Method	Description
`void init( ServletConfig config )`	This method is automatically called once during a servlet's execution cycle to initialize the servlet. The `ServletConfig` argument is supplied automatically by the server that executes the servlet.
`ServletConfig getServletConfig()`	This method returns a reference to an object that implements interface `ServletConfig`. This object provides access to the servlet's configuration information such as initialization parameters and the servlet's `ServletContext`, which provides the servlet with access to its environment (i.e., the server in which the servlet is executing).
`void service( ServletRequest request, ServletResponse response )`	This is the first method called on every servlet to respond to a client request.
`String getServletInfo()`	This method is defined by a servlet programmer to return a `String` containing servlet information such as the servlet's author and version.
`void destroy()`	This "cleanup" method is called when a servlet is terminated by the server on which it is executing. This is a good method to use to deallocate a resource used by the servlet (such as an open file or an open database connection).

Fig. 19.1 Methods of interface `Servlet`.

Method	Description
`doDelete`	Called in response to an HTTP ***DELETE*** request. Such a request is normally used to delete a file from the server. This may not be available on some servers because of its inherent security risks.
`doOptions`	Called in response to an HTTP ***OPTIONS*** request. This returns information to the client indicating the HTTP options supported by the server.
`doPut`	Called in response to an HTTP ***PUT*** request. Such a request is normally used to store a file on the server. This may not be available on some servers because of its inherent security risks.
`doTrace`	Called in response to an HTTP ***TRACE*** request. Such a request is normally used for debugging. The implementation of this method automatically returns an HTML document to the client containing the request header information (data sent by the browser as part of the request).

Fig. 19.2 Important methods of class **`HttpServlet`**.

Method	Description
`String getParameter( String name )`	Returns the value associated with a parameter sent to the servlet as part of a `GET` or `POST` request. The `name` argument represents the parameter name.
`Enumeration getParameterNames()`	Returns the names of all the parameters sent to the servlet as part of a `POST` request.
`String[] getParameterValues( String name )`	Returns an array of `String`s containing the values for a specified servlet parameter.
`Cookie[] getCookies()`	Returns an array of `Cookie` objects stored on the client by the server. `Cookie`s can be used to uniquely identify clients to the servlet.
`HttpSession getSession( boolean create )`	Returns an `HttpSession` object associated with the client's current browsing session. An `HttpSession` object can be created by this method (`true` argument) if an `HttpSession` object does not already exist for the client. `HttpSession` objects can be used in similar ways to `Cookie`s for uniquely identifying clients.

Fig. 19.3 Important methods of interface `HttpServletRequest`.

Method	Description
`void addCookie( Cookie cookie )`	Used to add a **`Cookie`** to the header of the response to the client. The **`Cookie`**'s maximum age and whether the client allows **`Cookie`**s to be saved determine whether or not **`Cookie`**s will be stored on the client.
`ServletOutputStream getOutputStream()`	Obtains a byte-based output stream that enables binary data to be sent to the client.
`PrintWriter getWriter()`	Obtains a character-based output stream that enables text data to be sent to the client.
`void setContentType( String type )`	Specifies the MIME type of the response to the browser. The MIME type helps the browser determine how to display the data (or possibly what other application to execute to process the data). For example, MIME type **`"text/html"`** indicates that the response is an HTML document, so the browser displays the HTML page.

Fig. 19.4 Important methods of **`HttpServletResponse`**.

```
1  // Fig. 19.5: HTTPGetServlet.java
2  // Creating and sending a page to the client
3  import javax.servlet.*;
4  import javax.servlet.http.*;
5  import java.io.*;
6
7  public class HTTPGetServlet extends HttpServlet {
8     public void doGet( HttpServletRequest request,
9                        HttpServletResponse response )
10       throws ServletException, IOException
11    {
12       PrintWriter output;
13
14       response.setContentType( "text/html" );  // content type
15       output = response.getWriter();           // get writer
16
17       // create and send HTML page to client
18       StringBuffer buf = new StringBuffer();
19       buf.append( "<HTML><HEAD><TITLE>\n" );
20       buf.append( "A Simple Servlet Example\n" );
21       buf.append( "</TITLE></HEAD><BODY>\n" );
22       buf.append( "<H1>Welcome to Servlets!</H1>\n" );
23       buf.append( "</BODY></HTML>" );
24       output.println( buf.toString() );
25       output.close();    // close PrintWriter stream
26    }
27 }
```

Fig. 19.5 The **`HTTPGetServlet`**, which processes an HTTP **`GET`** request.

```
<!-- Fig. 19.6: HTTPGetServlet.html -->
<HTML>
   <HEAD>
      <TITLE>
         Servlet HTTP GET Example
      </TITLE>
   </HEAD>
   <BODY>
      <FORM
         ACTION="http://localhost:8080/servlet/HTTPGetServlet"
         METHOD="GET">
         <P>Click the button to have the servlet send
            an HTML document</P>
         <INPUT TYPE="submit" VALUE="Get HTML Document">
      </FORM>
   </BODY>
</HTML>
```

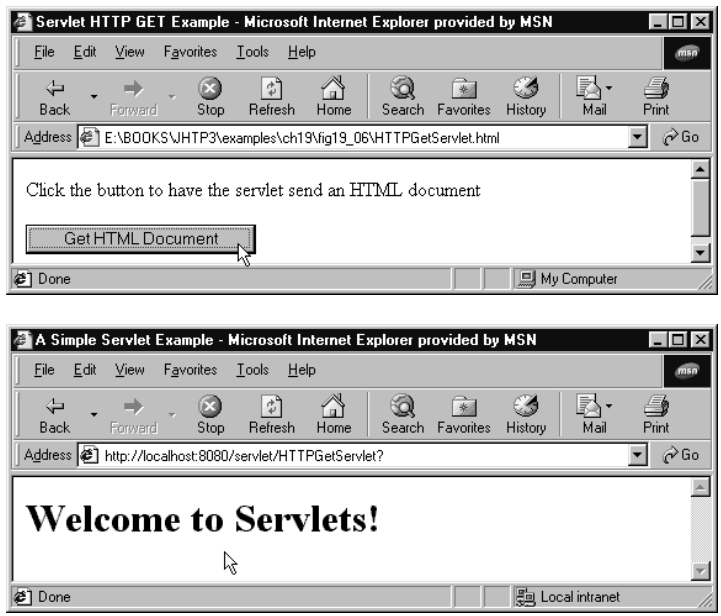


Fig. 19.6 HTML document to issue a **GET** request to **HTTPGetServlet**.

```
1  // Fig. 19.7: HTTPPostServlet.java
2  // A simple survey servlet
3  import javax.servlet.*;
4  import javax.servlet.http.*;
5  import java.text.*;
6  import java.io.*;
7  import java.util.*;
8
9  public class HTTPPostServlet extends HttpServlet {
10    private String animalNames[] =
11       { "dog", "cat", "bird", "snake", "none" };
12
13    public void doPost( HttpServletRequest request,
14                        HttpServletResponse response )
15       throws ServletException, IOException
16    {
17       int animals[] = null, total = 0;
18       File f = new File( "survey.txt" );
19
20       if ( f.exists() ) {
21          // Determine # of survey responses so far
22          try {
23             ObjectInputStream input = new ObjectInputStream(
24                new FileInputStream( f ) );
25
26             animals = (int []) input.readObject();
27             input.close();   // close stream
28
29             for ( int i = 0; i < animals.length; ++i )
30                total += animals[ i ];
31          }
32          catch( ClassNotFoundException cnfe ) {
33             cnfe.printStackTrace();
34          }
35       }
36       else
37          animals = new int[ 5 ];
38
39       // read current survey response
40       String value =
41          request.getParameter( "animal" );
42       ++total;   // update total of all responses
43
44       // determine which was selected and update its total
45       for ( int i = 0; i < animalNames.length; ++i )
46          if ( value.equals( animalNames[ i ] ) )
47             ++animals[ i ];
48
49       // write updated totals out to disk
50       ObjectOutputStream output = new ObjectOutputStream(
51          new FileOutputStream( f ) );
52
```

Fig. 19.7 The **HTTPPostServlet** that processes an HTTP **POST** request (part 1 of 2).

```
53          output.writeObject( animals );
54          output.flush();
55          output.close();
56
57          // Calculate percentages
58          double percentages[] = new double[ animals.length ];
59
60          for ( int i = 0; i < percentages.length; ++i )
61             percentages[ i ] = 100.0 * animals[ i ] / total;
62
63          // send a thank you message to client
64          response.setContentType( "text/html" ); // content type
65
66          PrintWriter responseOutput = response.getWriter();
67          StringBuffer buf = new StringBuffer();
68          buf.append( "<html>\n" );
69          buf.append( "<title>Thank you!</title>\n" );
70          buf.append( "Thank you for participating.\n" );
71          buf.append( "<BR>Results:\n<PRE>" );
72
73          DecimalFormat twoDigits = new DecimalFormat( "#0.00" );
74          for ( int i = 0; i < percentages.length; ++i ) {
75             buf.append( "<BR>" );
76             buf.append( animalNames[ i ] );
77             buf.append( ": " );
78             buf.append( twoDigits.format( percentages[ i ] ) );
79             buf.append( "%  responses: " );
80             buf.append( animals[ i ] );
81             buf.append( "\n" );
82          }
83
84          buf.append( "\n<BR><BR>Total responses: " );
85          buf.append( total );
86          buf.append( "</PRE>\n</html>" );
87
88          responseOutput.println( buf.toString() );
89          responseOutput.close();
90       }
91    }
```

Fig. 19.7 The **`HTTPPostServlet`** that processes an HTTP **`POST`** request (part 2 of 2).

```
1  <!-- Fig. 19.8: HTTPPostServlet.html -->
2  <HTML>
3     <HEAD>
4        <TITLE>Servlet HTTP Post Example</TITLE>
5     </HEAD>
6
7     <BODY>
8        <FORM METHOD="POST" ACTION=
9           "http://localhost:8080/servlet/HTTPPostServlet">
10          What is your favorite pet?<BR><BR>
11          <INPUT TYPE=radio NAME=animal VALUE=dog>Dog<BR>
12          <INPUT TYPE=radio NAME=animal VALUE=cat>Cat<BR>
13          <INPUT TYPE=radio NAME=animal VALUE=bird>Bird<BR>
14          <INPUT TYPE=radio NAME=animal VALUE=snake>Snake<BR>
15          <INPUT TYPE=radio NAME=animal VALUE=none CHECKED>None
16          <BR><BR><INPUT TYPE=submit VALUE="Submit">
17          <INPUT TYPE=reset>
18       </FORM>
19    </BODY>
20 </HTML>
```

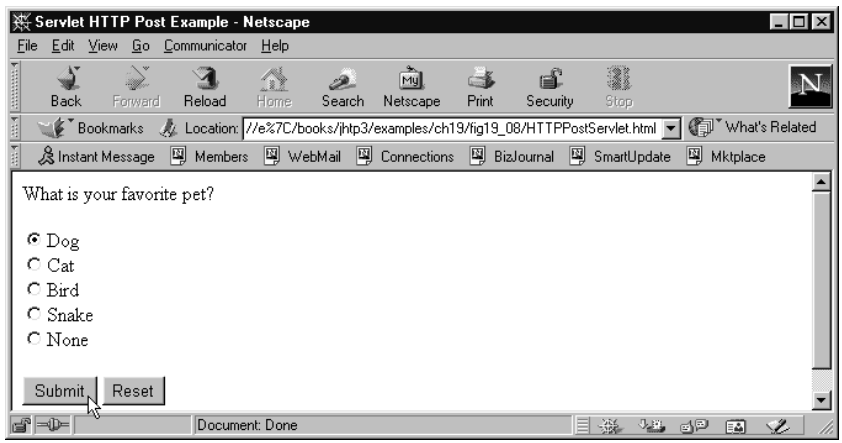


Fig. 19.8 Issuing a **POST** request to **HTTPPostServlet** (part 1 of 2).

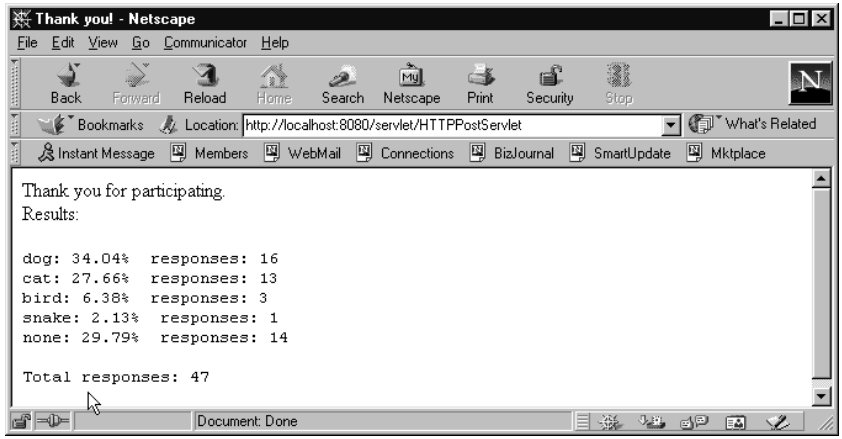


Fig. 19.8 Issuing a **`POST`** request to **`HTTPPostServlet`** (part 2 of 2).

```
1  // Fig. 19.9: CookieExample.java
2  // Using cookies.
3  import javax.servlet.*;
4  import javax.servlet.http.*;
5  import java.io.*;
6
7  public class CookieExample extends HttpServlet {
8     private String names[] = { "C", "C++", "Java",
9                                "Visual Basic 6" };
10    private String isbn[] = {
11       "0-13-226119-7", "0-13-528910-6",
12       "0-13-012507-5", "0-13-528910-6" };
13
14    public void doPost( HttpServletRequest request,
15                        HttpServletResponse response )
16       throws ServletException, IOException
17    {
18       PrintWriter output;
19       String language = request.getParameter( "lang" );
20
21       Cookie c = new Cookie( language, getISBN( language ) );
22       c.setMaxAge( 120 );  // seconds until cookie removed
23       response.addCookie( c );  // must precede getWriter
24
25       response.setContentType( "text/html" );
26       output = response.getWriter();
27
28       // send HTML page to client
29       output.println( "<HTML><HEAD><TITLE>" );
30       output.println( "Cookies" );
31       output.println( "</TITLE></HEAD><BODY>" );
32       output.println( "<P>Welcome to Cookies!<BR>" );
33       output.println( "<P>" );
34       output.println( language );
35       output.println( " is a great language." );
36       output.println( "</BODY></HTML>" );
37
38       output.close();    // close stream
39    }
40
41    public void doGet( HttpServletRequest request,
42                       HttpServletResponse response )
43                       throws ServletException, IOException
44    {
45       PrintWriter output;
46       Cookie cookies[];
47
48       cookies = request.getCookies(); // get client's cookies
49
50       response.setContentType( "text/html" );
51       output = response.getWriter();
52
```

Fig. 19.9 Demonstrating **`Cookie`**s (part 1 of 2).

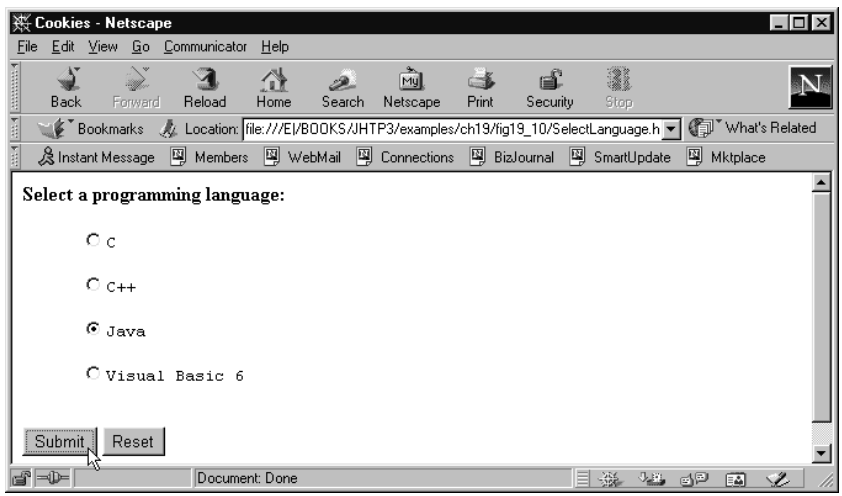
```
53          output.println( "<HTML><HEAD><TITLE>" );
54          output.println( "Cookies II" );
55          output.println( "</TITLE></HEAD><BODY>" );
56
57          if ( cookies != null ) {
58             output.println( "<H1>Recommendations</H1>" );
59
60             // get the name of each cookie
61             for ( int i = 0; i < cookies.length; i++ )
62                output.println(
63                   cookies[ i ].getName() + " How to Program. " +
64                   "ISBN#: " + cookies[ i ].getValue() + "<BR>" );
65          }
66          else {
67             output.println( "<H1>No Recommendations</H1>" );
68             output.println( "You did not select a language or" );
69             output.println( "the cookies have expired." );
70          }
71
72          output.println( "</BODY></HTML>" );
73          output.close();    // close stream
74       }
75
76       private String getISBN( String lang )
77       {
78          for ( int i = 0; i < names.length; ++i )
79             if ( lang.equals( names[ i ] ) )
80                return isbn[ i ];
81
82          return "";  // no matching string found
83       }
84    }
```

Fig. 19.9 Demonstrating `Cookie`s (part 2 of 2).

```
<!-- Fig. 19.10: SelectLanguage.html -->
<HTML>
<HEAD>
   <TITLE>Cookies</TITLE>
</HEAD>
```

Fig. 19.10 HTML document that invokes the cookie servlet with a **POST** request and passes the user's language selection as an argument (part 1 of 2).

```
<BODY>
   <FORM ACTION="http://localhost:8080/servlet/CookieExample"
         METHOD="POST">
      <STRONG>Select a programming language:<br>
      </STRONG><BR>
      <PRE>
      <INPUT TYPE="radio" NAME="lang" VALUE="C">C<BR>
      <INPUT TYPE="radio" NAME="lang" VALUE="C++">C++<BR>
      <INPUT TYPE="radio" NAME="lang" VALUE="Java"
             CHECKED>Java<BR>
      <INPUT TYPE="radio" NAME="lang"
             VALUE="Visual Basic 6">Visual Basic 6
      </PRE>
      <INPUT TYPE="submit" VALUE="Submit">
      <INPUT TYPE="reset"> </P>
   </FORM>
</BODY>
</HTML>
```



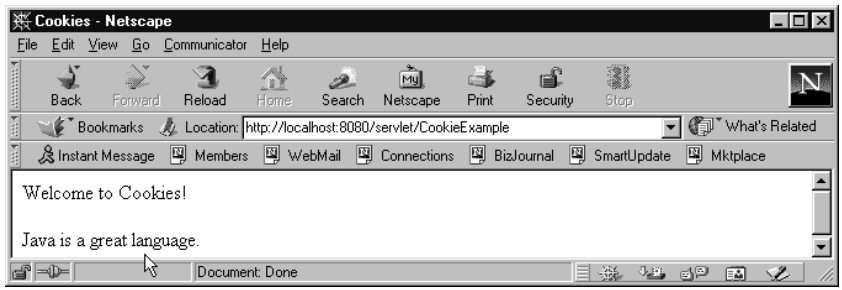


Fig. 19.10 HTML document that invokes the cookie servlet with a **`POST`** request and passes the user's language selection as an argument (part 2 of 2).

```
<!-- Fig. 19.11: BookRecommendation.html -->
<HTML>
<HEAD>
   <TITLE>Cookies</TITLE>
</HEAD>
<BODY>
   <FORM ACTION="http://localhost:8080/servlet/CookieExample"
         METHOD="GET">
      Press "Recommend books" for a list of books.
      <INPUT TYPE=submit VALUE="Recommend books">
   </FORM>
</BODY>
</HTML>
```

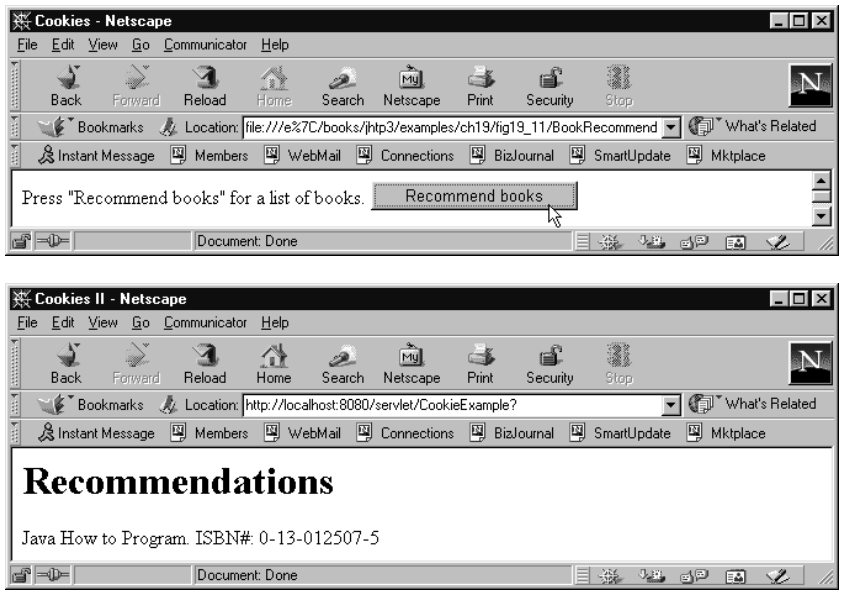


Fig. 19.11 HTML document for a servlet that reads a client's cookies (part 1 of 2).

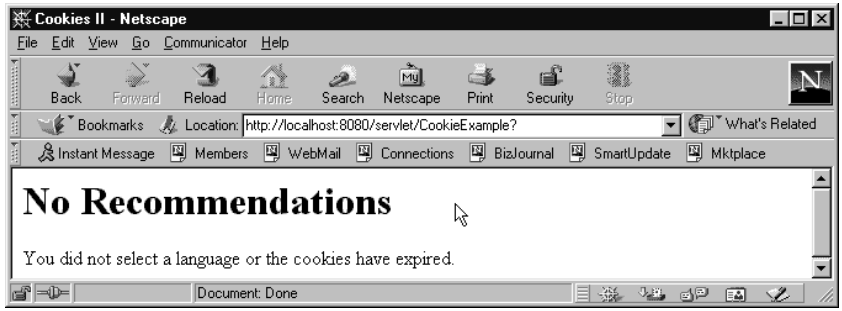


Fig. 19.11 HTML document for a servlet that reads a client's cookies (part 2 of 2).

Method	Description
`getComment()`	Returns a `String` describing the purpose of the cookie (`null` if no comment has been set with `setComment`).
`getDomain()`	Returns a `String` containing the cookie's domain. This determines which servers can receive the cookie. By default cookies are sent to the server that originally sent the cookie to the client.
`getMaxAge()`	Returns an `int` representing the maximum age of the cookie in seconds.
`getName()`	Returns a `String` containing the name of the cookie as set by the constructor.
`getPath()`	Returns a `String` containing the URL prefix for the cookie. Cookies can be "targeted" to specific URLs that include directories on the Web server. By default a cookie is returned to services operating in the same directory as the service that sent the cookie or a subdirectory of that directory.
`getSecure()`	Returns a `boolean` value indicating if the cookie should be transmitted using a secure protocol (`true`).
`getValue()`	Returns a `String` containing the value of the cookie as set with `setValue` or the constructor.
`getVersion()`	Returns an `int` containing the version of the cookie protocol used to create the cookie. Cookies are currently undergoing standardization. A value of 0 (the default) indicates the original cookie protocol as defined by Netscape. A value of 1 indicates the version currently undergoing standardization.
`setComment( String )`	The comment describing the purpose of the cookie that is presented by the browser to the user (some browsers allow the user to accept cookies on a per-cookie basis).
`setDomain( String )`	This determines which servers can receive the cookie. By default cookies are sent to the server that originally sent the cookie to the client. The domain is specified in the form `".deitel.com"`, indicating that all servers ending with `.deitel.com` can receive this cookie.
`setMaxAge( int )`	Sets the maximum age of the cookie in seconds.
`setPath( String )`	Sets the "target" URL indicating the directories on the server that lead to the services that can receive this cookie.
`setSecure( boolean )`	A `true` value indicates that the cookie should only be sent using a secure protocol.
`setValue( String )`	Sets the value of a cookie.
`setVersion( int )`	Sets the cookie protocol for this cookie.

Fig. 19.12 Important methods of class `Cookie`.

```
1  // Fig. 19.13: SessionExample.java
2  // Using sessions.
3  import javax.servlet.*;
4  import javax.servlet.http.*;
5  import java.io.*;
6
7  public class SessionExample extends HttpServlet {
8     private final static String names[] =
9        { "C", "C++", "Java", "Visual Basic 6" };
10    private final static String isbn[] = {
11       "0-13-226119-7", "0-13-528910-6",
12       "0-13-012507-5", "0-13-528910-6" };
13
14    public void doPost( HttpServletRequest request,
15                        HttpServletResponse response )
16       throws ServletException, IOException
17    {
18       PrintWriter output;
19       String language = request.getParameter( "lang" );
20
21       // Get the user's session object.
22       // Create a session (true) if one does not exist.
23       HttpSession session = request.getSession( true );
24
25       // add a value for user's choice to session
26       session.putValue( language, getISBN( language ) );
27
28       response.setContentType( "text/html" );
29       output = response.getWriter();
30
31       // send HTML page to client
32       output.println( "<HTML><HEAD><TITLE>" );
33       output.println( "Sessions" );
34       output.println( "</TITLE></HEAD><BODY>" );
35       output.println( "<P>Welcome to Sessions!<BR>" );
36       output.println( "<P>" );
37       output.println( language );
38       output.println( " is a great language." );
39       output.println( "</BODY></HTML>" );
40
41       output.close();    // close stream
42    }
43
44    public void doGet( HttpServletRequest request,
45                       HttpServletResponse response )
46                       throws ServletException, IOException
47    {
48       PrintWriter output;
49
50       // Get the user's session object.
51       // Don't create a session (false) if one does not exist.
52       HttpSession session = request.getSession( false );
53
```

Fig. 19.13 Session tracking example (part 1 of 2).

```
54          // get names of session object's values
55          String valueNames[];
56
57          if ( session != null )
58             valueNames = session.getValueNames();
59          else
60             valueNames = null;
61
62          response.setContentType( "text/html" );
63          output = response.getWriter();
64
65          output.println( "<HTML><HEAD><TITLE>" );
66          output.println( "Sessions II" );
67          output.println( "</TITLE></HEAD><BODY>" );
68
69          if ( valueNames != null && valueNames.length != 0 ) {
70             output.println( "<H1>Recommendations</H1>" );
71
72             // get value for each name in valueNames
73             for ( int i = 0; i < valueNames.length; i++ ) {
74                String value =
75                   (String) session.getValue( valueNames[ i ] );
76
77                output.println(
78                   valueNames[ i ] + " How to Program. " +
79                   "ISBN#: " + value + "<BR>" );
80             }
81          }
82          else {
83             output.println( "<H1>No Recommendations</H1>" );
84             output.println( "You did not select a language or" );
85             output.println( "the session has expired." );
86          }
87
88          output.println( "</BODY></HTML>" );
89          output.close();    // close stream
90       }
91
92       private String getISBN( String lang )
93       {
94          for ( int i = 0; i < names.length; ++i )
95             if ( lang.equals( names[ i ] ) )
96                return isbn[ i ];
97
98          return "";  // no matching string found
99       }
100   }
```

Fig. 19.13 Session tracking example (part 2 of 2).

```
<!-- Fig. 19.14: SelectLanguage.html -->
<HTML>
<HEAD>
   <TITLE>Sessions</TITLE>
</HEAD>
<BODY>
   <FORM ACTION="http://localhost:8080/servlet/SessionExample"
         METHOD="POST">
      <STRONG>Select a programming language:<br>
      </STRONG><BR>
      <PRE>
      <INPUT TYPE="radio" NAME="lang" VALUE="C">C<BR>
      <INPUT TYPE="radio" NAME="lang" VALUE="C++">C++<BR>
      <INPUT TYPE="radio" NAME="lang" VALUE="Java"
             CHECKED>Java<BR>
      <INPUT TYPE="radio" NAME="lang"
             VALUE="Visual Basic 6">Visual Basic 6
      </PRE>
      <INPUT TYPE="submit" VALUE="Submit">
      <INPUT TYPE="reset"> </P>
   </FORM>
</BODY>
</HTML>
```

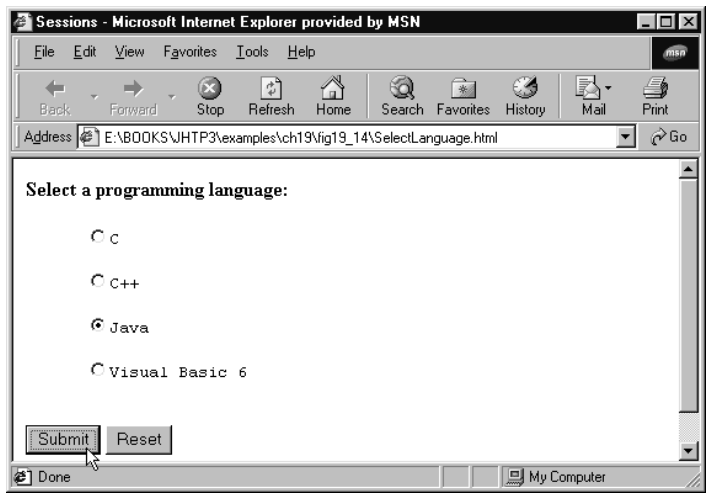


Fig. 19.14 HTML document that invokes the session tracking servlet with a **POST** request and passes the language selection as an argument (part 1 of 2).

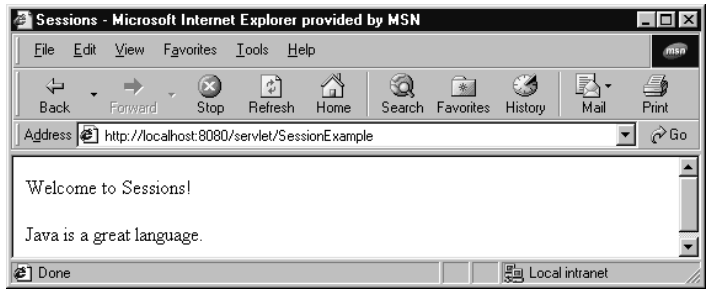


Fig. 19.14 HTML document that invokes the session tracking servlet with a **`POST`** request and passes the language selection as an argument (part 2 of 2).

```
1  <!-- Fig. 19.15: BookRecommendation.html -->
2  <HTML>
3  <HEAD>
4     <TITLE>Sessions</TITLE>
5  </HEAD>
6  <BODY>
7     <FORM ACTION="http://localhost:8080/servlet/SessionExample"
8           METHOD="GET">
9        Press "Recommend books" for a list of books.
10       <INPUT TYPE=submit VALUE="Recommend books">
11    </FORM>
12 </BODY>
13 </HTML>
```

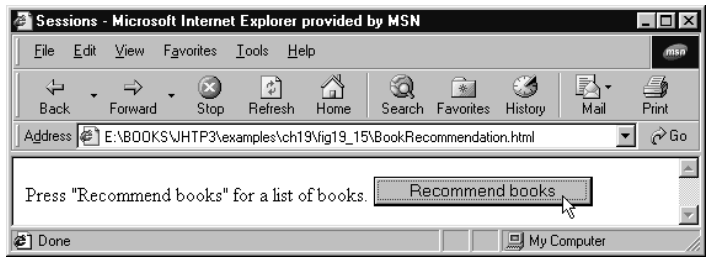


Fig. 19.15 HTML that interacts with the session tracking servlet to read the session information and return book recommendations to the user (part 1 of 2).

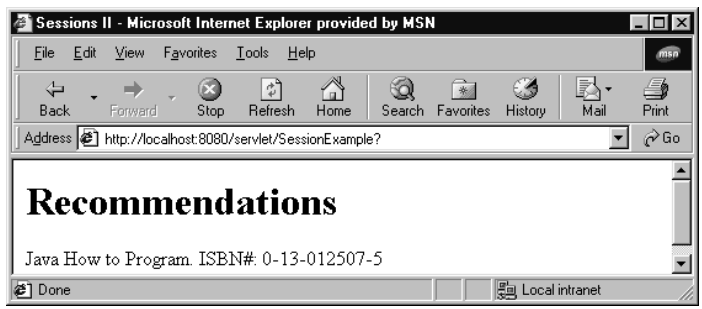


Fig. 19.15 HTML that interacts with the session tracking servlet to read the session information and return book recommendations to the user (part 2 of 2).

```
1  // Fig. 19.16: GuestBookServlet.java
2  // Three-Tier Example
3  import java.io.*;
4  import javax.servlet.*;
5  import javax.servlet.http.*;
6  import java.util.*;
7  import java.sql.*;
8
9  public class GuestBookServlet extends HttpServlet {
10    private Statement statement = null;
11    private Connection connection = null;
12    private String URL = "jdbc:odbc:GuestBook";
13
14    public void init( ServletConfig config )
15       throws ServletException
16    {
17       super.init( config );
18
19       try {
20          Class.forName( "sun.jdbc.odbc.JdbcOdbcDriver" );
21          connection =
22             DriverManager.getConnection( URL, "", "" );
23       }
24       catch ( Exception e ) {
25          e.printStackTrace();
26          connection = null;
27       }
28    }
29
30    public void doPost( HttpServletRequest req,
31                        HttpServletResponse res )
32       throws ServletException, IOException
33    {
34       String email, firstName, lastName, company,
35              snailmailList, cppList, javaList, vbList,
36              iwwwList;
37
38       email = req.getParameter( "Email" );
39       firstName = req.getParameter( "FirstName" );
40       lastName = req.getParameter( "LastName" );
```

Fig. 19.16 **`GuestBookServlet`**, which allows client to register for mailing lists (part 1 of 3).

```
41       company = req.getParameter( "Company" );
42       snailmailList = req.getParameter( "mail" );
43       cppList = req.getParameter( "c_cpp" );
44       javaList = req.getParameter( "java" );
45       vbList = req.getParameter( "vb" );
46       iwwwList = req.getParameter( "iwww" );
47
48       PrintWriter output = res.getWriter();
49       res.setContentType( "text/html" );
```

```
50
51          if ( email.equals( "" ) ||
52               firstName.equals( "" ) ||
53               lastName.equals( "" ) ) {
54             output.println( "<H3> Please click the back " +
55                             "button and fill in all " +
56                             "fields.</H3>" );
57             output.close();
58             return;
59          }
60
61          /* Note: The GuestBook database actually contains fields
62           * Address1, Address2, City, State and Zip that are not
63           * used in this example. However, the insert into the
64           * database must still account for these fields. */
65          boolean success = insertIntoDB(
66             "'" + email + "','" + firstName + "','" + lastName +
67             "','" + company + "',' ',' ',' ',' ',' ','" +
68             ( snailmailList != null ? "yes" : "no" ) + "','" +
69             ( cppList != null ? "yes" : "no"  ) + "','" +
70             ( javaList != null ? "yes" : "no"  ) + "','" +
71             ( vbList != null ? "yes" : "no"  ) + "','" +
72             ( iwwwList != null ? "yes" : "no"  ) + "'" );
73
74          if ( success )
75             output.print( "<H2>Thank you " + firstName +
76                           " for registering.</H2>" );
77          else
78             output.print( "<H2>An error occurred. " +
79                           "Please try again later.</H2>" );
80
81          output.close();
82       }
83
84       private boolean insertIntoDB( String stringtoinsert )
85       {
86          try {
87             statement = connection.createStatement();
88             statement.execute(
89                "INSERT INTO GuestBook values (" +
90                stringtoinsert + ");" );
91             statement.close();
92          }
```

Fig. 19.16 `GuestBookServlet`, which allows client to register for mailing lists (part 2 of 3).

```
93          catch ( Exception e ) {
94             System.err.println(
95                "ERROR: Problems with adding new entry" );
96             e.printStackTrace();
97             return false;
98          }
99
100         return true;
```

```
101     }
102
103     public void destroy()
104     {
105        try {
106           connection.close();
107        }
108        catch( Exception e ) {
109           System.err.println( "Problem closing the database" );
110        }
111     }
112  }
```

Fig. 19.16 **`GuestBookServlet`**, which allows client to register for mailing lists (part 3 of 3).

```
<!-- Fig. 19.17: GuestBookForm.html -->
<HTML>
<HEAD>
   <TITLE>Deitel Guest Book Form</TITLE>
</HEAD>

<BODY>
   <H1>Guest Book</H1>
   <FORM
      ACTION=http://localhost:8080/servlet/GuestBookServlet
      METHOD=POST><PRE>
      * Email address: <INPUT TYPE=text NAME=Email>
      * First Name:    <INPUT TYPE=text NAME=FirstName>
      * Last name:     <INPUT TYPE=text NAME=LastName>
      Company:         <INPUT TYPE=text NAME=Company>

                       * fields are required
      </PRE>

      <P>Select mailing lists from which you want
      to receive information<BR>
      <INPUT TYPE=CHECKBOX NAME=mail VALUE=mail>
         Snail Mail<BR>
      <INPUT TYPE=CHECKBOX NAME=c_cpp VALUE=c_cpp>
         <I>C++ How to Program & C How to Program</I><BR>
      <INPUT TYPE=CHECKBOX NAME=java VALUE=java>
         <I>Java How to Program</I><BR>
      <INPUT TYPE=CHECKBOX NAME=vb VALUE=vb>
         <I>Visual Basic How to Program</I><BR>
```

Fig. 19.17 HTML that invokes the **`GuestBookServlet`** (part 1 of 2).

```
      <INPUT TYPE=CHECKBOX NAME=iwww VALUE=iwww>
         <I>Internet and World Wide Web How to Program</I><BR>
      </P>
      <INPUT TYPE=SUBMIT Value="Submit">
   </FORM>
</BODY>
</HTML>
```

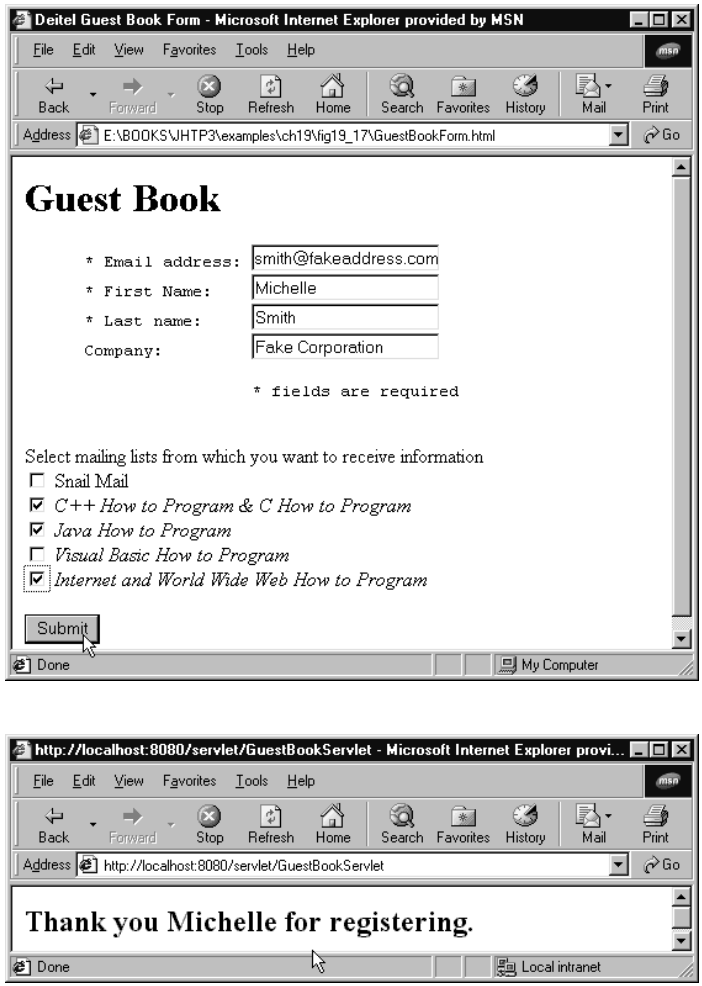


Fig. 19.17 HTML that invokes the **`GuestBookServlet`** (part 2 of 2).