

>>> Assignment #2 for Computer Networks (EEL 4781) <<< Due on 09/22/09 at the beginning of class

This assignment covers material in chapter 2 of the textbook and as covered in class lecture.

Problem #1

Do problem P1 (page 181) from the text book.

Problem #2

Do problem P2 (page 181) from the text book.

Problem #3

Do Problem P5 (page 183) from the text book.

Problem #4

Do problem P14 (page 184) from the text book.

Problem #5

Write three programs – a UDP sender, UDP reflector, and UDP receiver. The UDP sender sends a message to a given IP address and port number, the UDP reflector receives a message and resends it to a hardwired IP address and port number, and the UDP receiver receives a message and outputs it to stdout. The figure on the next page shows the operation of the three program where `udpReflect` and `UdpReceive` must be running before `udpSend` is executed. Your three programs must function and generate the identical output to the shown figure (e.g., your UDP sender should accept command line input as shown in the example in the figure). Your three programs should be able to run on one machine using different port numbers, or on three separate machines. Note that in the shown figure the udp reflector is hardwired to listen on port 1080 and is hardwired to resend received messages to IP address 127.0.0.1 and port 2080. Note that the udp receiver is hardwired to listen on port 2080. Submit the source code for each program and a screen shot (very similar, if not identical, to what is shown on the next page). Submit also a screen shot showing successful builds (also as shown on the next page – but you may obviously use any compiler you wish). The TA may ask you for your source code and/or executables in softcopy form if there are any questions on your source code, build, or execution. You will be graded for style; indeed, a key purpose of this project is to introduce you to clean programming style. **Hint:** You may use `udpServer.c` and `udpClient.c` as starting points.

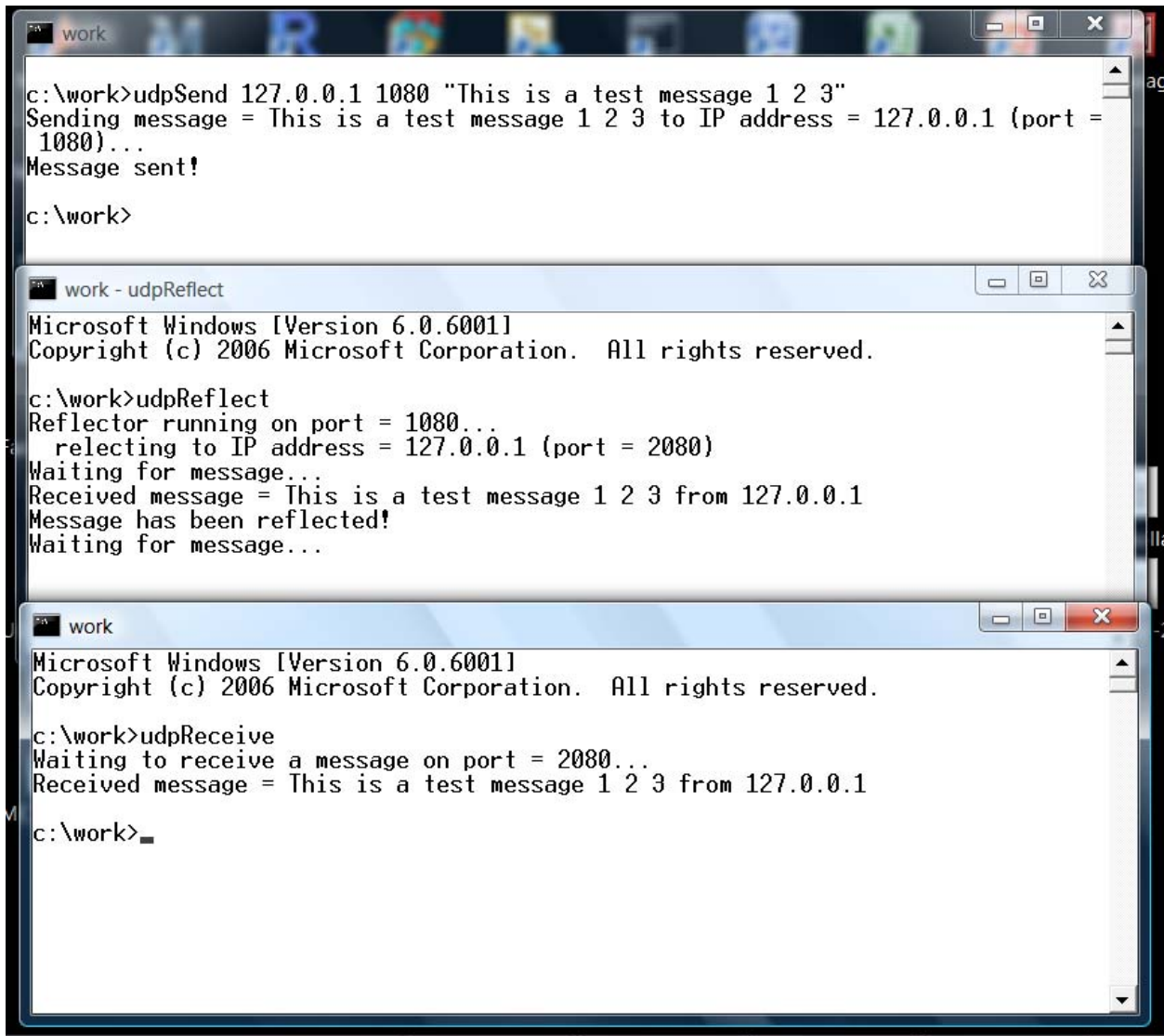
Extra Credit Problem (worth 10 points)

Describe how you would measure the message throughput of the UDP reflector in the above problem.

Note:

The TA and I are here to help you! Make use of help if you need it.

Figures for Problem #5 for Assignment #2



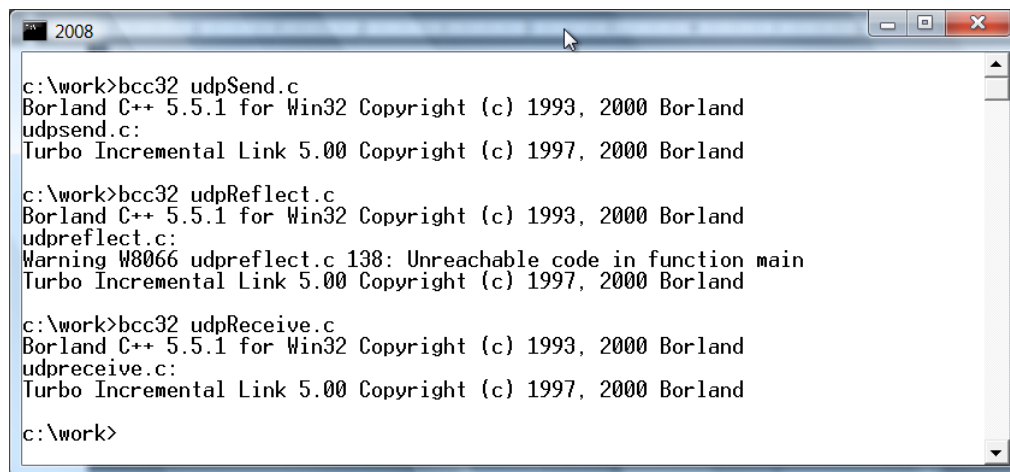
```
work
c:\work>udpSend 127.0.0.1 1080 "This is a test message 1 2 3"
Sending message = This is a test message 1 2 3 to IP address = 127.0.0.1 (port =
1080)...
Message sent!
c:\work>

work - udpReflect
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation. All rights reserved.

c:\work>udpReflect
Reflector running on port = 1080...
  reflecting to IP address = 127.0.0.1 (port = 2080)
Waiting for message...
Received message = This is a test message 1 2 3 from 127.0.0.1
Message has been reflected!
Waiting for message...

work
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation. All rights reserved.

c:\work>udpReceive
Waiting to receive a message on port = 2080...
Received message = This is a test message 1 2 3 from 127.0.0.1
c:\work>
```



```
2008
c:\work>bcc32 udpSend.c
Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
udpSend.c:
Turbo Incremental Link 5.00 Copyright (c) 1997, 2000 Borland

c:\work>bcc32 udpReflect.c
Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
udpreflect.c:
Warning W8066 udpreflect.c 138: Unreachable code in function main
Turbo Incremental Link 5.00 Copyright (c) 1997, 2000 Borland

c:\work>bcc32 udpReceive.c
Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
udpreceive.c:
Turbo Incremental Link 5.00 Copyright (c) 1997, 2000 Borland

c:\work>
```