Project 1

Part1: Concurrency HTTP 1.0 server handling GET and HEAD

- We choose JAVA for implementation. Please check Server.java, ClientHandler.java, and GetMime.java.

Part2: Bonus

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- Benchmarking your server using httpf

  An example of using httpf is displayed as follow,

```
httperf --client=0/1 --server=192.168.0.100 --port=8080 --uri=/ --rate=150 --send-buffer=4096
6384 --num-conns=2000 --num-calls=1
httperf: warning: open file limit > FD_SETSIZE; limiting max. # of open files to FD_SETSIZE
Maximum connect burst length: 1

Total: connections 2000 requests 2000 replies 2000 test-duration 13.448 s

Connection rate: 148.7 conn/s (6.7 ms/conn, <=9 concurrent connections)
Connection time [ms]: min 1.1 avg 25.4 max 211.2 median 3.5 stddev 62.7
Connection time [ms]: connect 0.8
Connection length [replies/conn]: 1.000

Request rate: 148.7 req/s (6.7 ms/req)
Request size [B]: 66.0

Reply rate [replies/s]: min 149.4 avg 149.6 max 149.8 stddev 0.3 (2 samples)
Reply time [ms]: response 2.3 transfer 22.3
Reply size [B]: header 77.0 content 70.0 footer 0.0 (total 147.0)
Reply status: 1xx=0 2xx=0 3xx=0 4xx=2000 5xx=0

CPU time [s]: user 1.87 system 10.73 (user 13.9% system 79.8% total 93.6%)
Net I/O: 31.1 KB/s (0.3*10^6 bps)

Errors: total 0 client-timo 0 socket-timo 0 connrefused 0 connreset 0
Errors: fd-unavail 0 addrunavail 0 ftab-full 0 other 0
```

NumConn = 2000

Request Rate[1/s]	Reply Rate[1/s]	Response Time (ms)
100	99.9	2.8
150	149.6	2.3
200	199.2	2.5
300	299.0	3.4
400	398.2	1.3
500		Seqmentation Fault

- ♦ Observation
  - From the result displayed above, we may conclude the as the quest rate increased, the response time is nearly the same
  - As we push the request rate up to 500 s^{-1} , there is segmentation fault occurred.