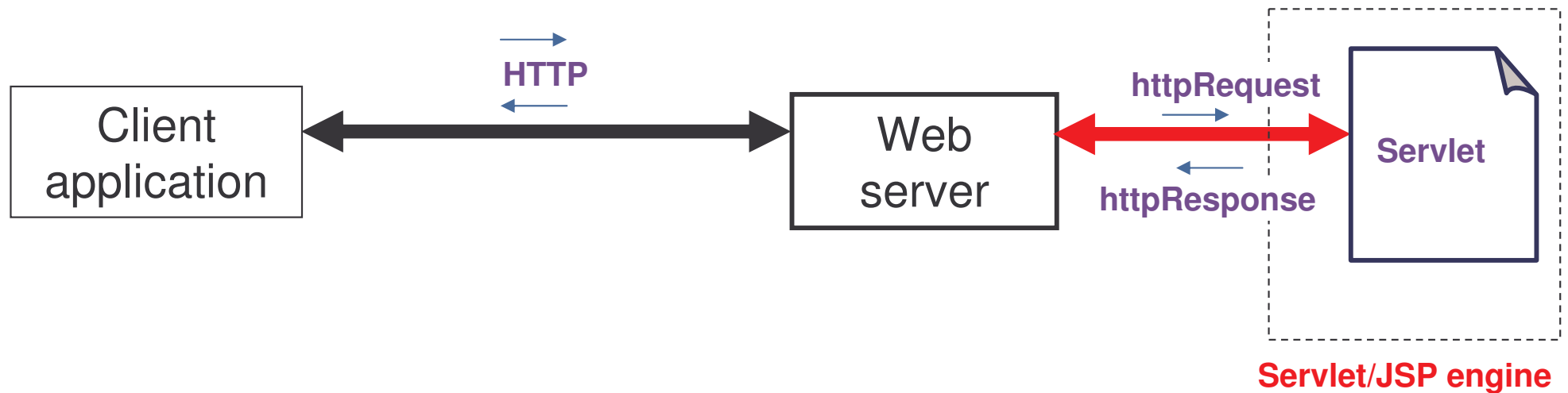
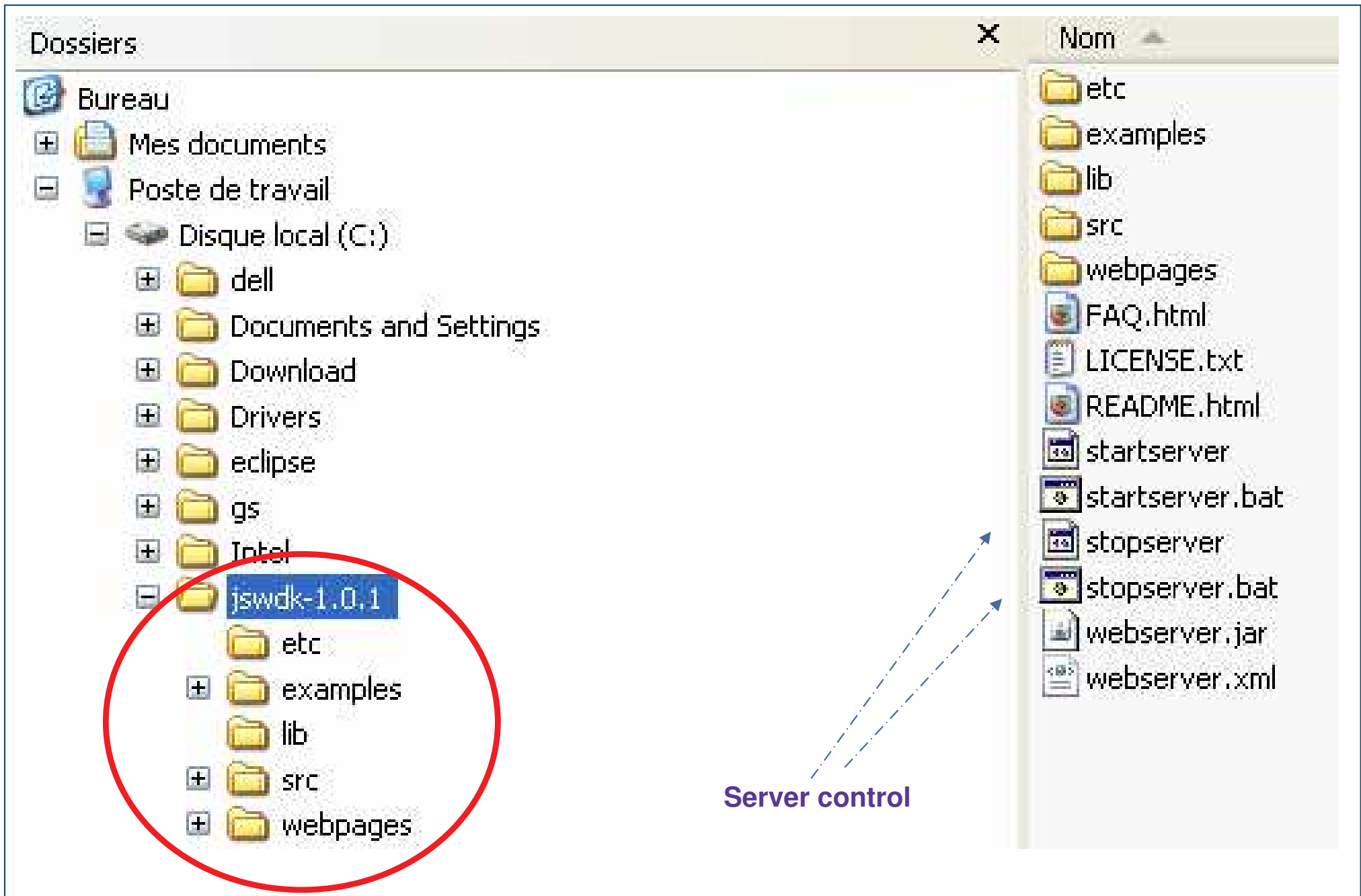


- Servlet: Java class executable from server side (in a container)



- Request from web client (browser \Rightarrow http flow)
- Method `service(HttpRequest, HttpResponse)` is executed
- Multi threading principle
- Material: JSWDK servlet container, examples rar file

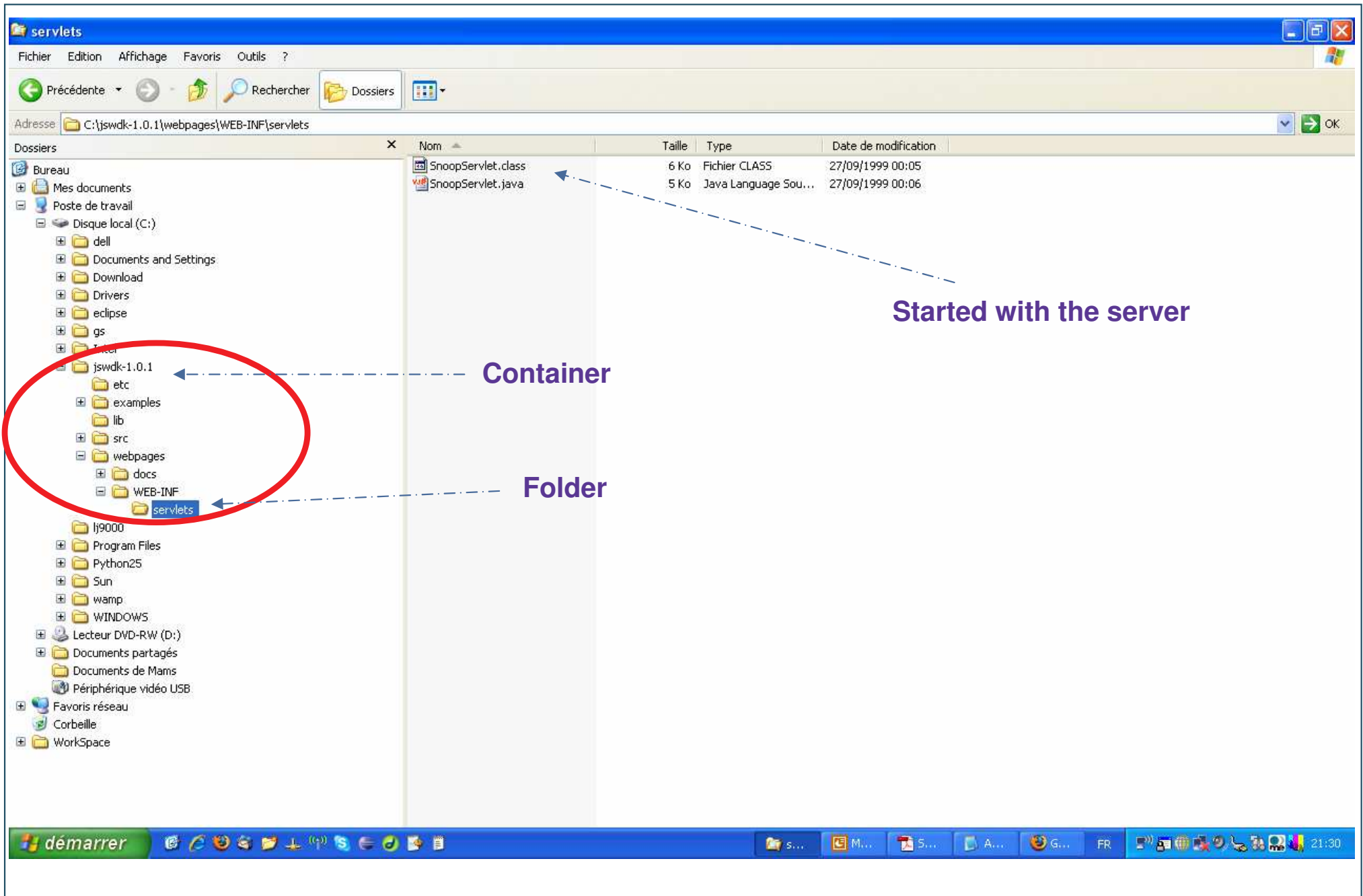


The screenshot displays a Windows Explorer window with the following structure:

- Dossiers (Left Pane):**
 - Bureau
 - Mes documents
 - Poste de travail
 - Disque local (C:)
 - dell
 - Documents and Settings
 - Download
 - Drivers
 - eclipse
 - gs
 - Intel
 - jswdk-1.0.1** (Selected and circled in red)
 - etc
 - examples
 - lib
 - src
 - webpages

- Nom (Right Pane):**
- etc
- examples
- lib
- src
- webpages
- FAQ.html
- LICENSE.txt
- README.html
- startserver
- startserver.bat
- stopserver
- stopserver.bat
- webserver.jar
- webserver.xml

Two dashed arrows point from the text **Server control** to the **startserver.bat** and **stopserver.bat** files in the right pane.



The screenshot shows a Windows Explorer window titled 'servlets' with the address bar set to 'C:\jswdk-1.0.1\webpages\WEB-INF\servlets'. The left pane displays a tree view of the file system, where the folder 'jswdk-1.0.1' is circled in red. The right pane shows a list of files:

Nom	Taille	Type	Date de modification
SnoopServlet.class	6 Ko	Fichier CLASS	27/09/1999 00:05
SnoopServlet.java	5 Ko	Java Language Sou...	27/09/1999 00:06

Annotations with arrows point to specific elements:

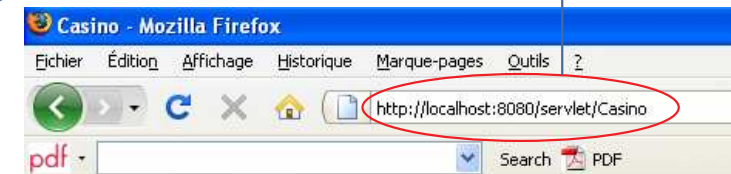
- Started with the server**: Points to the 'SnoopServlet.class' and 'SnoopServlet.java' files.
- Container**: Points to the 'jswdk-1.0.1' folder in the left pane.
- Folder**: Points to the 'servlets' folder in the left pane.

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

public class Casino extends HttpServlet {
    static final private String CONTENT_TYPE = "text/html";

    public void service(HttpServletRequest query, HttpServletResponse answer)
    throws ServletException, IOException {
        answer.setContentType(CONTENT_TYPE);
        PrintWriter out = answer.getWriter();
        int n = 6, m = 49;

        out.println("<html>");
        out.println("<head><title>Casino</title></head>");
        out.println("<body>");
        out.println("<h1>Welcome loser !</h1>");
        out.println("<p>Today is <b>" + (new Date()).toString() + "</b></p>");
        out.println("<p><b>The wining martingale is:</b></p>");
        Random r =new Random();
        out.println("<table border=1><tr align=center>");
        for(int i = 0; i < n; i++) out.print("<th> Draw #" + (i+1) + " </th>");
        out.print("</tr>");
        for (int i = 0; i < n; i++) {
            out.print("<tr align=center>");
            for(int j = 0; j < n; j++) out.print("<td>" + r.nextInt(m) + "</td>");
            out.println("</tr>");
        }
        out.println("</tr></table>");
        out.println("</body></html>");
    }
}
```



Welcome loser !

Today is Thu Oct 29 18:22:16 CET 2009

The wining martingale is:

Draw #1	Draw #2	Draw #3	Draw #4	Draw #5	Draw #6
14	3	21	45	4	17
21	41	9	17	10	27
15	40	26	15	8	29
22	15	27	16	38	32
11	13	46	9	40	5
34	3	5	36	0	17



- **Using URL**

`http://serverName/servlet/servletName`

- **Passing parameters**

`http://serverName/servlet/servletName?parameterName=value&...`

- **Using link**

`'Go'`

- **Using form**

`<FORM Method=Get Action= http://serverName/servlet/servletName`

`...`

`<INPUT TYPE=submit NAME='Go'>`

`</FORM>`



Servlet > Passing parameters

M. K. Traoré

```
<FORM Method=Post Action= http://localhost:8080/servlet/AirLine>
  <INPUT TYPE=text NAME='City'>
  <INPUT TYPE=submit NAME='Go'>
</FORM>
```

```
public void doPost(HttpServletRequest query, HttpServletResponse answer)
throws ServletException, IOException {
    // ...
    ... query.getParameter("City") ...
}
```

http://localhost:8080/servlet/AirLine?City=value

```
<FORM Method=Get Action= http://localhost:8080/servlet/AirLine>
  <INPUT TYPE=text NAME='City'>
  <INPUT TYPE=submit NAME='Go'>
</FORM>
```

OR

```
public void doGet(HttpServletRequest query, HttpServletResponse answer)
throws ServletException, IOException {
    // ...
    ... query.getParameter("City") ...
    //...
}
```

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

public class Horoscope extends HttpServlet {
    static final private String CONTENT_TYPE = "text/html";

    public void doPost(HttpServletRequest query, HttpServletResponse answer)
        throws ServletException, IOException {
        answer.setContentType(CONTENT_TYPE); PrintWriter out = answer.getWriter();
        String sign = "unknown";

        int jj = Integer.parseInt(query.getParameter("BirthDay"));
        String mm = query.getParameter("BirthMonth");

        if ( ((mm.compareTo("Mar") == 0) && (jj >= 20)) || ((mm.compareTo("Apr") == 0) && (jj <= 20))) sign = "Aries";
        if ( ((mm.compareTo("Apr") == 0) && (jj >= 21)) || ((mm.compareTo("May") == 0) && (jj <= 21))) sign = "Taurus";
        if ( ((mm.compareTo("May") == 0) && (jj >= 22)) || ((mm.compareTo("Jun") == 0) && (jj <= 21))) sign = "Gemini";
        if ( ((mm.compareTo("Jun") == 0) && (jj >= 22)) || ((mm.compareTo("Jul") == 0) && (jj <= 22))) sign = "Cancer";
        if ( ((mm.compareTo("Jul") == 0) && (jj >= 23)) || ((mm.compareTo("Aug") == 0) && (jj <= 22))) sign = "Leo";
        if ( ((mm.compareTo("Aug") == 0) && (jj >= 23)) || ((mm.compareTo("Sep") == 0) && (jj <= 22))) sign = "Virgo";
        if ( ((mm.compareTo("Sep") == 0) && (jj >= 23)) || ((mm.compareTo("Oct") == 0) && (jj <= 22))) sign = "Libra";
        if ( ((mm.compareTo("Oct") == 0) && (jj >= 23)) || ((mm.compareTo("Nov") == 0) && (jj <= 22))) sign = "Scorpio";
        if ( ((mm.compareTo("Nov") == 0) && (jj >= 23)) || ((mm.compareTo("Dec") == 0) && (jj <= 21))) sign = "Sagittarius";
        if ( ((mm.compareTo("Dec") == 0) && (jj >= 22)) || ((mm.compareTo("Jan") == 0) && (jj <= 20))) sign = "Capricorn";
        if ( ((mm.compareTo("Jan") == 0) && (jj >= 21)) || ((mm.compareTo("Feb") == 0) && (jj <= 19))) sign = "Aquarius";
        if ( ((mm.compareTo("Feb") == 0) && (jj >= 20)) || ((mm.compareTo("Mar") == 0) && (jj <= 19))) sign = "Pisces";

        out.println("<html>"); out.println("<head><title>Horoscope</title></head>"); out.println("<body>");
        out.println("<h2>" + query.getParameter("FirstName") + "</h2>");
        out.println("<p>You're " + "<h1>" + sign + "</h1><b></b></p>"); out.println("</body></html>");
    }

    public void doGet(HttpServletRequest query, HttpServletResponse answer)
        throws ServletException, IOException {
        doPost(query, answer);
    }
}
```

Welcome to T2C2 (The True Clairvoyance Centre)

First name :

Birth day (dd) :

Birth month (mm) :

horoscope.html

`<form method="post" action="http://localhost:8080/servlet/Horoscope">`

← → □ ⚡

http://localhost:8080/servlet/Horoscope

Man

You're

Gemini


```
public class Post extends HttpServlet {

    public void doGet(HttpServletRequest query, HttpServletResponse answer) throws IOException, ServletException {
        answer.setContentType("text/html");
        PrintWriter pw = answer.getWriter();
        pw.println("<html>");
        pw.println("<head>");
        pw.println("<title>Some HttpServletRequest methods</title>");
        pw.println("</head>");
        pw.println("<body>");
        pw.println("<h3>HttpServletRequest methods</h3>");
        pw.println("<table>");
        pw.println("<tr><td colspan='2' align='center' bgcolor='lightgreen'>");
        pw.println("<b>Information about the request</b></td></tr>");
        pw.println("<tr>");
        pw.println("<td><b>Action:</b></td>");
        pw.println("<td>" + query.getMethod() + "</td>");
        pw.println("</tr><tr>");
        pw.println("<td><b>URI:</b></td>");
        pw.println("<td>" + query.getRequestURI() + "</td>");
        pw.println("</tr><tr>");
        pw.println("<td><b>Protocol:</b></td>");
        pw.println("<td>" + query.getProtocol() + "</td>");
        pw.println("</tr><tr>");
        pw.println("<td><b>Path:</b></td>");
        pw.println("<td valign='bottom'>" + query.getPathInfo() + "</td>");
        pw.println("</tr><tr>");
        pw.println("<td><b>Client's IP:</b></td>");
        pw.println("<td>" + query.getRemoteAddr() + "</td>");
        pw.println("</tr>");
        pw.println("<tr><td colspan='2' align='center' bgcolor='lightgreen'>");
        pw.println("<b>En-têtes</b></td></tr>");
        Enumeration e = query.getHeaderNames();
        while (e.hasMoreElements()) {
            String nm = (String)e.nextElement();
            String val = query.getHeader(nm);
            pw.println("<tr><td valign='top'><b>" + nm + "</b></td>");
            pw.println("<td>" + val + "</td></tr>");
        }
        pw.println("</table>");
        pw.println("</body>");
        pw.println("</html>");
    }
}
```

Request tracing

Best language :

Java

Best platform :

Eclipse

Best engineer :

Me

Send

Post?pr1=Java&pr2=Eclipse&pr3=Me'

post.html

HttpServletRequest methods

Information about the request

Action: POST
URI: /servlet/Post
Protocol: HTTP/1.1
Path: null
Client's IP: 127.0.0.1

En-têtes

Accept: image/gif, image/x-bitmap, image/jpeg, image/pjpeg, application/x-shockwave-flash, application/xhtml+xml, application/vnd.ms-xpsdocument, application/x-ms-bap, application/x-ms-application, application/vnd.ms-excel, application/vnd.ms-powerpoint, application/msword, */*
Accept-Language: fr
Content-Type: application/x-www-form-urlencoded
UA-CPU: x86
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1; .NET CLR 1.1.4322; .NET CLR 2.0.50727; .NET CLR 3.0.04506.30; .NET CLR 3.0.4506.2152; .NET CLR 3.5.30729)
Host: localhost:8080
Content-Length: 27
Connection: Keep-Alive
Cache-Control: no-cache

HttpServletRequest methods

Information about the request

Action: GET
URI: /servlet/Post
Protocol: HTTP/1.1
Path: null
Client's IP: 127.0.0.1

En-têtes

Accept: image/gif, image/x-bitmap, image/jpeg, image/pjpeg, application/x-shockwave-flash, application/xhtml+xml, application/vnd.ms-xpsdocument, application/x-ms-bap, application/x-ms-application, application/vnd.ms-excel, application/vnd.ms-powerpoint, application/msword, */*
Accept-Language: fr
UA-CPU: x86
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1; .NET CLR 1.1.4322; .NET CLR 2.0.50727; .NET CLR 3.0.04506.30; .NET CLR 3.0.4506.2152; .NET CLR 3.5.30729)
Host: localhost:8080
Connection: Keep-Alive



- **Issue** = http protocol is disconnected (discrete interactions)
- **Session** = memory that kept the illusion of continuous interaction
- **Solutions:**
 - hidden field with a specific value defined per client by the servlet
 - **cookie**: information file saved at client side with limited life-time
 - **httpSession** object: information file saved at server side

HttpServletRequest method

getCookies(): array of all the cookies stored by the client

Cookie methods

Cookie(name, value): information file with a name and a content

getName(): name of the cookie

getValue(): content of the cookie

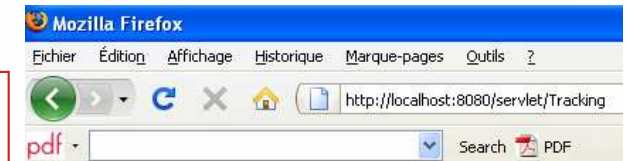
HttpServletResponse method

addCookie(Cookie): save the cookie at the client side

```
public class Tracking extends HttpServlet {
```

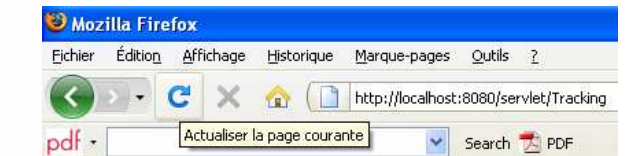
```
    public void doPost(HttpServletRequest query, HttpServletResponse answer) throws IOException, ServletException {
        answer.setContentType("text/html");
        PrintWriter pw = answer.getWriter();
        String id = null;
        Cookie[] cookies = query.getCookies();
        Cookie cookie = null;
        if (cookies != null) {
            for (int i = 0; i < cookies.length; i++) {
                if (cookies[i].getName().equals("TrackMaster")) {
                    cookie = cookies[i];
                    id = cookie.getValue();
                    break;
                }
            }
        }
        if (id == null) id = new String("");
        else id = id + "";
        answer.addCookie(new Cookie("TrackMaster", id));
        pw.print("<html>");
        pw.print("<body bgcolor='white'>");
        pw.print("<h1>This is your visit #</h1>");
        pw.print("<h2>" + id.length() + "</h2>");
        pw.print("</body>");
        pw.print("</html>");
    }
}
```

```
    public void doGet(HttpServletRequest query, HttpServletResponse answer) throws IOException, ServletException {
        doPost(query, answer);
    }
}
```



This is your visit #

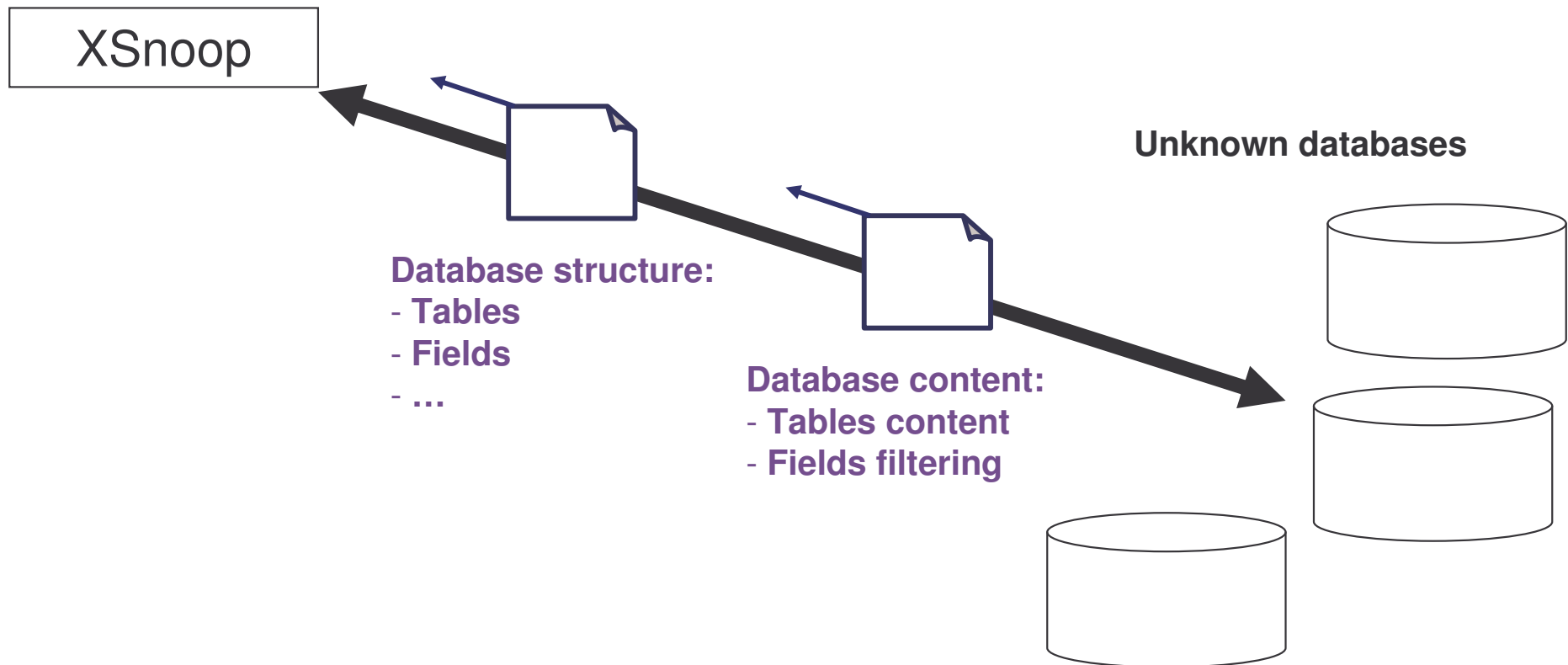
1



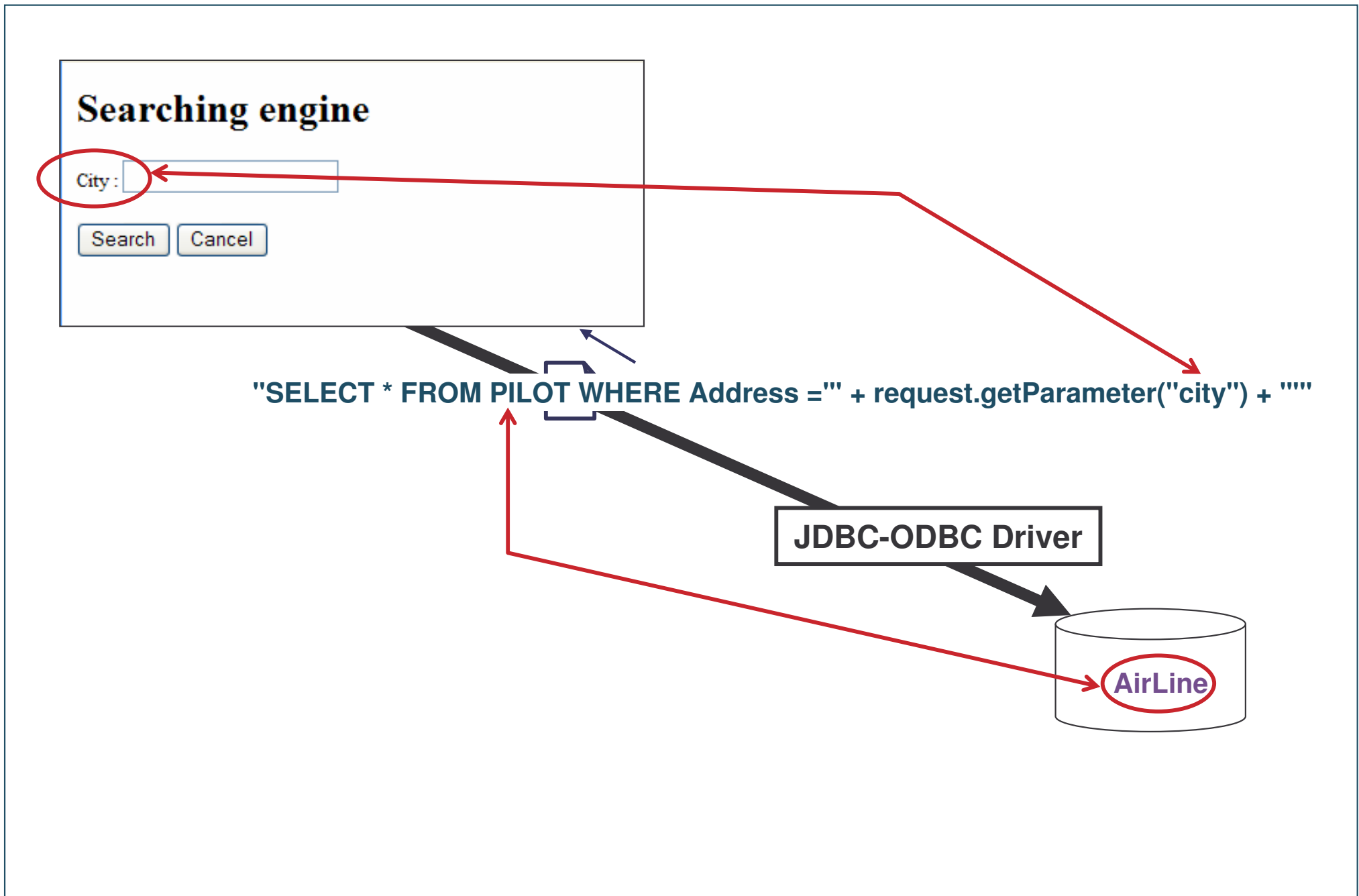
This is your visit #

2

- **Expert Snooper: connects to any database and get back information about it's content**



- **Code available here: XSnoop servlet, XSnoop interface, former airline database**
- **Deliverables: improved servlet and user interface**



- **Three improvements:**
- **The database is user-defined in the interface:**
 - dynamic listing of existing tables
 - dynamic listing of existing fields
- **Queries are dynamically constructed:**
 - **SELECT** field list **FROM** table **WHERE** condition list
 - field list: fields are separated by commas; use “*” to get all fields
 - condition ::= field operator value
 - operator ::= >, <, =, <=, >=, <>
 - condition list: conditions are separated by “AND”
- **A user-friendly interface is expected:**
 - query and results are separately displayed on the same sheet
 - user can return to the main page for a new search