

## 'My own HTTP' server sample

Let's create an empty Java project, Then create files called *404.html* and an *index.html* with the following content. Let's note that the error handling is redundant, i.e. the handling of *errors 404* and *501* is written twice.

**Task:** create a generic error handling function to return errors to the client side.

Content of *404.html*:

```
<html>
  <body>
    <h1>File not found error</h1>
  </body>
</html>
```

Content of *index.html*:

```
<html>
<body>
<h1>My HTTP server works</h1>
<a href="/dead_link.html">Link not working</a>
</body>
</html>
```

Content of *JavaHTTPServer.java*:

```
import java.io.BufferedOutputStream;
import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.PrintWriter;
import java.net.ServerSocket;
import java.net.Socket;
import java.util.Date;
import java.util.StringTokenizer;

public class JavaHTTPServer implements Runnable {

    static final File WEB_ROOT = new File(".");
    static final String DEFAULT_FILE = "index.html";
```

```
static final String FILE_NOT_FOUND = "404.html";

private Socket connect;

public JavaHTTPServer(Socket c) {
    connect = c;
}

public static void main(String[] args) {
    try {
        ServerSocket serverConnect = new ServerSocket(8080);
        System.out.println("Server started.\nListening for connections
on port : 8080 ... \n");

        while (true) {
            JavaHTTPServer myServer = new
JavaHTTPServer(serverConnect.accept());

            Thread thread = new Thread(myServer);
            thread.start();
        }
    } catch (IOException e) {
        System.err.println("Server Connection error : " +
e.getMessage());
    }
}

@Override
public void run() {
    BufferedReader in = null;
    PrintWriter out = null;
    BufferedOutputStream dataOut = null;
    String fileRequested = null;

    try {
        in = new BufferedReader(new
InputStreamReader(connect.getInputStream()));
        out = new PrintWriter(connect.getOutputStream());
        dataOut = new BufferedOutputStream(connect.getOutputStream());

        String input = in.readLine();

        StringTokenizer parse = new StringTokenizer(input);
        String method = parse.nextToken().toUpperCase(); // we get the
HTTP method of the client
        // we get file requested
        fileRequested = parse.nextToken().toLowerCase();

        // we support only GET and HEAD methods, we check
if (method.equals("GET") || method.equals("HEAD")) {
```

```
        // GET or HEAD method
        if (fileRequested.endsWith("/")) {
            fileRequested += DEFAULT_FILE;
        }

        File file = new File(WEB_ROOT, fileRequested);
        int fileLength = (int) file.length();
        String content = getContentType(fileRequested);

        if (method.equals("GET")) { // GET method so we return
content
            byte[] fileData = readFileData(file, fileLength);

            // send HTTP Headers
            out.println("HTTP/1.1 200 OK");
            out.println("Server: Java HTTP Server v1.0");
            out.println("Date: " + new Date());
            out.println("Content-type: " + content);
            out.println("Content-length: " + fileLength);
            out.println(); // blank line between headers and
content, very important !
            out.flush(); // flush character output stream buffer

            dataOut.write(fileData, 0, fileLength);
            dataOut.flush();
        }
    }

    } catch (FileNotFoundException fnfe) {
        try {
            fileNotFound(out, dataOut, fileRequested);
        } catch (IOException ioe) {
            System.err.println("Error with file not found exception : "
+ ioe.getMessage());
        }

    } catch (IOException ioe) {
        System.err.println("Server error : " + ioe);
    } finally {
        try {
            in.close();
            out.close();
            dataOut.close();
            connect.close(); // we close socket connection
        } catch (Exception e) {
            System.err.println("Error closing stream : " +
e.getMessage());
        }
    }
}
}
```

```
private byte[] readFileData(File file, int fileLength) throws
IOException {
    FileInputStream fileIn = null;
    byte[] fileData = new byte[fileLength];

    try {
        fileIn = new FileInputStream(file);
        fileIn.read(fileData);
    } finally {
        if (fileIn != null)
            fileIn.close();
    }

    return fileData;
}

// return supported MIME Types
private String getContentType(String fileRequested) {
    if (fileRequested.endsWith(".htm") ||
fileRequested.endsWith(".html"))
        return "text/html";
    else
        return "text/plain";
}

private void fileNotFound(PrintWriter out, OutputStream dataOut, String
fileRequested) throws IOException {
    File file = new File(WEB_ROOT, FILE_NOT_FOUND);
    int fileLength = (int) file.length();
    String content = "text/html";
    byte[] fileData = readFileData(file, fileLength);

    out.println("HTTP/1.1 404 File Not Found");
    out.println("Server: Java HTTP Server v1.0");
    out.println("Date: " + new Date());
    out.println("Content-type: " + content);
    out.println("Content-length: " + fileLength);
    out.println(); // blank line between headers and content, very
important !
    out.flush(); // flush character output stream buffer

    dataOut.write(fileData, 0, fileLength);
    dataOut.flush();
}
}
```

**Task:** refactor the code and eliminate duplicate parts. Let's create a separate function to return a general HTTP response::

```
out.println("HTTP/1.1 200 OK");
out.println("Server: Java HTTP Server v1.0");
out.println("Date: " + new Date());
out.println("Content-type: " + content);
out.println("Content-length: " + fileLength);
out.println(); // blank line between headers and content, very important !
out.flush(); // flush character output stream buffer
```

**Task:** modify the source code so that it can also return images. To do this, first add `` to `index.html` and copy an arbitrary image next to the `html-s..`

From:

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Last update: **2024/03/04 08:09**

