

CS 380
Project 2

My repository for this class is under CS 380 – Computer Networks
<https://github.com/jarodNakamoto/College-CS-Courses.git>

Source Code Below:

```
import java.io.InputStream;
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.PrintStream;
import java.net.Socket;
import java.util.Scanner;
import java.io.IOException;

public final class PhysLayerClient {

    public static final int PREAMBLE_SIZE = 64;
    public static final int MSG_SIZE = 32;

    public static int fiveBToFourB(int fiveB)
    {
        int fourB;
        if((fiveB ^ 0x1E) == 0)
            fourB = 0x0;
        else if((fiveB ^ 0x009) == 0)
            fourB = 0x1;
        else if((fiveB ^ 0x014) == 0)
            fourB = 0x2;
        else if((fiveB ^ 0x015) == 0)
            fourB = 0x3;
        else if((fiveB ^ 0x00A) == 0)
            fourB = 0x4;
        else if((fiveB ^ 0x00B) == 0)
            fourB = 0x5;
        else if((fiveB ^ 0x00E) == 0)
            fourB = 0x6;
        else if((fiveB ^ 0x00F) == 0)
            fourB = 0x7;
        else if((fiveB ^ 0x012) == 0)
```

```

        fourB = 0x8;
    else if((fiveB ^ 0x013) == 0)
        fourB = 0x9;
    else if((fiveB ^ 0x016) == 0)
        fourB = 0xA;
    else if((fiveB ^ 0x017) == 0)
        fourB = 0xB;
    else if((fiveB ^ 0x01A) == 0)
        fourB = 0xC;
    else if((fiveB ^ 0x01B) == 0)
        fourB = 0xD;
    else if((fiveB ^ 0x01C) == 0)
        fourB = 0xE;
    else
        fourB = 0xF;
    return fourB;
}

```

```

public static void main(String[] args) throws Exception {

```

```

    try (Socket socket = new Socket("18.221.102.182", 38002)) {

```

```

        //display that server connection was successful
        String address = socket.getInetAddress().getHostAddress();
        System.out.printf("Connected to: %s%n", address);

```

```

        //recieves bytes

```

```

        InputStream is = socket.getInputStream();

```

```

        //receive preamble and calculate baseline
        double baseline = 0.0;
        for(int i = 0; i < PREAMBLE_SIZE; i++)
        {
            baseline += ((double)(is.read()))/PREAMBLE_SIZE;
        }

```

```

        System.out.println("Baseline established from preamble: " + baseline);

```

```

        //get the encoded message
        int[] bytesReceived = new int[MSG_SIZE * 10];

```

```

        for(int i = 0; i < bytesReceived.length; i++)
        {
            if(is.read() > baseline)

```

```

        bytesReceived[i] = 1;
    else
        bytesReceived[i] = 0;
}

//get decodedBytes
byte[] decodedBytes = new byte[MSG_SIZE];

int count = 1;
int countDecoded = 0;
int fiveB = bytesReceived[0];
int prev = bytesReceived[0];
for(int i = 1; i < bytesReceived.length; i++)
{
    int curr = bytesReceived[i];
    //shift 5B value over 1, append 0 to end
    fiveB = fiveB << 1;
    if(prev != curr) //then the signal was a one change end digit to one
        fiveB = fiveB ^ 1;
    //else it was a zero, do nothing
    count++;
    prev = curr;
    //if 5 bits have been read then we have a half byte
    if(count == 5)
    {
        int fourB = fiveBToFourB(fiveB);
        decodedBytes[countDecoded] = (byte)fourB;
        fiveB = 0;
    }
    //if 10 bits then we have a whole byte
    if(count == 10)
    {
        int fourB = fiveBToFourB(fiveB);
        int temp = decodedBytes[countDecoded];
        temp = temp << 4;
        temp = temp ^ fourB;
        decodedBytes[countDecoded] = (byte)temp;
        countDecoded++;
        fiveB = 0;
        count = 0;
    }
}

//print to console the decoded bytes

```

```
System.out.print("Received 32 bytes: ");
for(byte b: decodedBytes)
    System.out.print(String.format("%02X", b));

//sends bytes to server
OutputStream os = socket.getOutputStream();
os.write(decodedBytes);

//receive if msg is correct
int response = is.read();
if(response == 1)
    System.out.println("\nResponse good");
else
    System.out.println("\nResponse bad");
System.out.println("Disconnected from server.");
is.close();
    }
}
}
```