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Final Lab Project Report

Description of what we did and why we did it:

In the main program, a garbage collector, httpservicemanager and htttprequestmanager were created. Also, a tcpserver socket was created and initialized. After that the main program runs as a demon, receives connections and makes transactions using multi-threading.

There were many more services provided other than the one that were provided originally. All of them looked alike implementation-wise for the setHeader method that was used to set the content-type header(mime type) to the type of the resource provided so that the browser can render it correctly. The only ones that were different were the form and the XML since they required parsing to extract the data form the URL encoding.

Some middleware is implemented in the HTTPServiceManager class to allow the appropriate service object to be created using the resource type. This middleware is implemented using a map called services.

The POST, GET and HEAD methods all inherited from the httprequest class. In order to prevent the body from being sent in the case of the HEAD method, an if condition is put before writing the body to socket in any type of service. That condition guarantees that the body is only sent in case the method used is not HEAD.

Cache Experiment results:

The cache was implemented by a binary heap. When a file is looked for, it can be a new file can be inserted to the cache. This file can be already existing. Or the file can be new and the cache is full so the least used item has to be removed from the binary heap so that the new file can be added. Below is an of an experiment carried out with this cache and the following is what was printed on the terminal of the server.

```
File Name:/test.txt
New file created
File Name:/apache-logo.png
New file created
File Name:/apache-logo.png
File already created
File Name:/apache-logo.jpg
New file created
File Name:/apache-logo.jpg
File already created
File Name:/apache-logo.gif
Cache full
deleting minimum and creating new file
File Name:/apache-logo.gif
File already created
File Name:/coding.gif
Cache full
deleting minimum and creating new file
File Name:/coding.gif
File already created
```