

Luna Szymanski

Project 1

Build Instructions

1. Open a terminal, navigate to my src, then type `"java MapServer.java 13000"`
2. Choose connection type (tcp or udp). Note that you can use any port you want
3. Open a terminal, go to my src, then type `"java MapClient.java localhost 13000 command?key?value"`
4. Choose a connection type (tcp or udp). Note you can use ipaddress instead of the localhost name, and you can use a different port. Just make sure it matches server. Also even if you do not use the value field you need to have the third argument with both "?" delimiters. Key /value cannot have a space in them.
5. Close server using ctrl+c

Executive Summary

I decided to do both TCP and UDP in one java program, and I ask for input on the type of connection being requested. The server can be run in two modes at the same time but different ports must be used. I decided to communicate different commands using a delimiter "?" to separate the command name from the key /value. I tried to use "\$" but that did not work because bash reads that as a variable call but i found "?" to be fine. The command can be uppercase or lowercase as I convert it to upper case before using. I used a hashmap on the server to store key,value pairs.

For Testing I ran the TCP server and client and I put a few words into my map, then i used the get command to grab some definitions and also got the response for a failed get. I then deleted a few terms that do exist, and failed to delete a term that was not there. Finally I used get on a term I deleted to prove it was deleted. There are screenshots of this included in this pdf. If you want to test the timeout you need to uncomment the sleep command in MapServer.java in the runTCPServer() function.

For UDP I ran the same set of tests. I threw in a few tests for malformed data packets but I could not find an effective way to do this. I was thinking about using the socket command of setting the buffer size of the socket, so that I could use that to check if what I am getting is the same size as was expected. This did not work.

***note Server is on left, Client is on right**

TCP:

```
lunas-MacBook-Pro:src luna$ java MapServer.java 13800
(03/02/2020 22:36:34) Are you using TCP or UDP?
tcp
(03/02/2020 22:36:34) Looking for connection using TCP Mode
(03/02/2020 22:36:53) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58720
(03/02/2020 22:36:53) Received message from Client: put chicken yummy
(03/02/2020 22:36:53) Added chicken to dictionary
(03/02/2020 22:37:10) Looking for connection using TCP Mode
(03/02/2020 22:37:21) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58721
(03/02/2020 22:37:10) Received message from Client: PUT puppy fun
(03/02/2020 22:37:10) Added puppy to dictionary
(03/02/2020 22:37:10) Looking for connection using TCP Mode
(03/02/2020 22:37:21) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58723
(03/02/2020 22:37:21) Received message from Client: put donkey funny
(03/02/2020 22:37:21) Added donkey to dictionary
(03/02/2020 22:37:23) Looking for connection using TCP Mode
(03/02/2020 22:37:48) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58725
(03/02/2020 22:37:48) Received message from Client: put candy awesome
(03/02/2020 22:37:48) Added candy to dictionary
(03/02/2020 22:37:48) Looking for connection using TCP Mode
(03/02/2020 22:38:06) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58726
(03/02/2020 22:38:06) Received message from Client: put candy bad
(03/02/2020 22:38:06) Could not PUT candy because it already exists. Please DELETE first.
(03/02/2020 22:38:06) Looking for connection using TCP Mode
(03/02/2020 22:38:42) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58729
(03/02/2020 22:38:42) Received message from Client: PUT apple healthy
(03/02/2020 22:38:42) Added apple to dictionary
(03/02/2020 22:38:42) Looking for connection using TCP Mode
(03/02/2020 22:39:06) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58742
(03/02/2020 22:39:06) Received message from Client: get candy
(03/02/2020 22:39:06) Definition found for [candy]: awesome
(03/02/2020 22:39:06) Looking for connection using TCP Mode
(03/02/2020 22:39:23) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58743
(03/02/2020 22:39:23) Received message from Client: get apple
(03/02/2020 22:39:23) Definition found for [apple]: healthy
(03/02/2020 22:39:23) Looking for connection using TCP Mode
(03/02/2020 22:39:44) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58744
(03/02/2020 22:39:44) Received message from Client: get chicken
(03/02/2020 22:39:44) Definition found for [chicken]: yummy
(03/02/2020 22:39:44) Looking for connection using TCP Mode
(03/02/2020 22:39:57) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58745
(03/02/2020 22:39:57) Received message from Client: get beer
(03/02/2020 22:39:57) No Definition found for [beer]
(03/02/2020 22:39:57) Looking for connection using TCP Mode
(03/02/2020 22:40:23) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58747
(03/02/2020 22:40:23) Received message from Client: delete candy
(03/02/2020 22:40:23) Removed key [candy]
(03/02/2020 22:40:23) Looking for connection using TCP Mode
(03/02/2020 22:40:23) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58748
(03/02/2020 22:40:23) Received message from Client: delete candy
(03/02/2020 22:40:23) No Definition found for [candy]
(03/02/2020 22:40:31) Looking for connection using TCP Mode
(03/02/2020 22:40:31) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58749
(03/02/2020 22:40:31) Received message from Client: delete chicken
(03/02/2020 22:40:31) Removed key [chicken]
(03/02/2020 22:40:49) Looking for connection using TCP Mode
(03/02/2020 22:41:10) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58750
(03/02/2020 22:41:10) Received message from Client: delete apple
(03/02/2020 22:41:10) Removed key [apple]
(03/02/2020 22:41:10) Looking for connection using TCP Mode
(03/02/2020 22:41:40) Found connection from Host Address: 127.0.0.1, Host Name: localhost, Port: 58753
(03/02/2020 22:41:40) Received message from Client: delete donkey
(03/02/2020 22:41:40) Removed key [donkey]

lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 put?chicken?yummy
(03/02/2020 22:36:51) Are you using TCP or UDP?
tcp
(03/02/2020 22:36:53) Sent message to server: put?chicken?yummy
(03/02/2020 22:36:53) Reply received: Added chicken to dictionary
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 PUT?puppy?fun
(03/02/2020 22:37:08) Are you using TCP or UDP?
tcp
(03/02/2020 22:37:10) Sent message to server: PUT?puppy?fun
(03/02/2020 22:37:10) Reply received: Added puppy to dictionary
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 put?donkey?funny
(03/02/2020 22:37:20) Are you using TCP or UDP?
tcp
(03/02/2020 22:37:21) Sent message to server: put?donkey?funny
(03/02/2020 22:37:21) Reply received: Added donkey to dictionary
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 put?candy?awesome
(03/02/2020 22:37:46) Are you using TCP or UDP?
tcp
(03/02/2020 22:37:48) Sent message to server: put?candy?awesome
(03/02/2020 22:37:48) Reply received: Added candy to dictionary
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 put?candy?bad
(03/02/2020 22:38:04) Are you using TCP or UDP?
tcp
(03/02/2020 22:38:06) Sent message to server: put?candy?bad
(03/02/2020 22:38:06) Reply received: Could not PUT candy because it already exists. Please DELETE first.
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 PUT?apple?healthy
(03/02/2020 22:38:40) Are you using TCP or UDP?
tcp
(03/02/2020 22:38:42) Sent message to server: PUT?apple?healthy
(03/02/2020 22:38:42) Reply received: Added apple to dictionary
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 get?candy?
(03/02/2020 22:39:04) Are you using TCP or UDP?
tcp
(03/02/2020 22:39:06) Sent message to server: get?candy?
(03/02/2020 22:39:06) Reply received: Definition found for [candy]: awesome
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 get?apple?
(03/02/2020 22:39:22) Are you using TCP or UDP?
tcp
(03/02/2020 22:39:23) Sent message to server: get?apple?
(03/02/2020 22:39:23) Reply received: Definition found for [apple]: healthy
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 get?chicken?
(03/02/2020 22:39:42) Are you using TCP or UDP?
tcp
(03/02/2020 22:39:44) Sent message to server: get?chicken?
(03/02/2020 22:39:44) Reply received: Definition found for [chicken]: yummy
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 get?beer?
(03/02/2020 22:39:54) Are you using TCP or UDP?
tcp
(03/02/2020 22:39:57) Sent message to server: get?beer?
(03/02/2020 22:39:57) Reply received: No Definition found for [beer]
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 delete?candy?
(03/02/2020 22:40:21) Are you using TCP or UDP?
tcp
(03/02/2020 22:40:23) Sent message to server: delete?candy?
(03/02/2020 22:40:23) Reply received: Removed key [candy]
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 delete?chicken?
(03/02/2020 22:40:29) Are you using TCP or UDP?
tcp
(03/02/2020 22:40:31) Sent message to server: delete?chicken?
(03/02/2020 22:40:31) Reply received: No Definition found for [candy]
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 delete?chicken?
(03/02/2020 22:40:46) Are you using TCP or UDP?
tcp
(03/02/2020 22:40:49) Sent message to server: delete?chicken?
(03/02/2020 22:40:49) Reply received: Removed key [chicken]
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 delete?apple?
(03/02/2020 22:41:08) Are you using TCP or UDP?
tcp
(03/02/2020 22:41:10) Sent message to server: delete?apple?
(03/02/2020 22:41:10) Reply received: Removed key [apple]
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 delete?donkey?
(03/02/2020 22:41:38) Are you using TCP or UDP?
tcp
(03/02/2020 22:41:40) Sent message to server: delete?donkey?
(03/02/2020 22:41:40) Reply received: Removed key [donkey]
lunas-MacBook-Pro:src luna$ java MacClient.java localhost 13800 get?donkey?
(03/02/2020 22:41:56) Are you using TCP or UDP?
tcp
(03/02/2020 22:41:58) Sent message to server: get?donkey?
(03/02/2020 22:41:58) Reply received: No Definition found for [donkey]
lunas-MacBook-Pro:src luna$
```

UDP:

```
lunas-MacBook-Pro:src luna$ java MapServer.java 13000
(03/02/2020 23:05:25) Are you using TCP or UDP?
udp
(03/02/2020 23:05:27) Looking for connection using UDP Mode
(03/02/2020 23:05:32) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56832
(03/02/2020 23:05:32) Received message from Client: put chicken yummy
(03/02/2020 23:05:32) Added chicken to dictionary
(03/02/2020 23:05:32) Looking for connection using UDP Mode
(03/02/2020 23:05:49) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56833
(03/02/2020 23:05:49) Received message from Client: PUT puppy fun
(03/02/2020 23:05:49) Added puppy to dictionary
(03/02/2020 23:05:49) Looking for connection using UDP Mode
(03/02/2020 23:06:18) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56834
(03/02/2020 23:06:18) Received message from Client: put donkey funny
(03/02/2020 23:06:18) Added donkey to dictionary
(03/02/2020 23:06:18) Looking for connection using UDP Mode
(03/02/2020 23:06:32) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56835
(03/02/2020 23:06:32) Received message from Client: put candy awesome
(03/02/2020 23:06:32) Added candy to dictionary
(03/02/2020 23:06:32) Looking for connection using UDP Mode
(03/02/2020 23:06:45) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56836
(03/02/2020 23:06:45) Received message from Client: put candy bad
(03/02/2020 23:06:45) Could not PUT candy because it already exists. Please DELETE first.
(03/02/2020 23:06:45) Looking for connection using UDP Mode
(03/02/2020 23:07:01) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56837
(03/02/2020 23:07:01) Received message from Client: PUT apple healthy
(03/02/2020 23:07:01) Added apple to dictionary
(03/02/2020 23:07:01) Looking for connection using UDP Mode
(03/02/2020 23:07:16) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56838
(03/02/2020 23:07:16) Received message from Client: get candy
(03/02/2020 23:07:16) Definition found for [candy]: awesome
(03/02/2020 23:07:16) Looking for connection using UDP Mode
(03/02/2020 23:07:31) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56839
(03/02/2020 23:07:31) Received message from Client: get apple
(03/02/2020 23:07:31) Definition found for [apple]: healthy
(03/02/2020 23:07:31) Looking for connection using UDP Mode
(03/02/2020 23:07:44) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56840
(03/02/2020 23:07:44) Received message from Client: get chicken
(03/02/2020 23:07:44) Definition found for [chicken]: yummy
(03/02/2020 23:07:44) Looking for connection using UDP Mode
(03/02/2020 23:07:55) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56841
(03/02/2020 23:07:55) Received message from Client: get beef
(03/02/2020 23:07:55) No Definition found for [beef]
(03/02/2020 23:07:55) Looking for connection using UDP Mode
(03/02/2020 23:08:16) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56842
(03/02/2020 23:08:16) Received message from Client: delete candy
(03/02/2020 23:08:16) Removed key [candy]
(03/02/2020 23:08:16) Looking for connection using UDP Mode
(03/02/2020 23:08:34) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56843
(03/02/2020 23:08:34) Received message from Client: delete chicken
(03/02/2020 23:08:34) Removed key [chicken]
(03/02/2020 23:08:34) Looking for connection using UDP Mode
(03/02/2020 23:08:47) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56844
(03/02/2020 23:08:47) Received message from Client: delete apple
(03/02/2020 23:08:47) Removed key [apple]
(03/02/2020 23:08:47) Looking for connection using UDP Mode
(03/02/2020 23:09:00) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56845
(03/02/2020 23:09:00) Received message from Client: delete donkey
(03/02/2020 23:09:00) Removed key [donkey]
(03/02/2020 23:09:00) Looking for connection using UDP Mode
(03/02/2020 23:09:27) Found connection: Host Address: 127.0.0.1, Host Name: localhost, Port: 56846
(03/02/2020 23:09:27) Received message from Client: get donkey
(03/02/2020 23:09:27) No Definition found for [donkey]
(03/02/2020 23:09:27) Looking for connection using UDP Mode
^Clunas-MacBook-Pro:src luna$

lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 put?chicken?yummy
(03/02/2020 23:02:58) Are you using TCP or UDP?
udp
(03/02/2020 23:03:01) Sent message to server: put?chicken?yummy
(03/02/2020 23:03:11) Timeout from server [10 seconds]
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 put?chicken?yummy
(03/02/2020 23:05:30) Are you using TCP or UDP?
udp
(03/02/2020 23:05:32) Sent message to server: put?chicken?yummy
(03/02/2020 23:05:32) Reply received: Added chicken to dictionary
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 PUT?puppy?fun
(03/02/2020 23:05:47) Are you using TCP or UDP?
udp
(03/02/2020 23:05:49) Sent message to server: PUT?puppy?fun
(03/02/2020 23:05:49) Reply received: Added puppy to dictionary
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 put?donkey?funny
(03/02/2020 23:06:15) Are you using TCP or UDP?
udp
(03/02/2020 23:06:18) Sent message to server: put?donkey?funny
(03/02/2020 23:06:18) Reply received: Added donkey to dictionary
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 put?candy?awesome
(03/02/2020 23:06:30) Are you using TCP or UDP?
udp
(03/02/2020 23:06:32) Sent message to server: put?candy?awesome
(03/02/2020 23:06:32) Reply received: Added candy to dictionary
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 put?candy?bad
(03/02/2020 23:06:42) Are you using TCP or UDP?
udp
(03/02/2020 23:06:45) Sent message to server: put?candy?bad
(03/02/2020 23:06:45) Reply received: Could not PUT candy because it already exists. Please DELETE
first.
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 PUT?apple?healthy
(03/02/2020 23:06:58) Are you using TCP or UDP?
udp
(03/02/2020 23:07:01) Sent message to server: PUT?apple?healthy
(03/02/2020 23:07:01) Reply received: Added apple to dictionary
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 get?candy?
(03/02/2020 23:07:13) Are you using TCP or UDP?
udp
(03/02/2020 23:07:16) Sent message to server: get?candy?
(03/02/2020 23:07:16) Reply received: Definition found for [candy]: awesome
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 get?apple?
(03/02/2020 23:07:27) Are you using TCP or UDP?
udp
(03/02/2020 23:07:31) Sent message to server: get?apple?
(03/02/2020 23:07:31) Reply received: Definition found for [apple]: healthy
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 get?chicken?
(03/02/2020 23:07:41) Are you using TCP or UDP?
udp
(03/02/2020 23:07:44) Sent message to server: get?chicken?
(03/02/2020 23:07:44) Reply received: Definition found for [chicken]: yummy
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 delete?beef?
(03/02/2020 23:07:53) Are you using TCP or UDP?
udp
(03/02/2020 23:07:55) Sent message to server: delete?beef?
(03/02/2020 23:07:55) Reply received: No Definition found for [beef]
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 delete?candy?
(03/02/2020 23:08:13) Are you using TCP or UDP?
udp
(03/02/2020 23:08:16) Sent message to server: delete?candy?
(03/02/2020 23:08:16) Reply received: Removed key [candy]
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 delete?chicken?
(03/02/2020 23:08:27) Are you using TCP or UDP?
udp
(03/02/2020 23:08:34) Sent message to server: delete?chicken?
(03/02/2020 23:08:34) Reply received: Removed key [chicken]
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 delete?apple?
(03/02/2020 23:08:44) Are you using TCP or UDP?
udp
(03/02/2020 23:08:47) Sent message to server: delete?apple?
(03/02/2020 23:08:47) Reply received: Removed key [apple]
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 delete?donkey?
(03/02/2020 23:08:57) Are you using TCP or UDP?
udp
(03/02/2020 23:09:00) Sent message to server: delete?donkey?
(03/02/2020 23:09:00) Reply received: Removed key [donkey]
lunas-MacBook-Pro:src luna$ java MapClient.java localhost 13000 get?donkey?
(03/02/2020 23:09:25) Are you using TCP or UDP?
udp
(03/02/2020 23:09:27) Sent message to server: get?donkey?
(03/02/2020 23:09:27) Reply received: No Definition found for [donkey]
lunas-MacBook-Pro:src luna$
```