CPS 472/572: Homework 4 **Dr. Clark**

UDP Programming
Due Friday March 7, 1997

For this homework you will design and write your own application program that communicates using UDP. The application you are designing is a time and date service. You will write both the client and server portions of this application.

The client interface will allow users to request time and date information from the server. The client should support five different command line options. For instance, if your client is called *timedate* you should be able to do the following commands.

- **timedate -H** - print the current hour (e.g. 1 if it is 1:15)
- **timedate -M** - print the current minute (e.g. 15 if it is 1:15)
- **timedate -m** - print the current month (e.g. March)
- **timedate -d** - print the current day of the month
- **timedate -y** - print the current year

When you build this application you are to assume that the client program is not capable of determining the time and date by itself. Instead, the client must request this information from the time and date server. However, the client may format the information for display to the user.

Your server application should listen for requests from *timedate* clients and return the information they requested. After responding to a request the server should then listen for more requests. Unlike the sample server code we discussed, this time and date server should never exit but should remain available for clients to access.

Notes:

1. As before, you will need to use a unique port number from others in the class to prevent confusion. You can use the same port number you used in the previous homework.
2. You should use the same approach as before of hard coding the server's IP address into the client source code.
3. You will need to develop your own "protocol" for the communication between the client and the server. While you should use UDP to transfer messages back and forth, you must determine exactly what messages will be sent, what they mean and when they will be sent (syntax, semantics and timing).
4. Your server will need to determine the time of day from the system. You can do this using any of several library routines already provided. Look at the man page for *gettimeofday()* and *ctime()* for some sample useful calls. (You can look at man pages using the man command, e.g. *man gettimeofday*)
5. You will also want to look at the man pages for the various socket calls. Check out *socket(), bind(), sendto(), recvfrom(), close()*.
6. Feel free to use *udpsnoop* as a helpful tool when debugging your UDP applications.

   TURN THIS PAGE OVER! IMPORTANT INSTRUCTIONS ON THE BACK.

7. You must test your program! Provide me with a sample output that shows all of your functions working.

8. You will turn in your assignment by printing the source code and bringing it to me.

   You must also submit your program online by putting your code and sample output in a directory and then running:

   /home/rjc/pub/cps472/submit directoryname

   Make sure you provide enough information that I will be able to run your programs!