

PLEASE HAND IN

UNIVERSITY OF TORONTO AT
MISSISSAUGA
APRIL EXAMINATIONS 2006

CSC 309H1
Mississauga Campus

Duration — 3 hours

PLEASE HAND IN

Examination Aids: *Two double sided $8\frac{1}{2} \times 11$ aid sheets. A non-programmable calculator.*

Student Number:

Last Name:

First Name:

Lecture Section: L5101
(A. Rosenbloom)

*Do **not** turn this page until you have received the signal to start.*
(In the meantime, please fill out the identification section above,
and read the instructions below *carefully*.)

This final examination consists of 5 questions on 19 pages (including this one), printed on both sides of the paper. *When you receive the signal to start, please make sure that your copy of the examination is complete.* Answer each question directly on the examination paper, in the space provided.

Be aware that concise, well thought-out answers will be rewarded over long rambling ones. Also, unreadable answers will be given zero (0) so write legibly.

General Hint: We were careful to leave ample space on the examination paper to answer each question, so if you find yourself using much more room than what is available, you're probably missing something. Also, remember that hints are just hints: you are not required to follow them if you can think of a different solution.

1: _____/10

2: _____/10

3: _____/10

4: _____/10

5: _____/10

TOTAL: _____/50

Good Luck!

Question 1. [10 MARKS]**CSS: Create myStyle.css described below.**

The CSS Appendix is at the end of this exam. Complete myStyle.css below. myStyle.css and the html in the CSS Appendix should produce the screenshots in the CSS Appendix.

myStyle.css

```
/*      Complete myStyle.css using the property:value pairs below.
        You will have to come up with the selectors yourself.
        This style sheet+the html in the CSS Appendix produced
        the screenshots in the CSS Appendix.

background:#000;          background:#ACE;
border: 2px solid blue;   border-color: #000;
border: solid #FFCC99;    color: #000;
color: #ACE;             color: #f00;
color: #fff;            display: block;
font: 13px Verdana, sans-serif; font: 16px Verdana, sans-serif;
font: bold 1em sans-serif; margin: 0px 0px 10px 0px;
padding: 10px;           padding: 5px 5px;
text-align: center;      text-decoration: none;
*/
body {
    margin: 10px;
    padding: 10px;
}
```

(continued...)

Question 2. [10 MARKS]**JSP**

See the JSP Appendix at the end of this exam for `FrogsBean.java` and application screen shots.

Use the `FrogsBean.java` to build the following jumping frogs game in JSP. Green frogs only move left, yellow frogs only move right. A frog can either move one space or jump another frog (to move two spaces). A frog can only move to an empty space. The user wins the game by moving all of the green frogs to the left and all of the yellow frogs to the right. The user moves a frog by clicking on its image (one click determines the move).

(continued...)

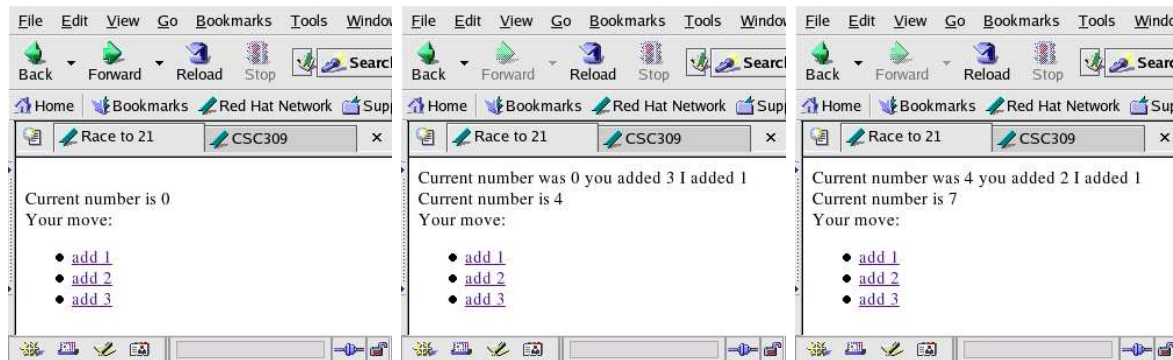
Question 3. [10 MARKS]

PHP: Create the PHP scripts described below.

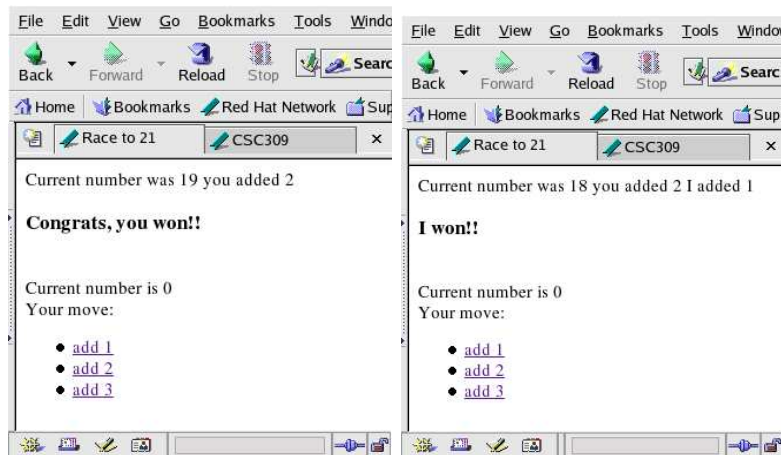
Race to 21: The *Player* plays against the *Server* with the Player moving first. The game maintains a **currentNumber**. During their turn the Player/Server adds one of 1, 2 or 3 to the currentNumber. The participant that moves currentNumber to 21 wins the game.

Below is a sequence of screens in a game: The Player visits

<http://www.gamesite.com/games/Race21.php> (to get the left screen shot), next they click on the 'add 3' link, next they click on the 'add 2' link.



A Player and a Server winning screen are shown below.



Notes: You should store the game state in a PHP session. Each click on a link submits a request back to one of your PHP scripts. Best marks for a good computer strategy and simple script/scripts.

(continued...)

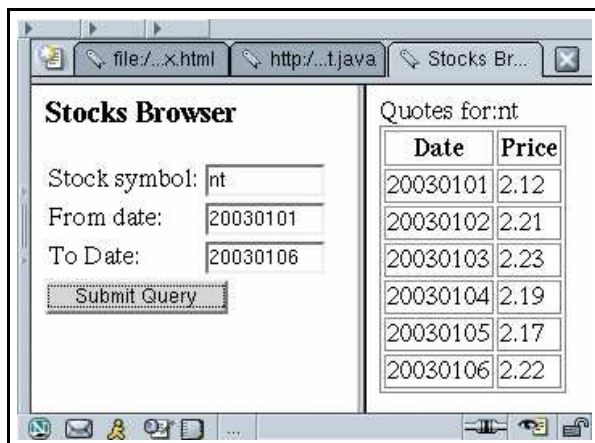
Question 4. [10 MARKS]

Create a Java Servlet for browsing historical stock quotes described below:

- Users specify a stock symbol, and an initial and final date.
- When the user presses the submit button, the Servlet returns a web page consisting of the name of the company and a table with the stocks daily prices for the specified period.
- Stock data is stored in a postgresql database with the following two tables.

```
CREATE TABLE stocks (
    id INTEGER PRIMARY KEY,
    symbol VARCHAR(3),
    company VARCHAR(20)
);
CREATE TABLE quotes (
    stockID INTEGER,
    quoteDate INTEGER,
    price REAL
);
```

- Your servlet generates the contents of the right frame shown below. Your servlet should not generate the form in the left frame.



- Do not worry about error handling.
- Assume that the user always provides all three values (stock symbol and dates) in a valid format
- Assume that the database contains records for the stock and dates the user is interested in.
- Dates are stored as 8 digit integers. For example, January 6, 2003 is stored as the integer 20030106.
- The postgresql database is named *stockExample* at *db.stockQuotes.com*, userId is *quoteClient*, password is *trespass*

(continued...)

```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
import java.util.*;
import java.sql.*;

public class GetQuote extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws IOException, ServletException
    {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
```

(continued...)

Question 5. [10 MARKS]

Modify your servlet above so that it tracks all previous quotes the user has requested **this session**. The user should be able to click on a past quote to retrieve it again.

You can mark locations on the previous page and place corresponding code here. You can add any new classes etc. here.

The screenshot shows a web browser window with two tabs: 'file:///h...dex.html' and 'http://w...tat.java'. The 'Stocks Browser' section contains a form with the following fields and values:

- Stock symbol:
- From date:
- To Date:
-

The 'Previous quotes' section displays a list of quotes for the symbol 'nt':

- [msft 20030105 20030205](#)
- [rhat 20030105 20030205](#)

Below the list, a table shows the quotes for 'nt':

Date	Price
20030101	2.12
20030102	2.21
20030103	2.23
20030104	2.19
20030105	2.17
20030106	2.22

(continued...)

There is NO question on this page!

*[If you need extra space to answer a question, use the space below and indicate **clearly** the question number.]*

There is NO question on this page!

*[If you need extra space to answer a question, use the space below and indicate **clearly** the question number.]*

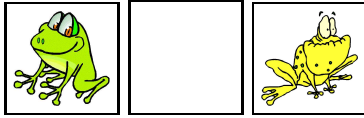
JSP Appendix: FrogsBean.java**FrogsBean.java**

```
package frogs;
public class FrogsBean {
    // Token captures the direction the piece can move
    public static final int YELLOW=1, EMPTY=0, GREEN=-1;
    private int [] board=new int[7]; // Holds one of the above

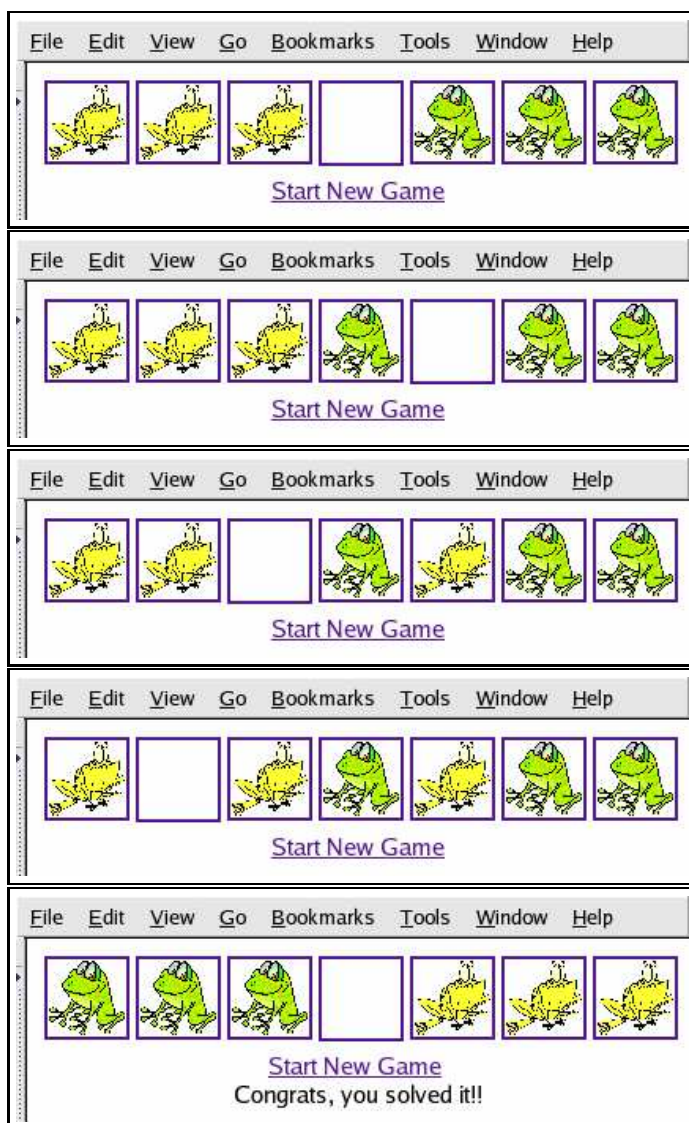
    public FrogsBean(){ reset(); }
    public void reset(){
        board[0]=board[1]=board[2]=YELLOW;
        board[3]=EMPTY;
        board[4]=board[5]=board[6]=GREEN;
    }
    public void setMove(int m){
        if(m==-1)reset();
        else if(!move(m,1))move(m,2);
    }
    private boolean move(int m, int d){
        int dest=m+board[m]*d;
        if(0<=dest && dest <=6 && board[dest]==EMPTY){
            board[dest]=board[m]; board[m]=EMPTY;
            return true;
        }
        return false;
    }
    public boolean isSolved(){
        for(int i=0;i<6;i++){
            if(board[i]>board[i+1])return false;
        }
        return true;
    }
    public int get(int i){ return board[i]; }
}
```

JSP Appendix: Screenshots

The following images are (from left to right) greenFrog.gif, empty.gif and yellowFrog.gif.

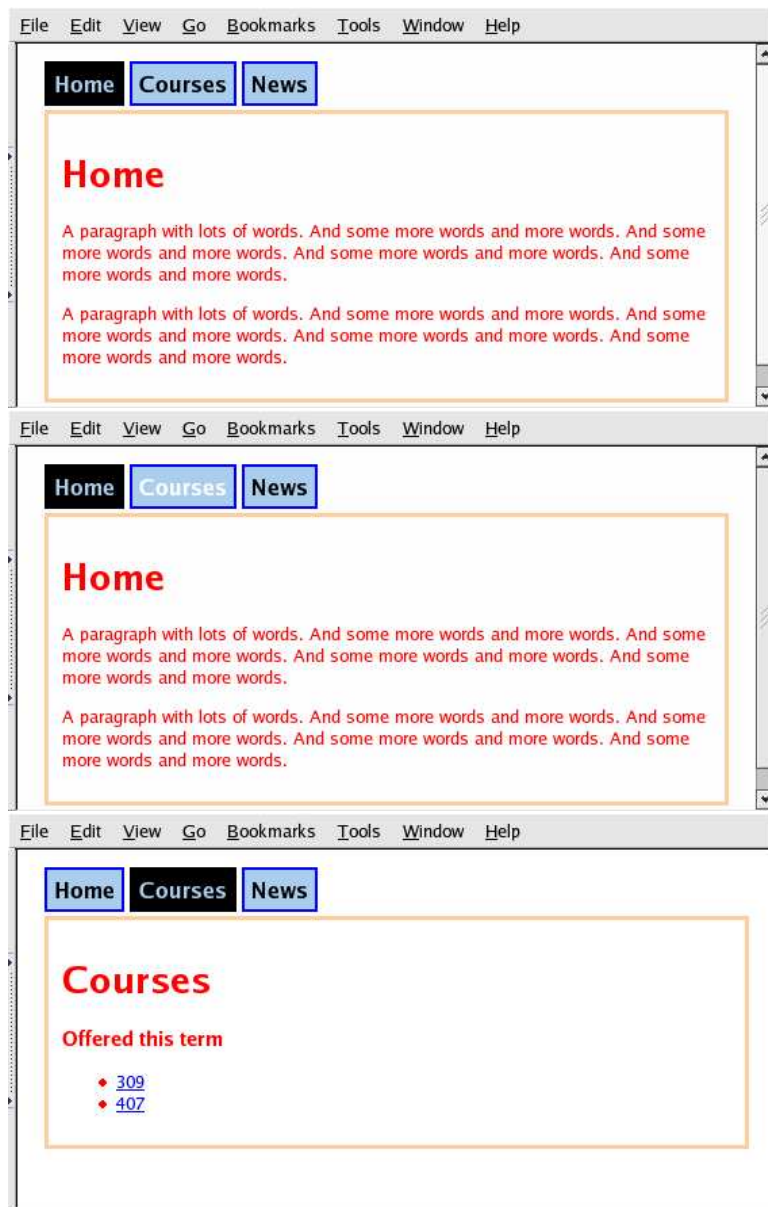


The following show (from top to bottom): The start of a new game. The result of clicking on the first green frog. The result of clicking on the first yellow frog (jumping the center green frog). The result of clicking on the second yellow frog. The last screen shot shows a winning configuration (after many more moves).



CSS Appendix: Screenshots

From top to bottom, you see home.html, home.html when the mouse is hovering over the courses link, courses.html. The page currently displayed has its menu item displayed with a black background and blue text.



CSS Appendix: home.html, courses.html**home.html**

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0//EN"
    "http://www.w3.org/TR/REC-html40/strict.dtd">

<html>
<head>
    <title>Layout Demo</title>
    <link rel="stylesheet" href="myStyle.css" type="text/css">
</head>
<body>
    <div id="links">
        <a class="selected" href="home.html">Home</a>
        <a href="courses.html">Courses</a>
        <a href="news.html">News</a>
    </div>
    <div id="content">
        <h1>Home</h1>
        <p> A paragraph with lots of words. ... </p>
        <p> And some more words and more words. ... </p>
    </div>
</body>
</html>
```

courses.html

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0//EN"
    "http://www.w3.org/TR/REC-html40/strict.dtd">

<html>
<head>
    <title>Layout Demo</title>
    <link rel="stylesheet" href="myStyle.css" type="text/css">
</head>
<body>
    <div id="links">
        <a href="home.html">Home</a>
        <a class="selected" href="courses.html">Courses</a>
        <a href="news.html">News</a>
    </div>
    <div id="content">
        <h1>Courses</h1>
        <h3>Offered this term</h3>
        <ul>
            <li><a href="link1.html">309</a></li>
            <li><a href="link2.html">407</a></li>
        </ul>
    </div>
</body>
</html>
```

Total Marks = 50