

Name: key  
please type or print your name

## EE-WBC Exam No. 2 (100pts.)

### General Remarks

Do not use back of the pages for answers. The back side of this test will not be graded. Attach more pages if necessary. Open books, open notes but no sharing allowed. No electronic equipment allowed during the exam, including cell phones.

DL: 12 ERR: \_\_\_ PTS: \_\_\_ WTL: \_\_\_ GR: \_\_\_

### Problem 1 (20pts.) Simple Questions about the Language

Please answer very briefly but straightforward the following questions that correspond to Java:

1. When I want to post a Java applet on a Web server

- do I need to copy my files with \*.java extesnsion?            yes / no  
// this is a pass/fail question - 2 points

- in addition/instead of .java files I need to copy also    \*.class  
// this is a pass/fail question - 2 points (.class must be listed to get credit)

2. Are primitive variable names (int, double, etc.) in Java case sensitive or not?

CIRCLE:    yes / no  
// this is a pass/fail question - 4 points

3. Are primitive variable passed by value or by reference?

CIRCLE:    by value / by reference / both  
// this is a pass/fail question - 4 points - note primitive variables, not classes

4. Why do we need "synchronized" functions and variables in multithreaded programs?

To prevent situation that two or more threads of code gets the value, modify it, and store at parallel. They should do it in sequence instead. For example increase by one can result in two increments done about the same time resulting in incremented value by 1 instead of by 2.

// must mention problems with parallel variable access, or at least that  
// the synchronization prevent multiple execution at the same time - 4 points

5. Can I run an Applet posted on cegt201.bradley.edu that download images from a WebCam that are accessible from lidya.Bradley.edu as

<http://lidya.bradley.edu/webcam.jpg> ?

CIRCLE:    yes / no  
// this is a pass/fail question - 4 points

## Problem 2 (20pts.) Network Programming, Client-Server Paradigm

Complete the implementation of the HTTP-based Counter server that runs on port 8088. When a Web browser connects to it, the browser should receive a complete valid HTML 4.01 STD Web page with the count number as the only information enclosed in a paragraph tag <p> inside the Web page body. The server should not print any unnecessary (debug) information to the console (exception reports should be printed though). The HTTP reply should promote not caching of the Web page.

```

import java.io.*;
import java.net.*;
class E2Prob2 {
    static final int port    = 8088;
    static final int maxque = 0;
    static    long  count    = 0;
    public static void main(String A[]) {
        try {
            ServerSocket server    = new ServerSocket(port, maxque);

            while (true)
            try {
                Socket client =server.accept();
                BufferedReader SR=new BufferedReader(new
                    InputStreamReader(client.getInputStream()));
                PrintWriter    SW=new PrintWriter (client.getOutputStream());

                String request = SR.readLine();
                String line;
                while (true) { // Read until an empty line or end of conection - 5pts.
                    line=SR.readLine(); if (line==null||line.equals("") ) break;
                }

                SW.println("HTTP/1.1 200 Ok"); // Write HTTP header - 5pts.
                SW.println("Server: WBC Embedded System Status Server");
                SW.println("Connection: close");
                SW.println("Cache-Control: no-cache");
                SW.println("Expires: 0");
                SW.println("Content-Type: text/html; charset=ISO-8859-1"); // !
                SW.println(); // HTTP header ends after one empty line

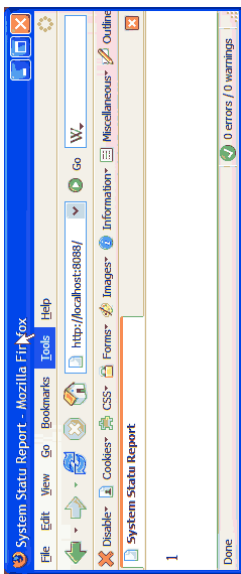
                SW.println("<!DOCTYPE html PUBLIC \"-//W3C//DTD HTML 4.0//EN\">");
                SW.println("<html><head>"); // Write HTML wrapper - 5pts.
                SW.println(" <meta http-equiv=\"Content-type\" content=\"text/html; charset=iso-8859-1\">");
                SW.println(" <meta http-equiv=\"Pragma\" content=\"no-cache\">");
                SW.println(" <title>System Statu Report</title>");
                SW.println("</head><body><p>");

                count++; SW.println(count); // update and render count - 5pts.
                SW.println("</p></body></html>"); // end ther HTML wrapper

                SW.flush();
                client.close();

            } catch (Exception e) {
                System.out.println("Error while handling a Web browser: "+e);
            }
        } catch (Exception e) { System.out.println("Fatal Server Error: "+e); }
        System.out.println("Server terminated");
    }
}

```



**Problem 3 (20pts.) TCP/IP+UDP Application Layer Protocols**

Please write the exact sequence of commands (and approximate replies from the server marked with ">") that are required to send an email provided below. Note that you need to reformat the message, and also repeat some information twice in the dialog with SMTP server. After sending it log out gracefully for the server. Assume that the server answers affirmative (no error messages) to each of your inquiry. You need to write only the sequence of line exchanges and not the program to open the connection and perform it and/or check for errors.

The email message is:

```
From: "My Name" <me@bradley.edu>
```

```
To: "Your Name" <you@bradley.edu>
```

```
Subjct: WBC Exam 2 Question 2
```

```
Body following:
```

```
This is a sample email
```

```
.
```

```
That has a single dot on one of its lines.
```

```
That single dot case is not handled correctly by the discussed sample program.
```

Write your dialog with the server here (By the way, who starts - You or the server?):

```
>200 xxx
// server has the first word - 2pts.
HELO mycomputer.bradley.edu
// helo - 2pts.
// unnecessary logging in like in POP3 -2pts.
>200 xxx
MAIL FROM: me@bradley.edu
// mail from - 2pts.
>200 xxx
RCPT TO: you@bradley.edu
// rcpt to - 2pts.
>200 xxx
DATA
// data - 2pts.
>300 xxx
From: "My Name" <me@bradley.edu>
To: "Your Name" <you@bradley.edu>
Subject: WBC Exam 2 Question 2
// Subject within data and an empty line - 2pts.
<CR - empty line>
This is a sample email
..
// handling a line starting with a dot- 2pts.
That has a single dot on one of its lines.
That single dot case is not handled correctly by the discussed sample program.
.
// terminate data - 2pts.
>200 Message accepted for delivery
QUIT
// quit - 2pts.
>200 xxx
// using POP3 +OK/-ERR instead of SMTP replies 200/300/400/500-level - 5pts.
// doing POP3 instead of SMTP - 20pts.
```

**Problem 4 (20pts.) GUI Layouts and Graphics**

Complete code for a GUI applet that looks like one in the provided figure. Some instructions or their portions were left out and replaced by underscore. This is GUI elements, their initialization, and GUI layout exercise only. Applet does not have any functionality, nor actions attached to the elements.

```
import java.awt.*;
import java.applet.Applet;
// <applet code="E2Prob4.class" height="200" width="200"> </applet>
```

```
public class E2Prob4 extends Applet {
```

```
    TextField    temp;
```

```
    Label        unit;
```

```
    Checkbox     mode;
```

```
    Button       doit;
```

```
    public void init() {
```

```
        setLayout(new FlowLayout());
```

```
        doit = new Button ("Set");
```

```
        unit = new Label ();
```

```
        unit.setText("F");
```

```
        temp = new TextField ("70",3);
```

```
        mode = new Checkbox ();
```

```
        mode.setState(true);
```

```
        mode.setLabel("optimize");
```

```
        add(temp);
```

```
        add(unit);
```

```
        add(mode);
```

```
        add(doit);
```

```
    }
```

```
}
```

```
// each error - 2pts.
```

```
// bad capitalization of elements is forgiven
```

```
// except TextFiled and Button (used in recent homework) - 2pts.
```

```
// correcting sequence in the "add" per correction - 1pts.
```



**Problem 5 (20pts.) Event Handling and Threads**

Write code for a GUI applet that has two buttons. Initially both buttons are of Color.cyan. When one button is clicked it should become of Color.red and the remaining button should become of Color.green. The colors should be updated accordingly after a button is clicked. Follow the suggested class organization for event handling. Do not add unnecessary code.

```
// This is an exact portion of a recent homework assignment and is graded very strictly
import java.awt.*;
import java.awt.event.*;
import java.applet.Applet;
```

```
public class E2Prob5 extends Applet implements ActionListener { // a listener - 3pts.
```

```
    Button B1, B2;
```

```
    public void init() {
        B1 = new Button("left");
        B1.setBackground(Color.cyan);
        add(B1);
        B2 = new Button("right");
        B2.setBackground(Color.cyan);
        add(B2);
```

```
        B1.addActionListener(this);
```

```
        B1.addActionListener(this);
```

```
        // register listener(s) - 4pts.
```

```
    }
```

```
// INTERFACE ActionListener
```

```
    public void actionPerformed(ActionEvent e) {
```

```
        if (e.getSource()==B1) {
```

```
            B1.setBackground(Color.red);
```

```
            B2.setBackground(Color.green);
```

```
        } else if (e.getSource()==B2) {
```

```
            B1.setBackground(Color.green);
```

```
            B2.setBackground(Color.red);
```

```
        }
```

```
    }
```

```
// listener implementation not matching listener declared -10
```

```
// erros in code inside listener, per error -2
```

```
}
```

