the last byte since
the bit for 64 must be a 1 for both the IP and Netmask

From further investigation, the IP addresses can be 192.168.161.64 to 192.168.161.127

Last byte of Netmask must be 11000000
Last byte of IP must be 01XXXXXX

2.
a. https://realpython.com/python-sockets/

b. The tutorial was completed

c. socket() - Creates the socket to be used for communication.

bind() - Binds the socket to a network interface and a port. This is to know where the information needs be sent.

listen() - Enables server to take connections. So the server essentially listens for any connections.

accept() - Waits and blocks for a connection. If a connection is received, returns a socket object.

connect() - Function that the client calls to initiate a connection to the server.

3. sudo apt-get install apache2
Apache2 is setup and the webserver could be accessed on the local network
To port forward on the RPi side:
sudo vim /etc/apache2/ports.conf

within the conf file, the following line was changed
Listen 80 -> Listen 69

Also:
sudo vim /etc/apache2/sites-enabled/000-default.conf

The following line was changed
<VirtualHost *:80> -> <VirtualHost *:69>

4. sudo apt-get install sqlite3

5. sudo apt-get install php
sudo apt-get install php7.3-sqlite3

To get php "integrated" into the web server, created a php file:
sudo vim /var/www/html/database.php

Can also integrate it right into the html code in /var/www/html/ without having to create a new php file with:

```
<?php
... code goes here ...
?>
```

6. Job works but isn't every other day on the transition to a different month from an odd dayed month:

```
5 11 */2 * * xkcd
55 23 */2 * * xkcd
```

Job works but isn't every other day on a leap year during transition between February and March and transition between years:

```
5 11 */2 1 * xkcd
55 23 */2 1 * xkcd
5 11 2-30/2 2,3 * xkcd
55 23 2-30/2 2,3 * xkcd
5 11 */2 4,5 * xkcd
55 23 */2 4,5 * xkcd
5 11 2-30/2 6,7 * xkcd
55 23 2-30/2 6,7 * xkcd
5 11 */2 8 * xkcd
55 23 */2 8 * xkcd
5 11 2-30/2 9,10 * xkcd
55 23 2-30/2 9,10 * xkcd
5 11 */2 11,12 * xkcd
55 23 */2 11,12 * xkcd
```

Couldn't find a solution where it was always every other day...

7. enscript -T 4 --header='$n %E %*|$%|Spencer Goulette' hw07.txt -o - | ps2pdf - ECE-331-Goulette-Spencer-HW-07.pdf