**Electrical and Computer Engineering Department**

**ENCS436 - Computer Networks**

**Project #1**

**Objective:**

There are a number of objectives to this assignment beyond just a simple socket programming assignment. First, if you have not ever programmed sockets before, it is relatively straightforward, but still an effort. Second, it will help you “tune up” your programming skills and prepare you for other upper-division networking courses. Third, because you can use the Internet to look for examples, this assignment will help you see just how many network-programming aids are out in the Internet. Finally, having some practical experience will put many of the protocol concepts we learn into perspective.

**Assignment:**

Write a Socket-based C/Java server program that responds to client messages as follows:

When it receives a message from a client, it simply

1. Reverse all the characters
2. Reverse the capitalization of the strings
3. Send back the same to the client.

Write both client and server programs demonstrating this.

**Submission:**

Choose either Java or C.

For C Programmers:

Your task is to write the server and client programs in C using UDP and TCP. You will turn in 4 different programs.

1. Server in C using UDP     (file name to turn in : server\_c\_udp.c)
2. Client in C using UDP        ( file name to turn in : client\_c\_udp.c)
3. Server in C using TCP        ( file name to turn in : server\_c\_tcp.c)
4. Client in C using TCP        (file name to turn in : client\_c\_tcp.c)

For Java Programmers:

Your task is to write the server and client programs in Java using UDP and TCP. You will turn in 4 different programs.

1. Server in Java using UDP     (file name to turn in : server\_java\_udp.java)
2. Client in Java using UDP        (file name to turn in : client\_java\_udp.java)
3. Server in Java using TCP        (file name to  turn in : server\_java\_tcp.java)
4. Client in Java using TCP        (file name to turn in : client\_java\_tcp.java)

**Grading Guidelines:**

In addition to correctness, part of the points count towards how well code is written and documented. NOTE: good code/documentation does not imply that more is better. The goal is to be efficient, elegant and succinct!

**20 pts**: UDP client

**20 pts**: TCP client

**25 pts**: UDP server

**25 pts**: TCP server

**10 pts**: Documentation/Proper References ( You need to write a report that includes the description of the problem, how you solved it, the APIs you used in the code and the description of the functions used to create the connection between the client and the server. Also submit a **printed out copy for the code** and screen shots for result)

Notes:

1. Copied assignment will get **ZERO**, every student should be able to explain how code works.
2. You are allowed to work in groups of 2 at max.
3. Deadline December 5th