

# CS380 — Exercise 8

March 8, 2017

Due: Wednesday, March 15, 2017 before midnight (60 points)

You are allowed to work with a partner to complete this exercise. If you do work with a partner, only one person should create the codebank project and add the other as a member with at least developer privilege. You should also include a comment at the top of any source code files with both partners' names to ensure grades are entered correctly.

## Preparing the Project

Create a repository on <https://codebank.xyz> named CS380-EX8.

Create a Java file named `WebServer.java` that contains a main class named `WebServer`. You should also create a folder named `www` inside of the working directory of the program that will contain our HTML files. Inside of that folder, add the following basic test file named `hello.html`:

```
<html>
<head>
  <title>Hello, World!</title>
</head>
<body>
  <p>
    Hello, World!
  </p>
</body>
</html>
```

If you want, you can add any additional files for testing purposes.

## The Program

In this exercise, you will create a simple web server. You only need to implement two HTTP responses but can implement more if you desire.

## HTTP Request

HTTP is a text-based request-response protocol that runs on top of TCP. Our server will only handle `GET` requests. A `GET` request has the following form:

```
GET PATH HTTP/1.1
HeaderKey: HeaderValue
...
[blank line]
```

You should read lines of text from the client until you read a blank line. All preceding lines were part of the same request. The `PATH` is the location of the file being requested by the client.

Here is an example request for our sample file:

```
GET /hello.html HTTP/1.1
Host: localhost:8080
```

## HTTP Response

Once we determine the path for the file requested, we check to see if the file exists. We look for files within our web root directory, which should be called `www` and located in the working directory of the web server.

If the file does exist, we should send a `200 OK` response along with the file content. For example:

```
HTTP/1.1 200 OK
Content-type: text/html
Content-length: 124
```

```
<html>
<head>
  <title>Hello, World!</title>
</head>
<body>
  <p>
    Hello, World!
  </p>
</body>
</html>
```

If the file does not exist, we should send a `404 Not Found` response along with the content to display on the page for the user, for example:

```
HTTP/1.1 404 Not Found
Content-type: text/html
Content-length: 126
```

```
<html>
<head>
  <title>Not Found</title>
</head>
<body>
  Sorry, the object you requested was not found.
```

```
</body>  
<html>
```

## Testing

To test your program, run the web server listening on port 8080. Note: HTTP normally runs on port 80, however on some operating systems we need administrative privilege to listen on the “privileged ports” which are the ports below 1024. To avoid this, we’ll use 8080 instead.

You can then open any web browser and browse to `localhost:8080/hello.html` or to some other file name that does not exist to test the 404 response.

## Submission

Push your code to `https://codebank.xyz` as you did with all previous projects and exercises. You can push as many times as desired before the deadline.