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COP 5614 – Introduction to Operating Systems

Group 9 – Assignment 1

Professor Dong Chen

Wednesday February 13th

Testing, Performance and Latency

Testing

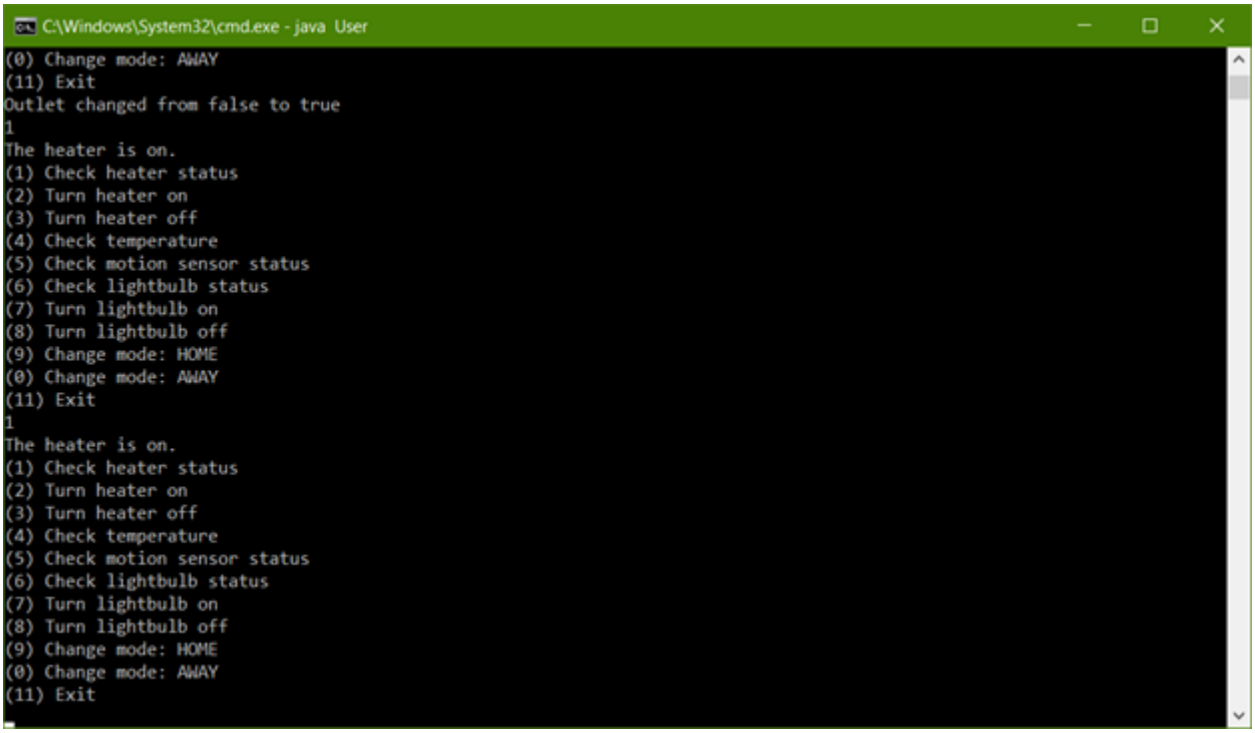
Test Case 1:

Input: User chooses option 1, “Check heater status”.

Pre-requisites: The server is running, User.java is connected to it, and the temperature is less than 1 degree Celsius.

Expected result: User receives a text message saying, “The heater is on”.

Actual result: User receives a text message saying, “The heater is on”.



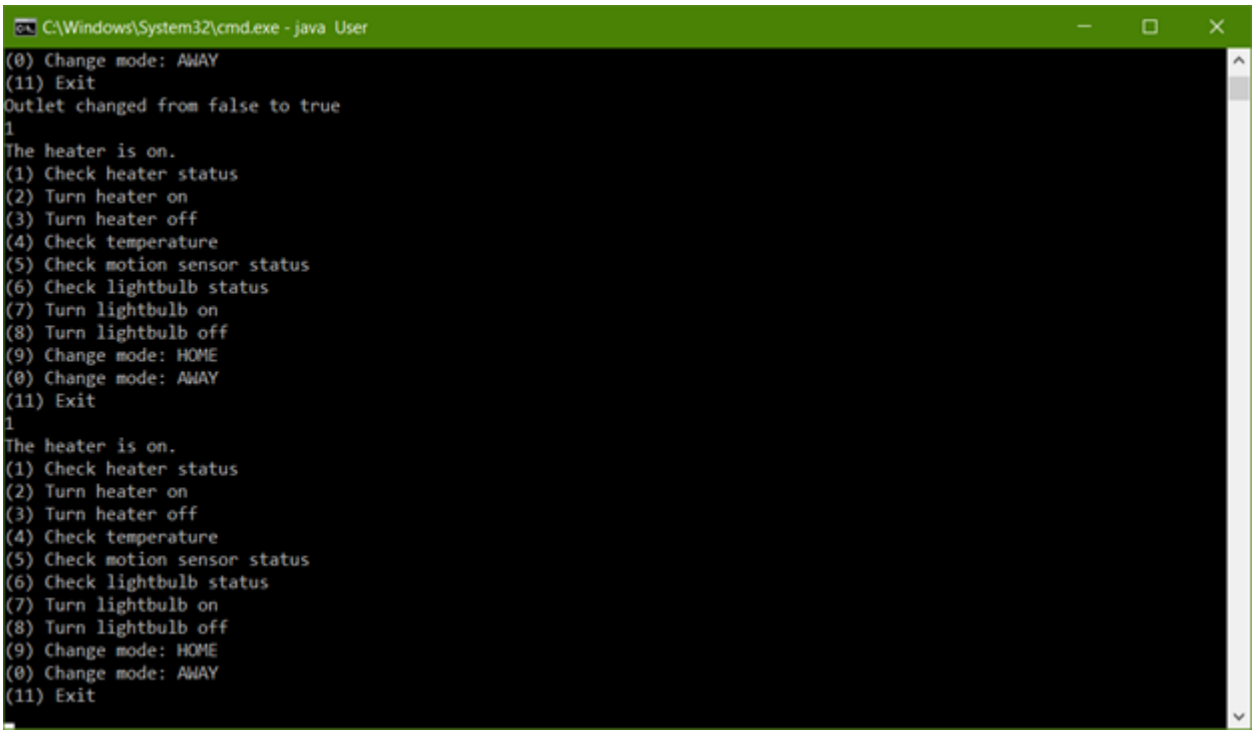
Test Case 2:

Input: User chooses option 1, “Check heater status”.

Pre-requisites: The server is running, User.java is connected to it, and the temperature is between 1 degree Celsius and 2 degrees Celsius.

Expected result: User receives a text message saying, “The heater is on”.

Actual result: User receives a text message saying, “The heater is on”.



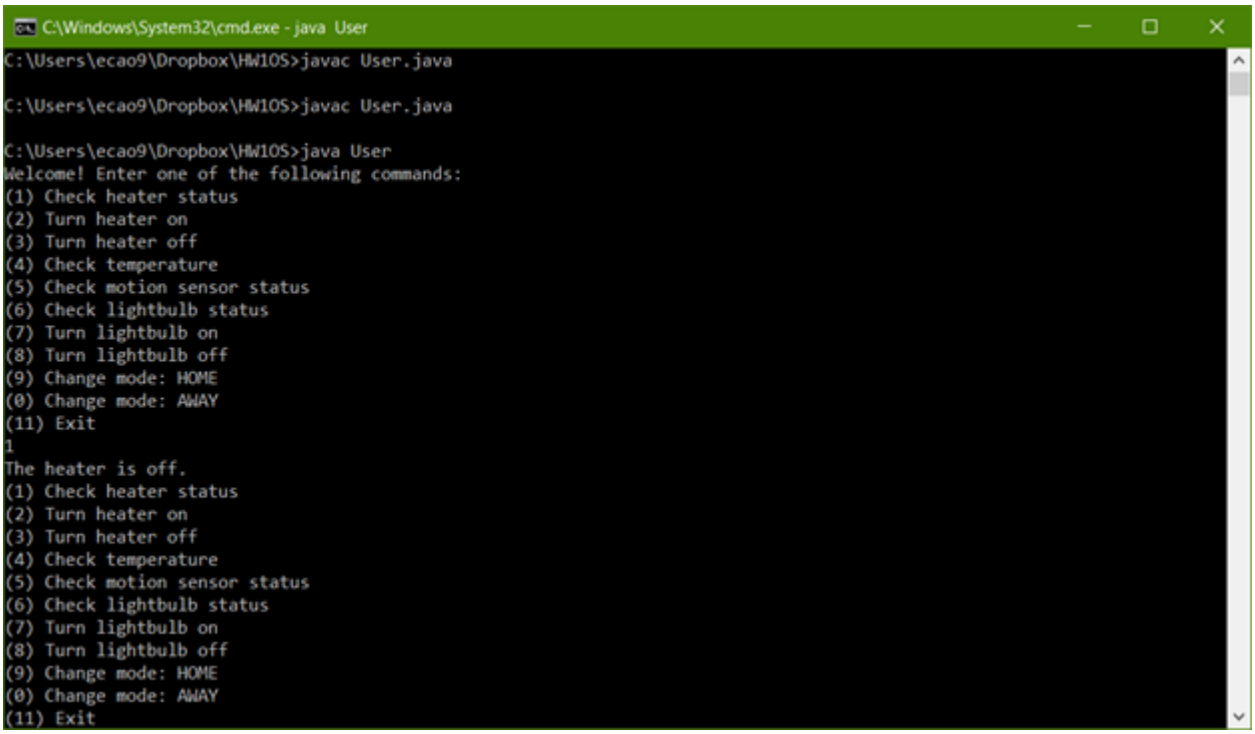
Test Case 3:

Input: User chooses option 1, “Check heater status”.

Pre-requisites: The server is running, User.java is connected to it, and the temperature is greater than 2 degrees Celsius.

Expected result: User receives a text message saying, “The heater is off”.

Actual result: User receives a text message saying, “The heater is off”.



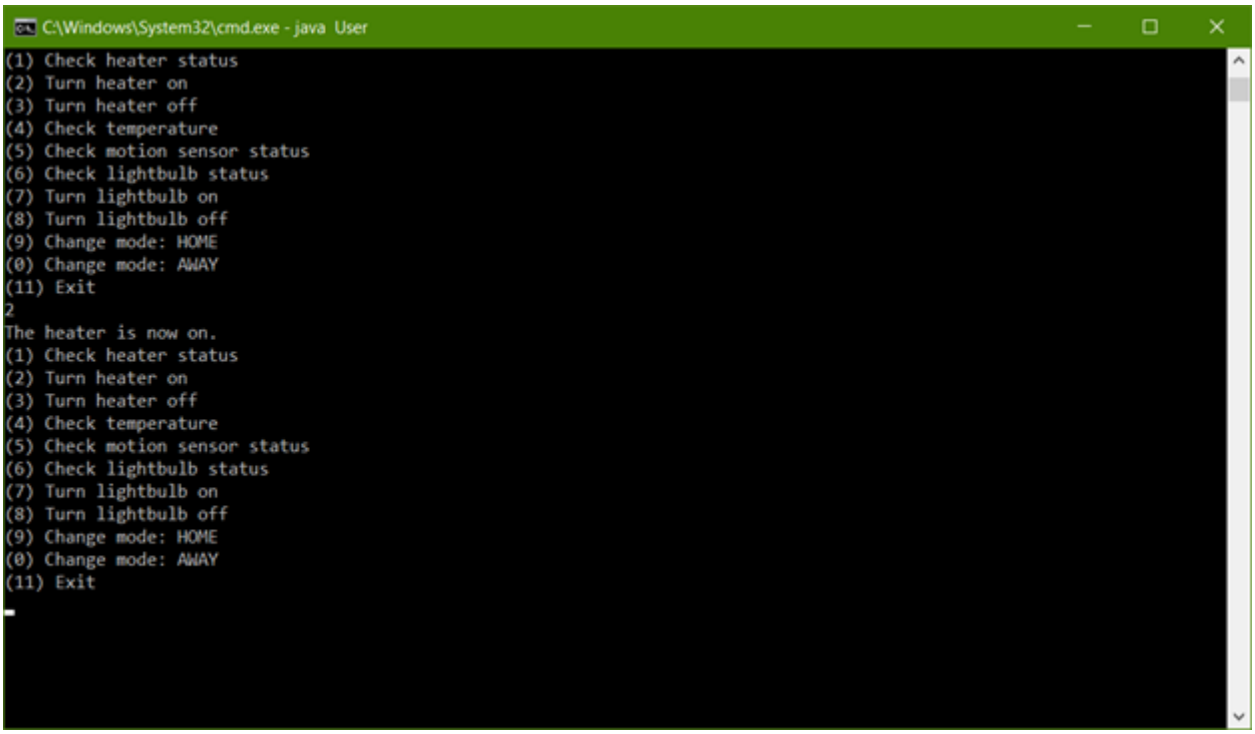
Test Case 4:

Input: User chooses option 2, “Turn heater on”.

Pre-requisites: The server is running, User.java is connected to it, and the heater is off.

Expected result: The heater is turned on and User receives a text message saying, “the heater is now on”.

Actual result: The heater is turned on and User receives a text message saying, “the heater is now on”.



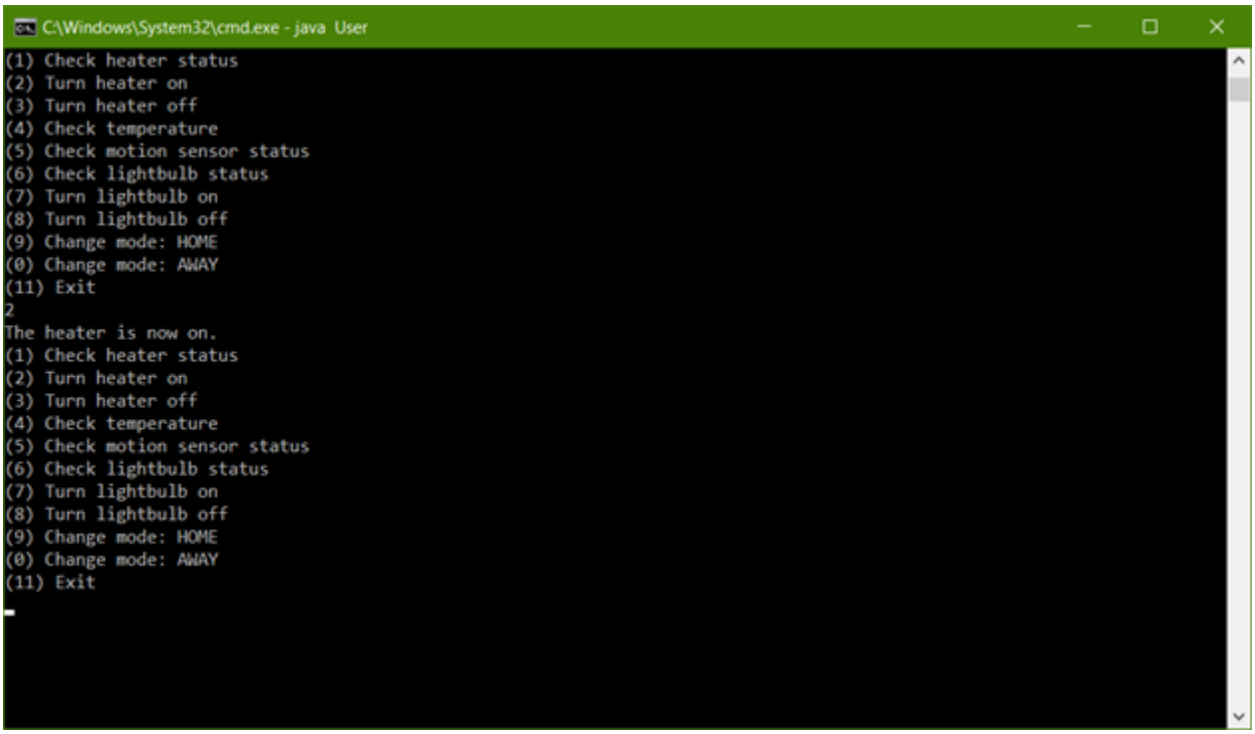
Test Case 5:

Input: User chooses option 2, “Turn heater on”.

Pre-requisites: The server is running, User.java is connected to it, and the heater is on.

Expected result: The heater is turned on and User receives a text message saying, “the heater is now on”.

Actual result: The heater is turned on and User receives a text message saying, “the heater is now on”.



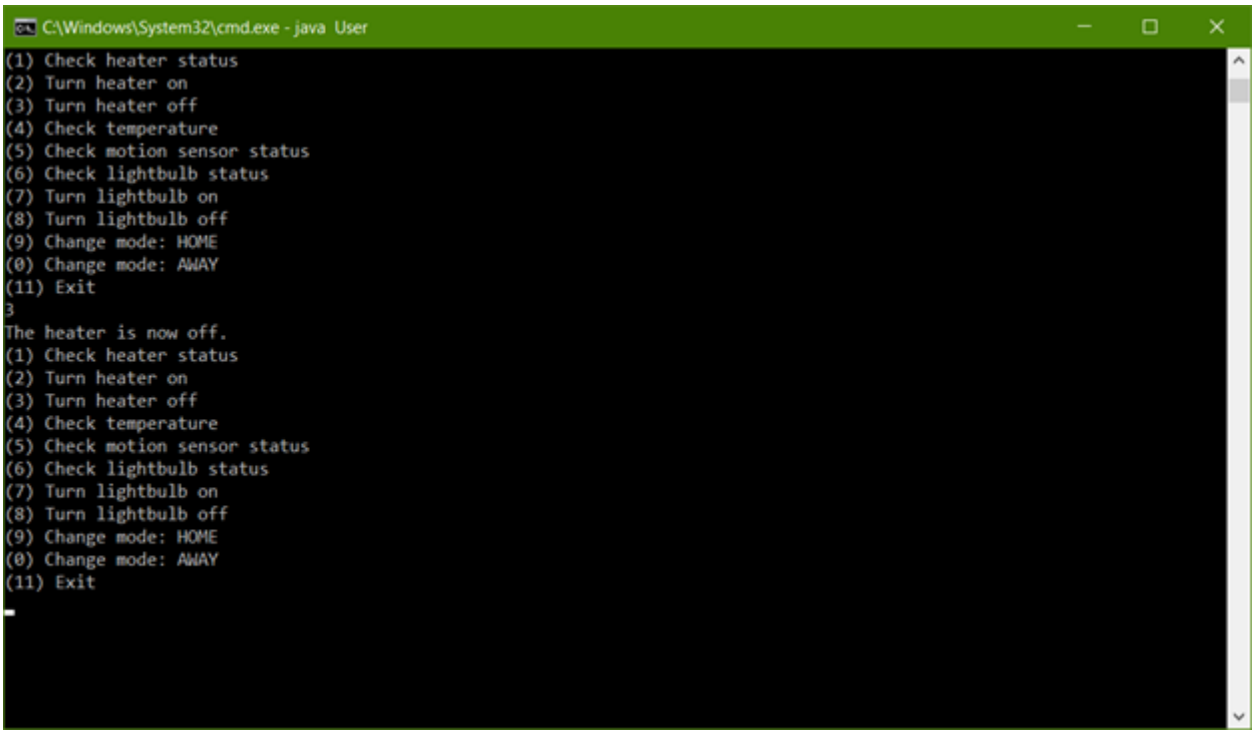
Test Case 6:

Input: User chooses option 3, “Turn heater off”.

Pre-requisites: The server is running, User.java is connected to it, and the heater is on.

Expected result: The heater is turned off and User receives a text message saying, “The heater is now off”.

Actual result: The heater is turned off and User receives a text message saying, “The heater is now off”.



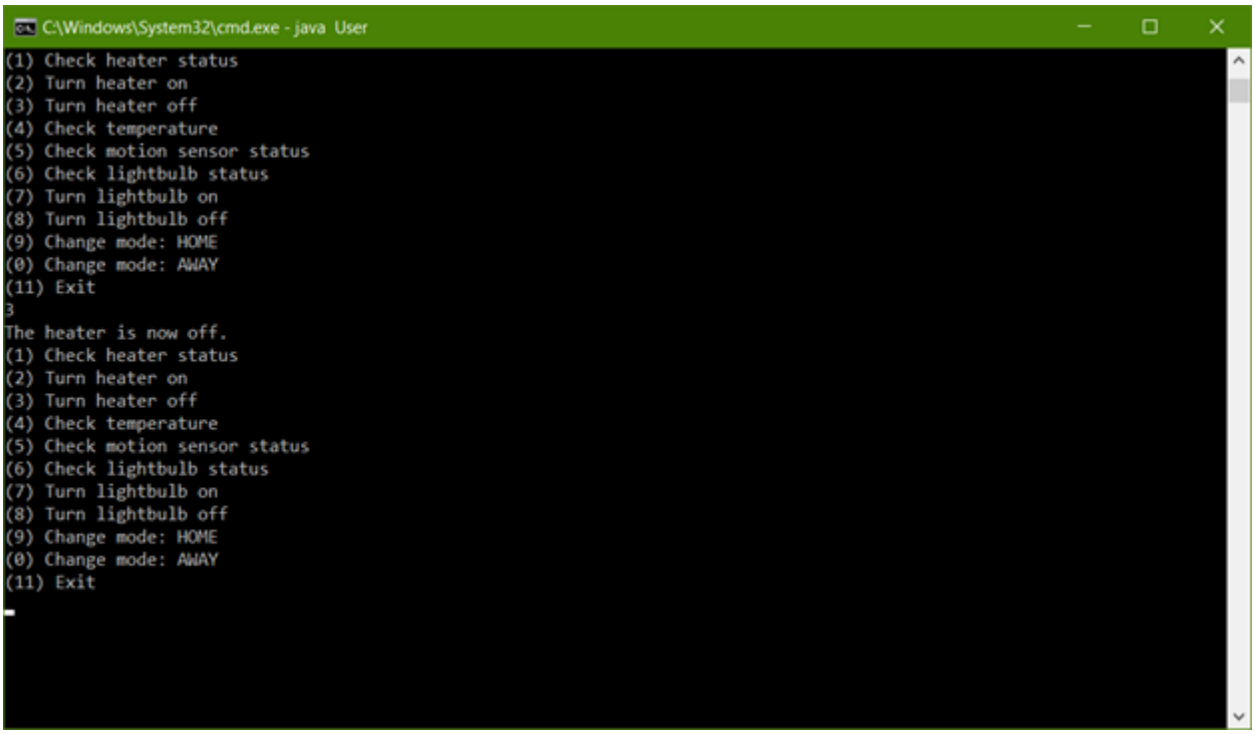
Test Case 7:

Input: User chooses option 3, “Turn heater off”.

Pre-requisites: The server is running, User.java is connected to it, and the heater is off.

Expected result: The heater is turned off and User receives a text message saying, “The heater is now off”.

Actual result: The heater is turned off and User receives a text message saying, “The heater is now off”.



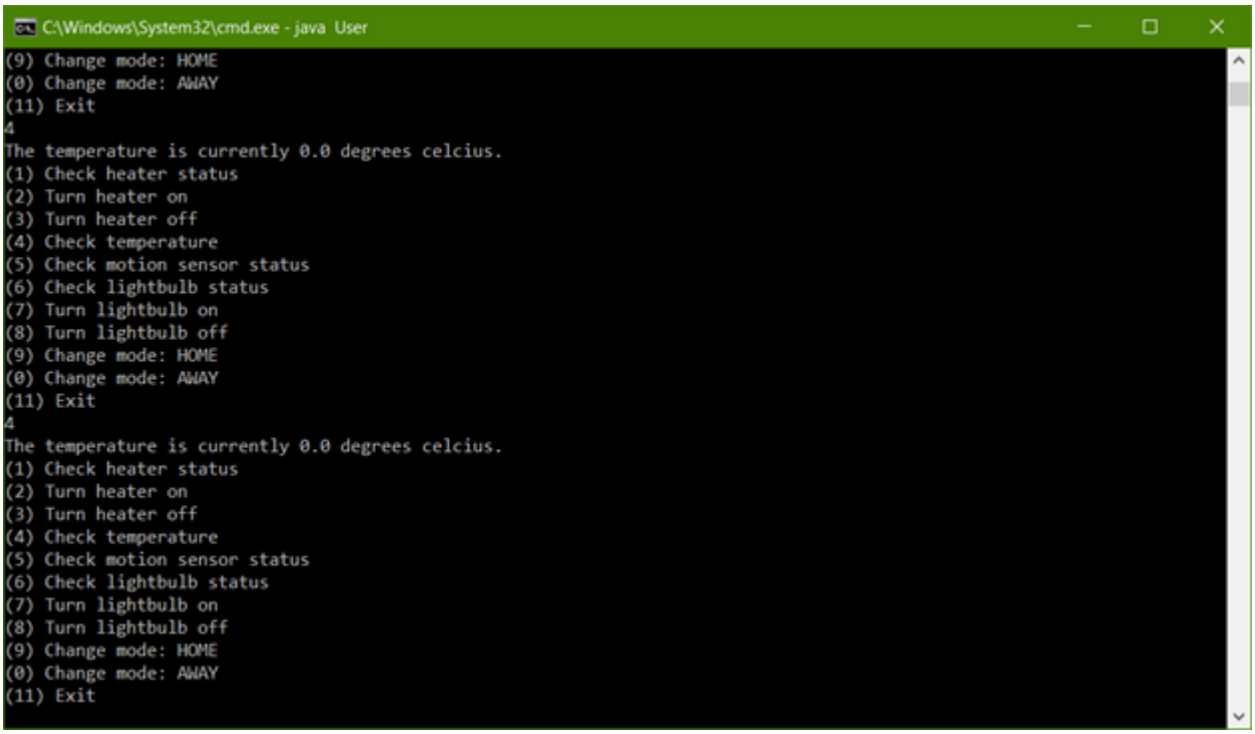
Test Case 8:

Input: User chooses option 4, “Check temperature”.

Pre-requisites: The server is running, User.java is connected to it, and it is 0 degrees Celsius.

Expected result: User receives a text message saying, “The temperature is currently 0.0 degrees Celsius”.

Actual result: User receives a text message saying, “The temperature is currently 0.0 degrees Celsius”.



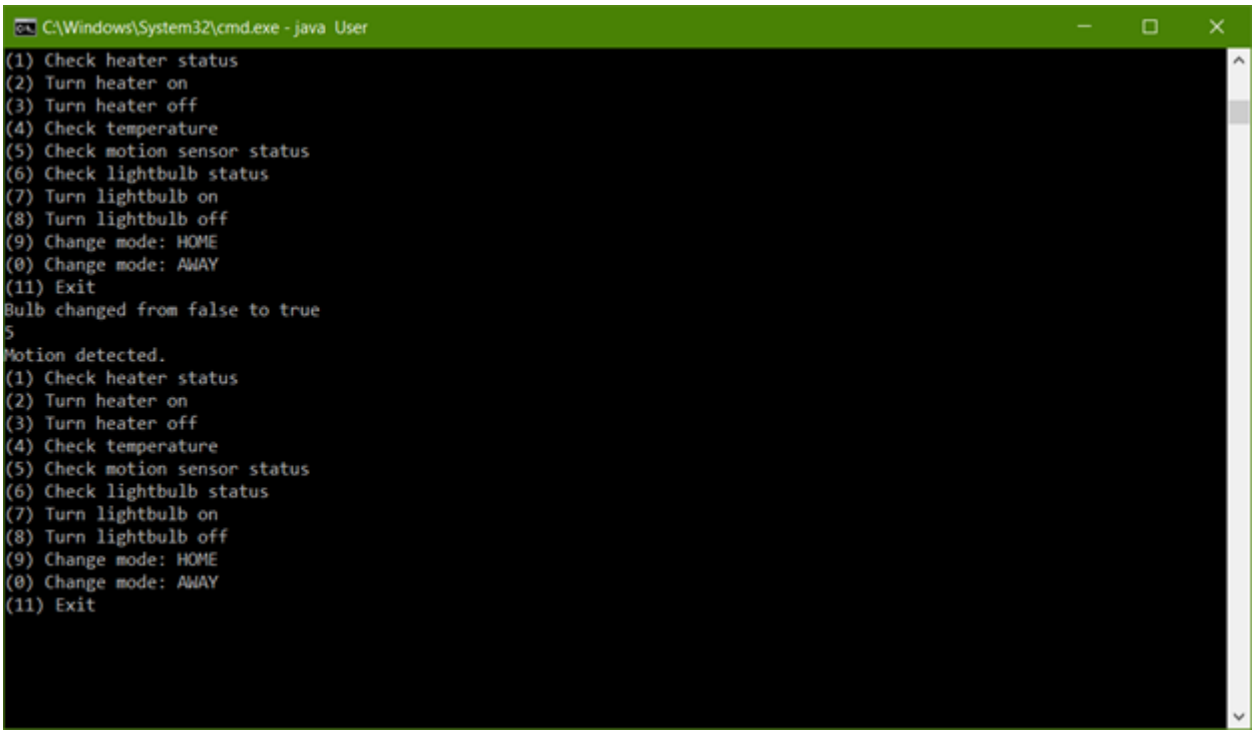
Test Case 9:

Input: User chooses option 5, “Check motion sensor status”.

Pre-requisites: The server is running, User.java is connected to it, and there is motion.

Expected result: User receives a text message saying, “Motion detected”.

Actual result: User receives a text message saying, “Motion detected”.



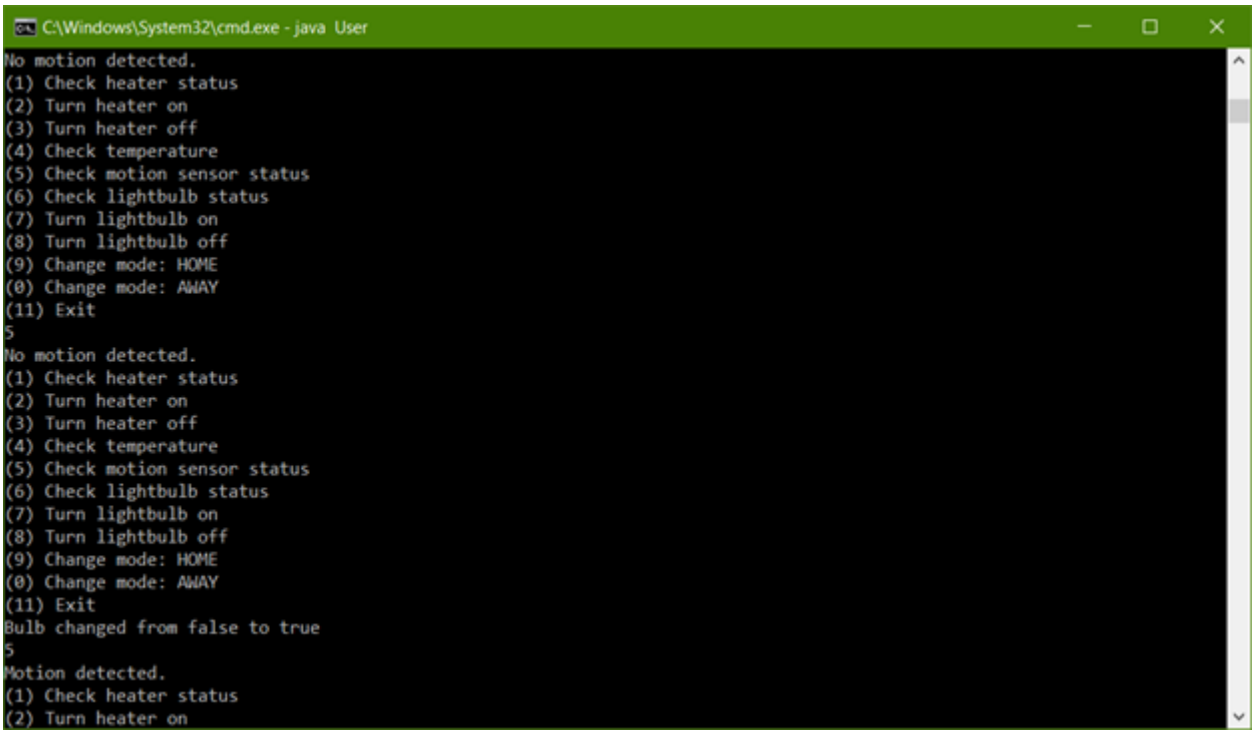
Test Case 10:

Input: User chooses option 5, “Check motion sensor status”.

Pre-requisites: The server is running, User.java is connected to it, and there is no motion.

Expected result: User receives a text message saying, “No motion detected”.

Actual result: User receives a text message saying, “No motion detected”.



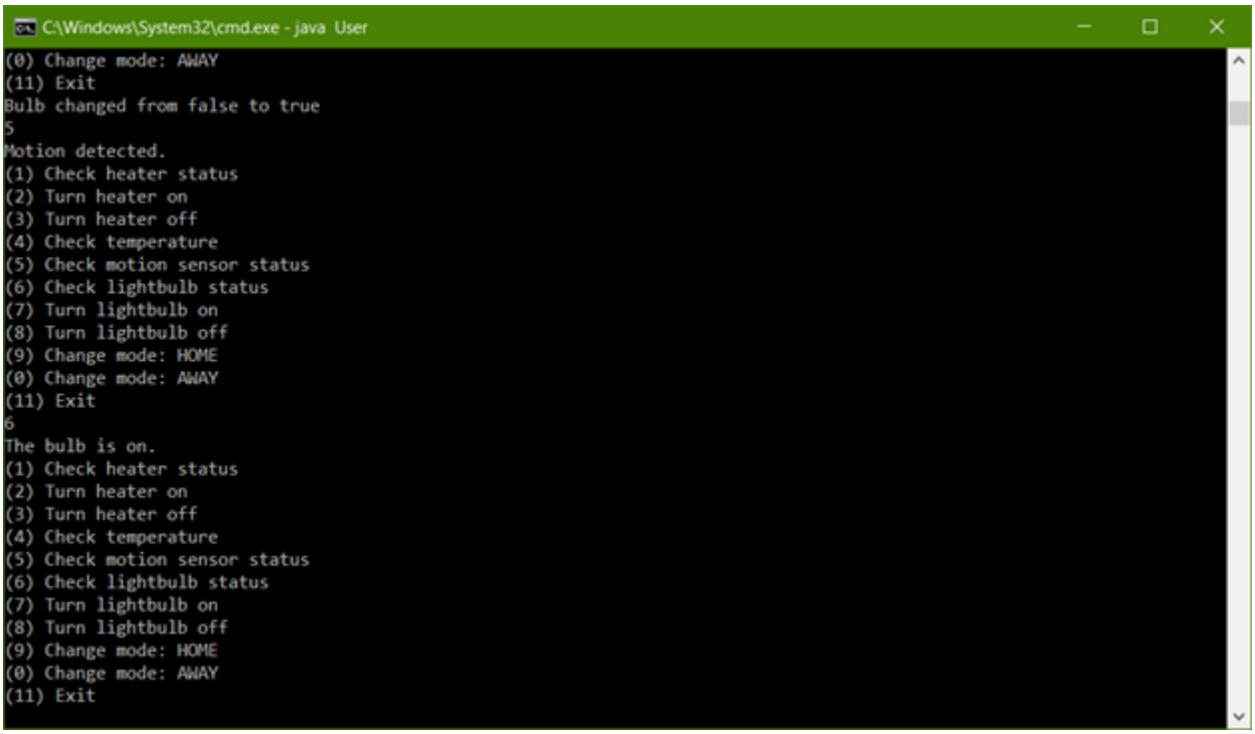
Test Case 11:

Input: User chooses option 6, “Check lightbulb status”.

Pre-requisites: The server is running, User.java is connected to it, and there is motion.

Expected result: User receives a text message saying, “The bulb is on”.

Actual result: User receives a text message saying, “The bulb is on”.



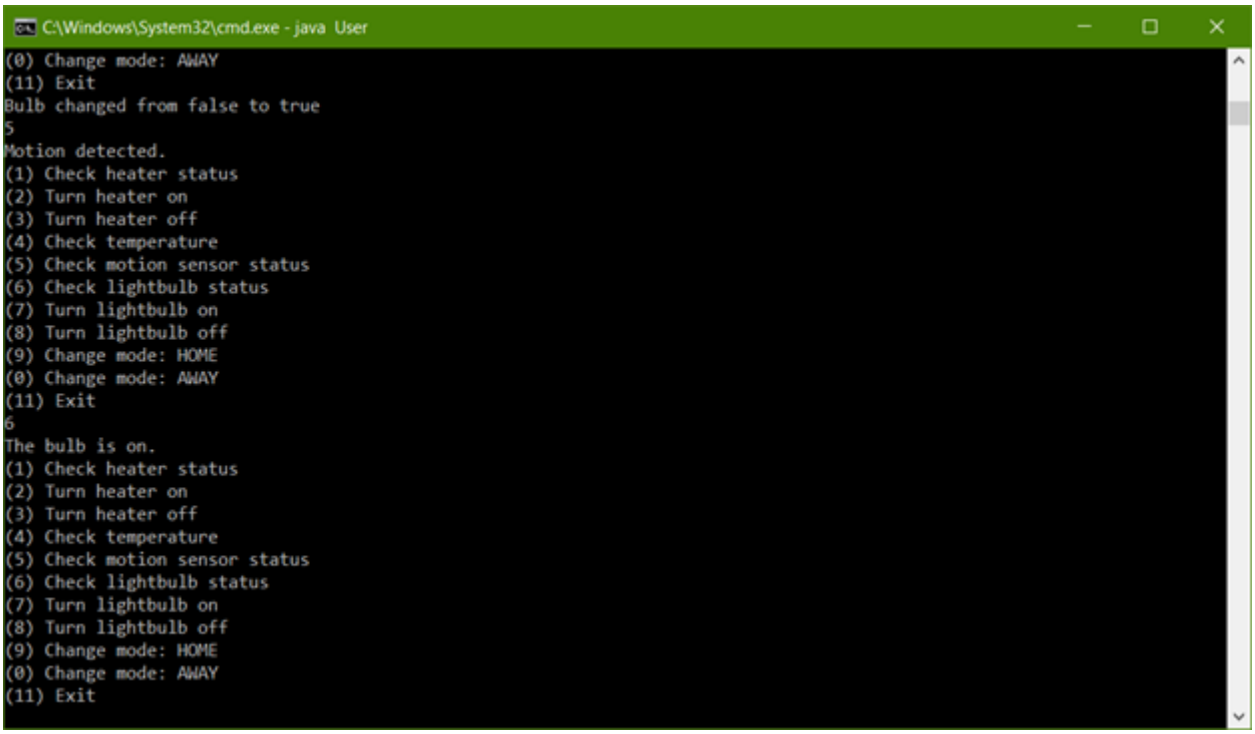
Test Case 12:

Input: User chooses option 6, “Check lightbulb status”.

Pre-requisites: The server is running, User.java is connected to it, and there has been no motion for three minutes.

Expected result: User receives a text message saying, “Bulb is on”.

Actual result: User receives a text message saying, “Bulb is on”.



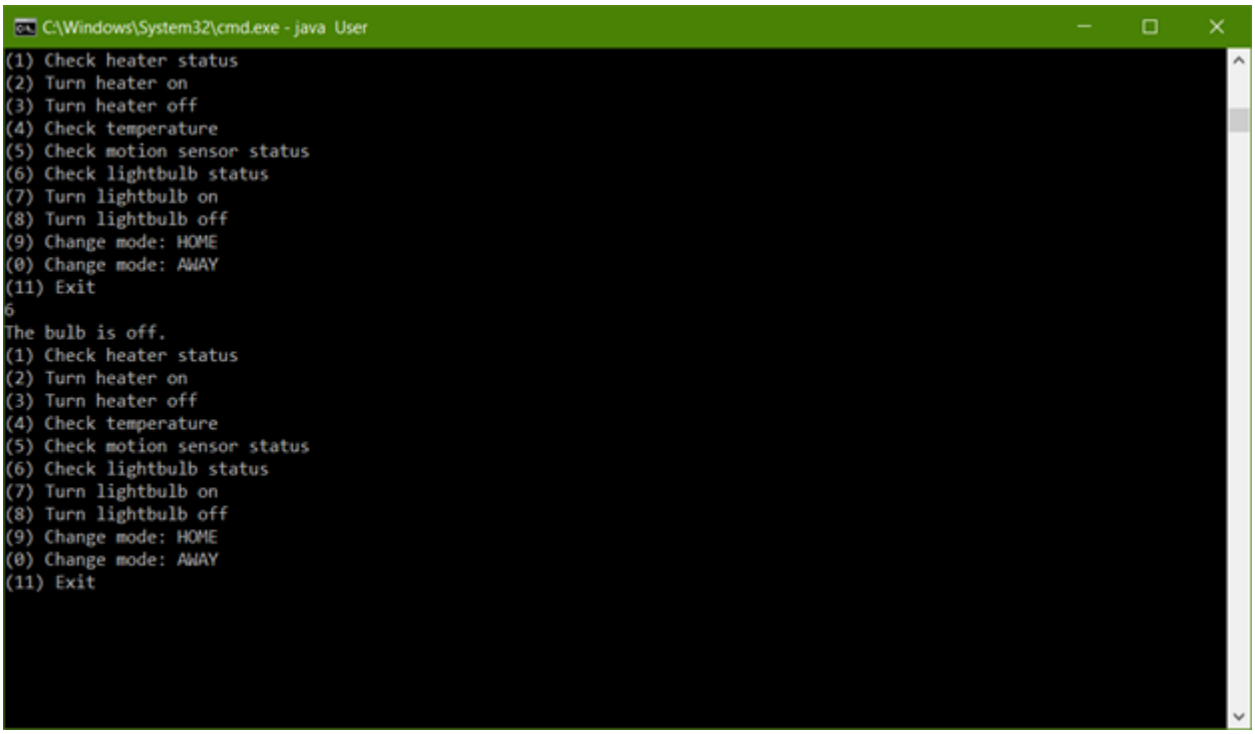
Test Case 13:

Input: User chooses option 6, “Check lightbulb status”.

Pre-requisites: The server is running, User.java is connected to it, and there has been no motion for six minutes.

Expected result: User receives a text message saying, “Bulb is off”.

Actual result: User receives a text message saying, “Bulb is off”.



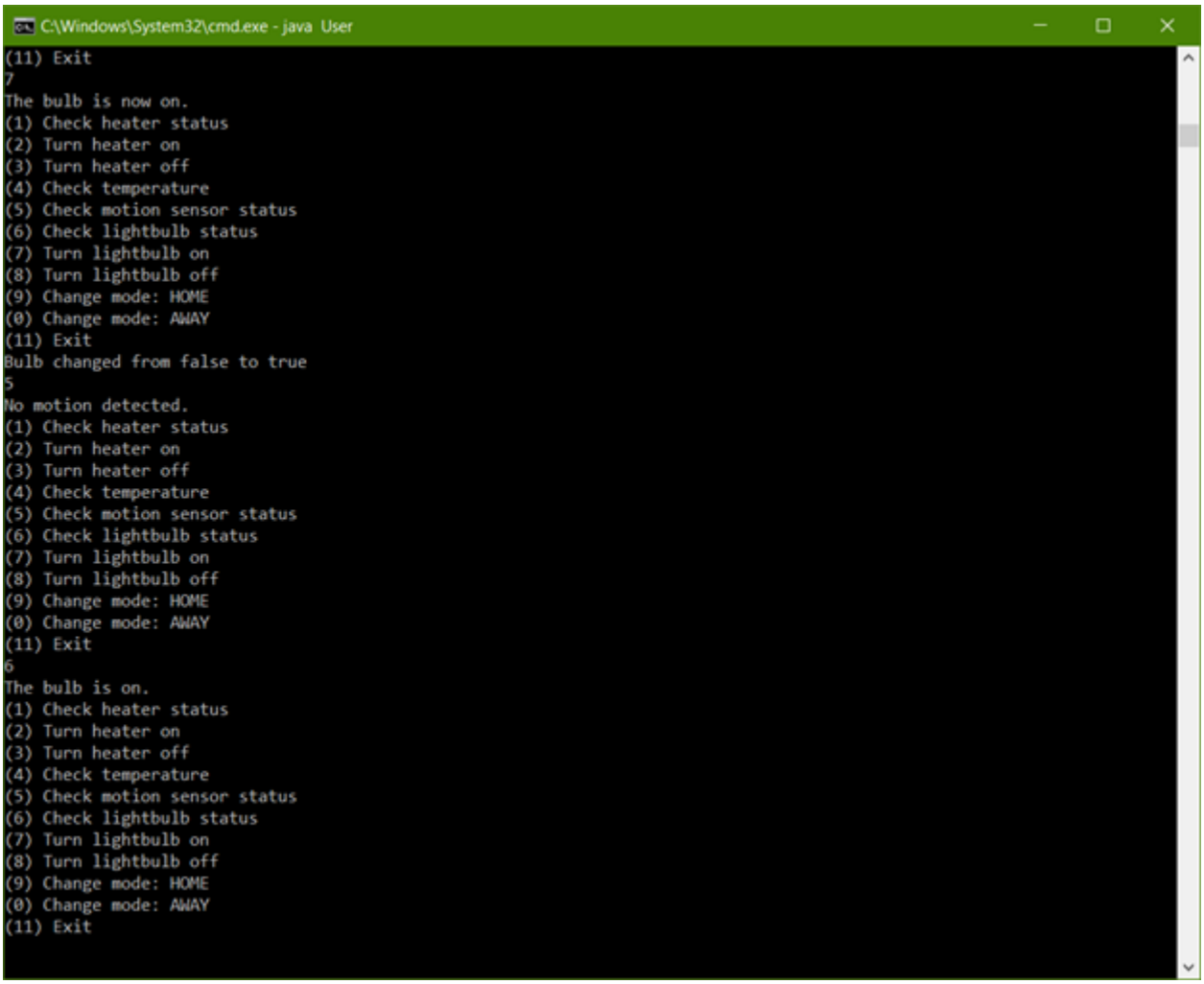
Test Case 14:

Input: User chooses option 7, “Turn lightbulb on”.

Pre-requisites: The server is running, User.java is connected to it, and there has been no motion for five minutes.

Expected result: User receives a text message saying, “The bulb is now on”.

Actual result: User receives a text message saying, “The bulb is now on”.



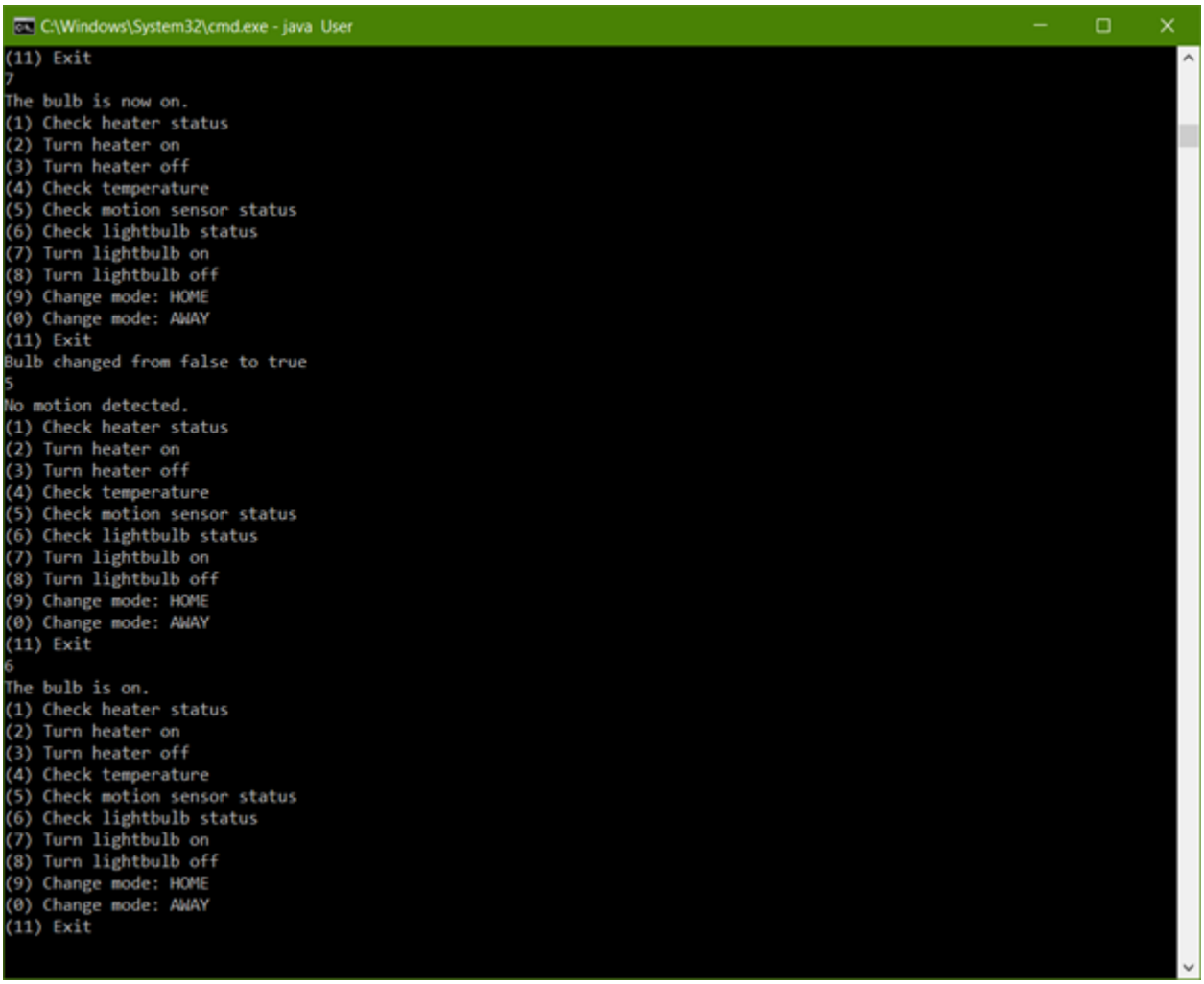
Test Case 15:

Input: User chooses option 7, “Turn lightbulb on”.

Pre-requisites: The server is running, User.java is connected to it, and there has been no motion for three minutes.

Expected result: User receives a text message saying, “The bulb is now on”.

Actual result: User receives a text message saying, “The bulb is now on”.



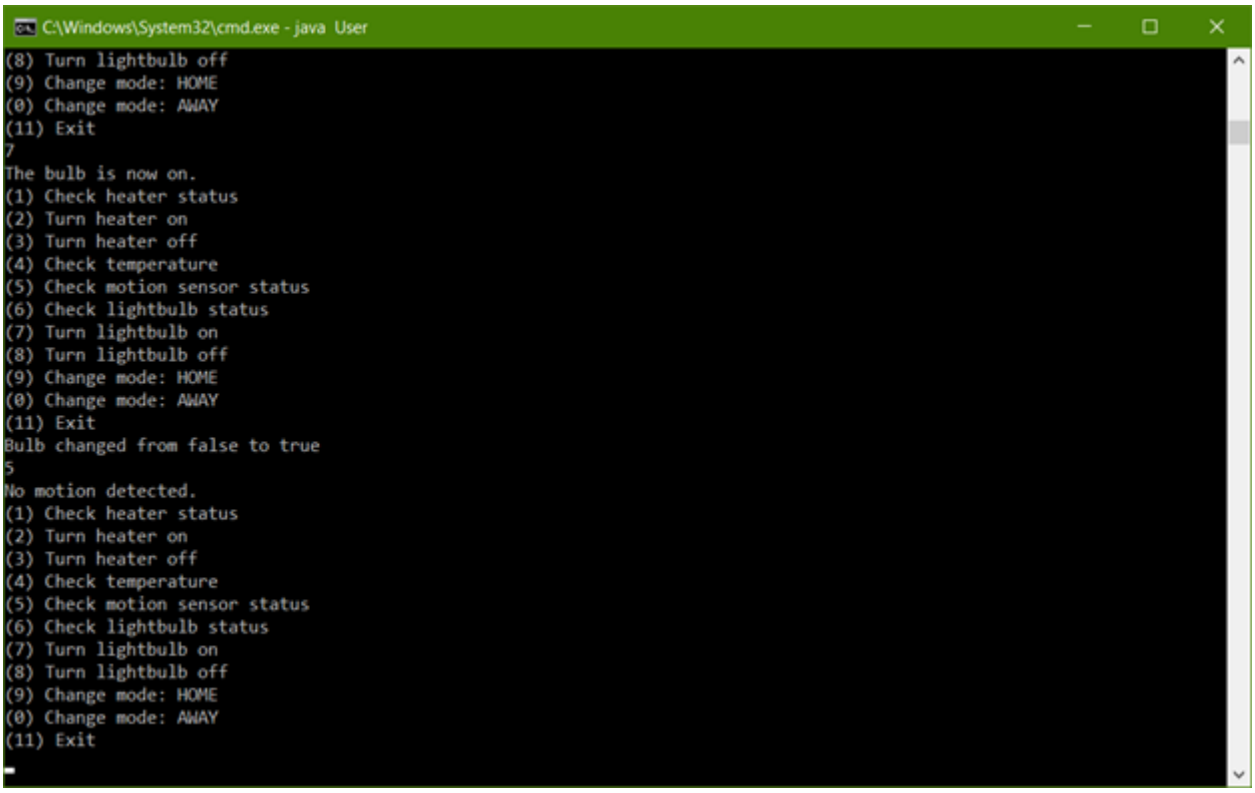
Test Case 16:

Input: User chooses option 7, “Turn lightbulb on”.

Pre-requisites: The server is running, User.java is connected to it, and the lightbulb is already on.

Expected result: User receives a text message saying, “The bulb is now on”.

Actual result: User receives a text message saying, “The bulb is now on”.



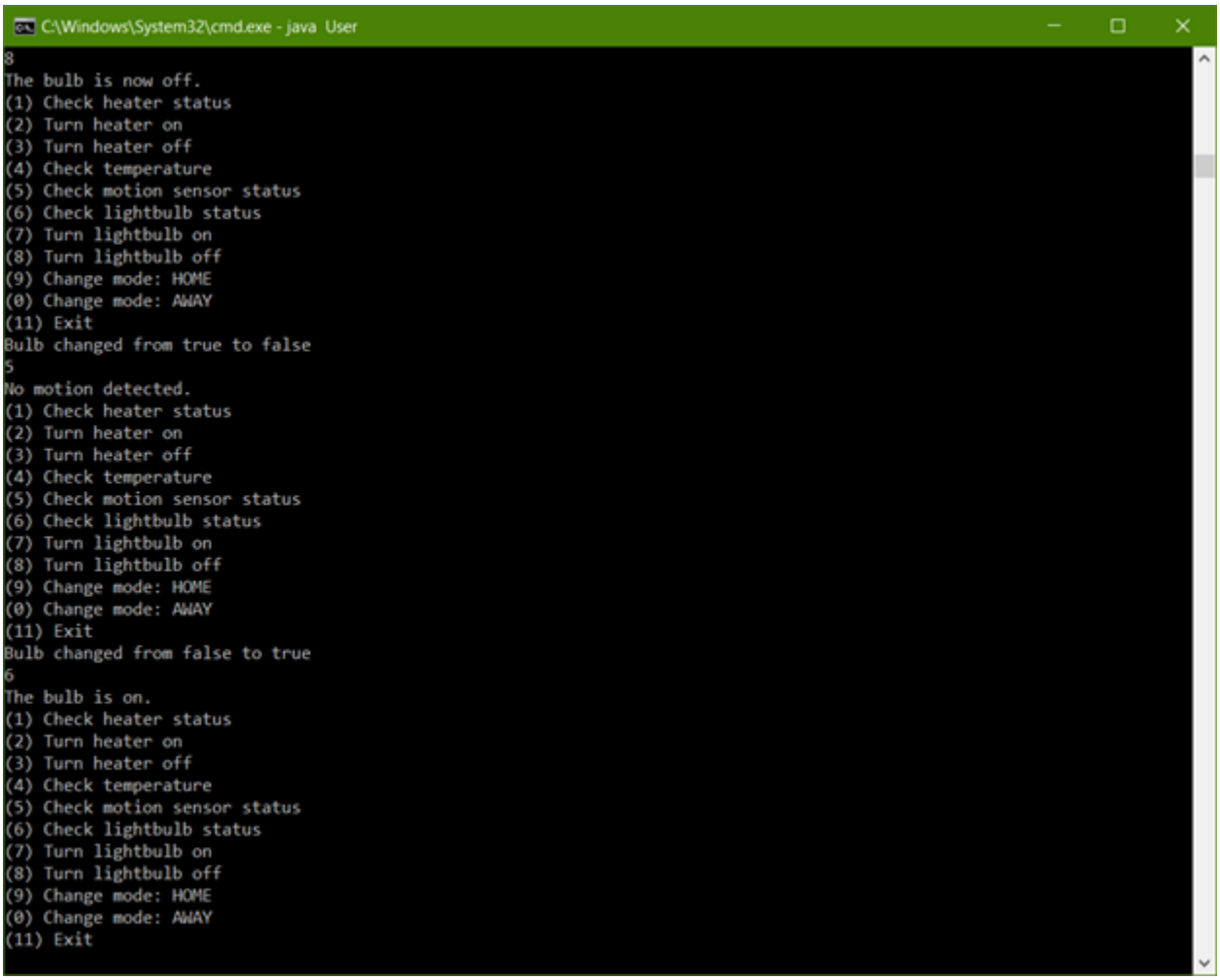
Test Case 17:

Input: User chooses option 8, “Turn lightbulb off”.

Pre-requisites: The server is running, User.java is connected to it, and there has been no motion for three minutes.

Expected result: User receives a text message saying, “The bulb is now on”.

Actual result: User receives a text message saying, “The bulb is now on”.



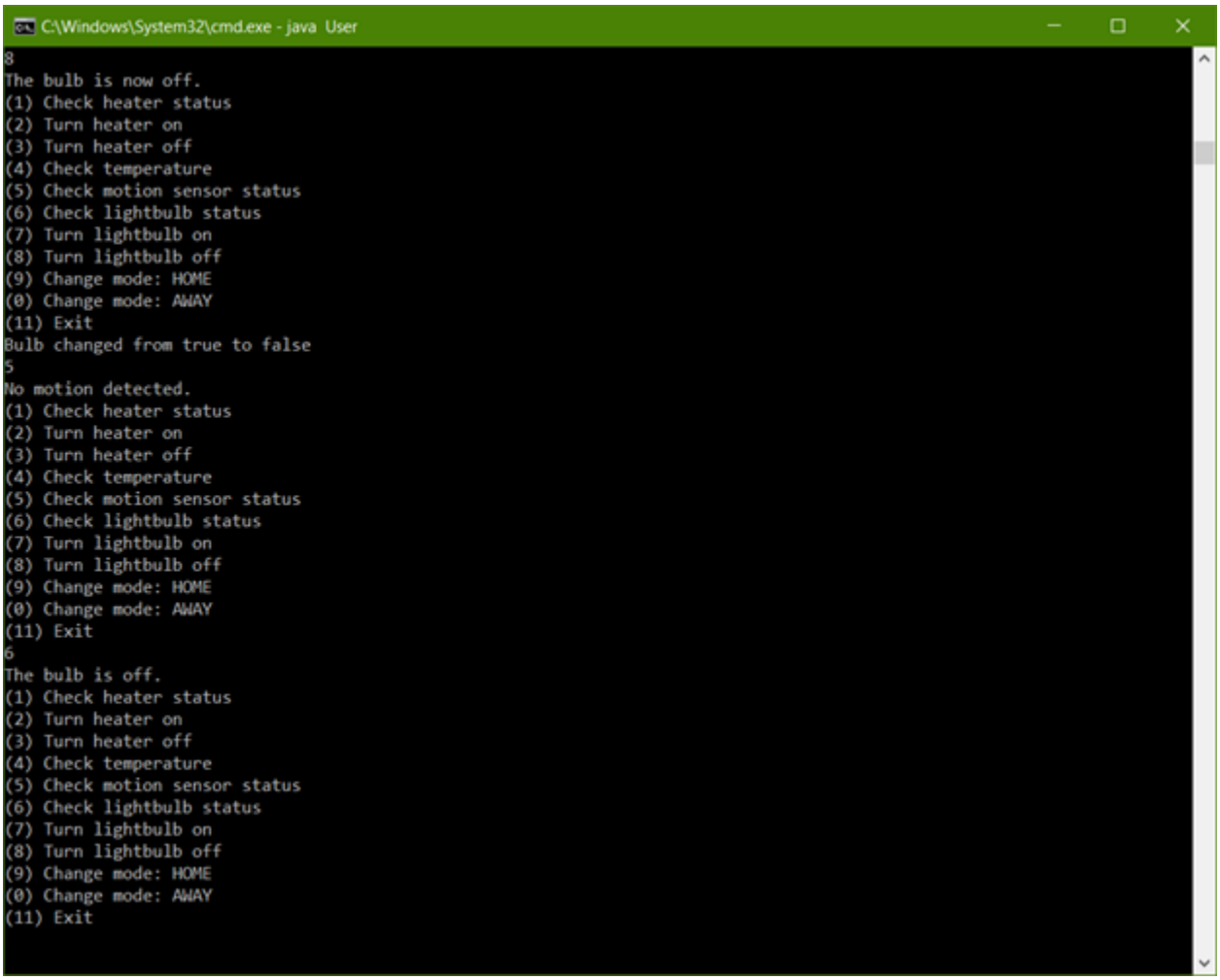
Test Case 18:

Input: User chooses option 8, “Turn lightbulb off”.

Pre-requisites: The server is running, User.java is connected to it, and there has been no motion for five minutes.

Expected result: User receives a text message saying, “The bulb is now off”.

Actual result: User receives a text message saying, “The bulb is now off”.



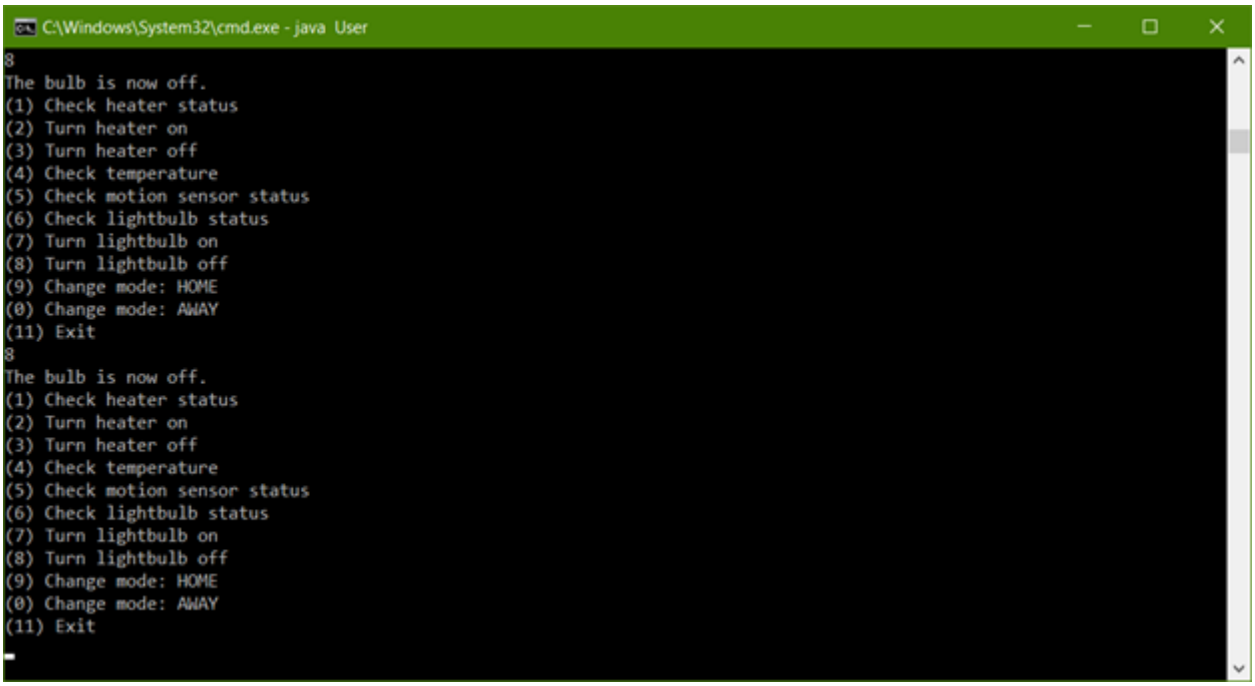
Test Case 19:

Input: User chooses option 8, “Turn lightbulb off”.

Pre-requisites: The server is running, User.java is connected to it, and the lightbulb is already off.

Expected result: User receives a text message saying, “The bulb is now off”.

Actual result: User receives a text message saying, “The bulb is now off”.



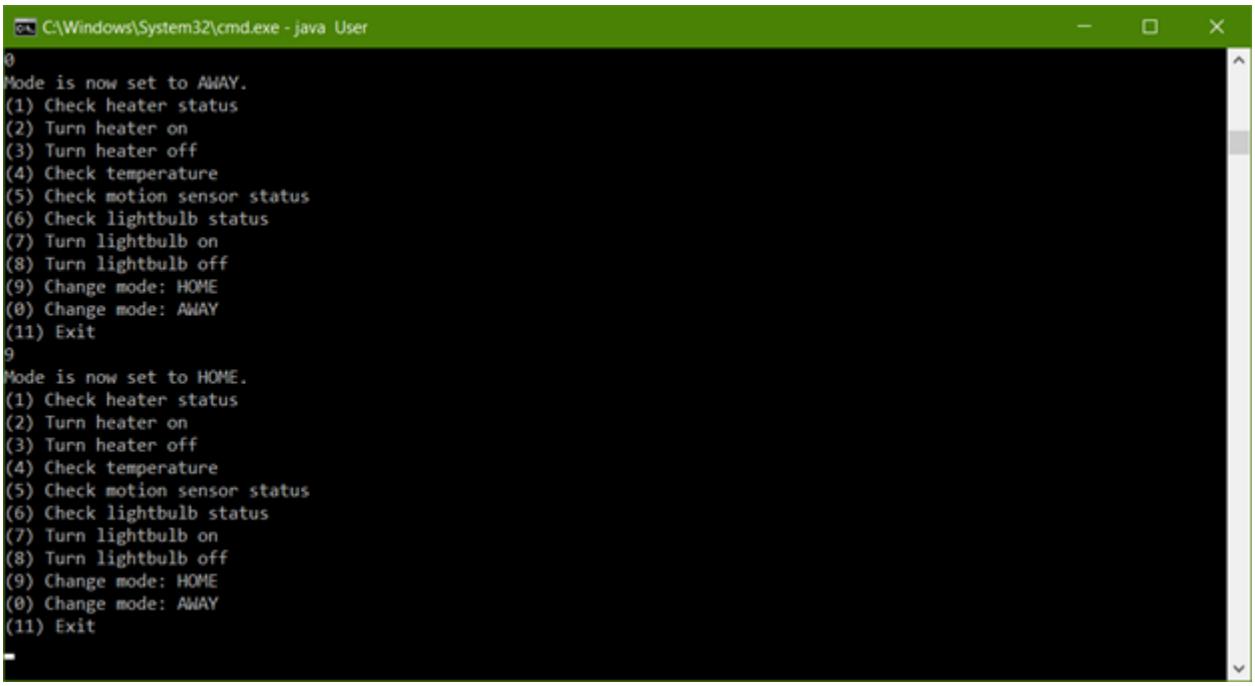
Test Case 20:

Input: User chooses option 9, “Change mode: HOME”.

Pre-requisites: The server is running, User.java is connected to it, and mode is currently set to AWAY.

Expected result: User receives a text message saying, “Mode is now set to HOME”.

Actual result: User receives a text message saying, “Mode is now set to HOME”.



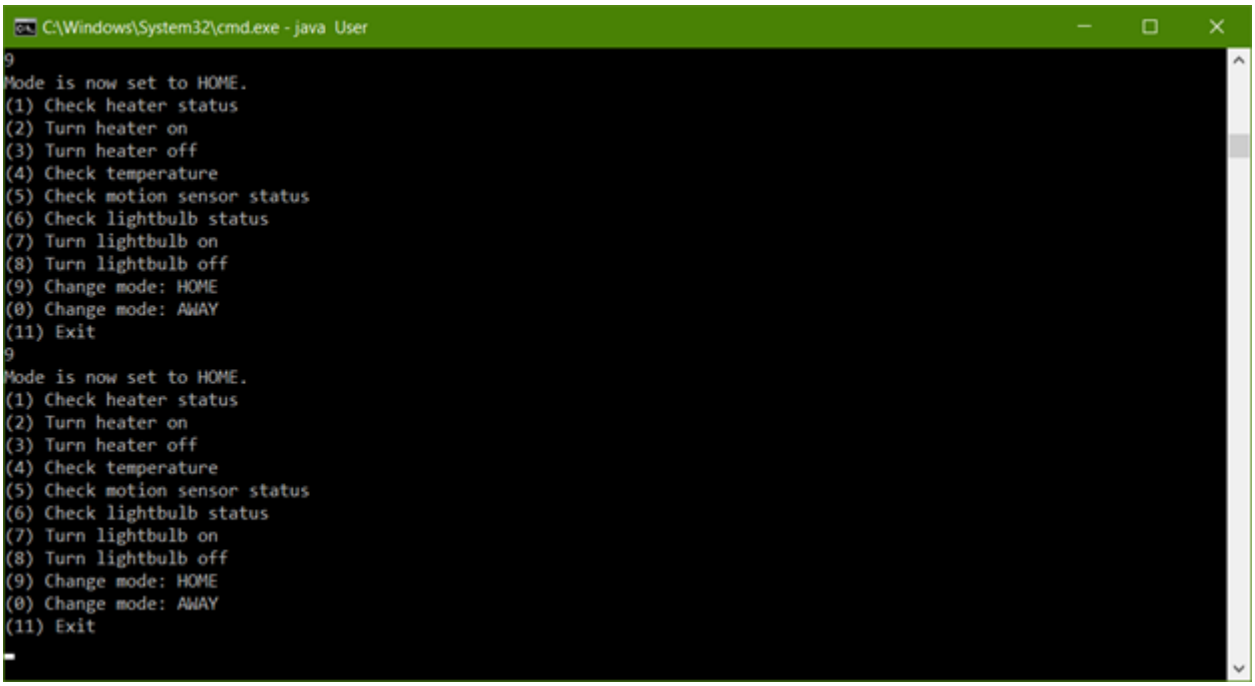
Test Case 21:

Input: User chooses option 9, “Change mode: HOME”.

Pre-requisites: The server is running, User.java is connected to it, and mode is currently set to HOME.

Expected result: User receives a text message saying, “Mode is now set to HOME”.

Actual result: User receives a text message saying, “Mode is now set to HOME”.



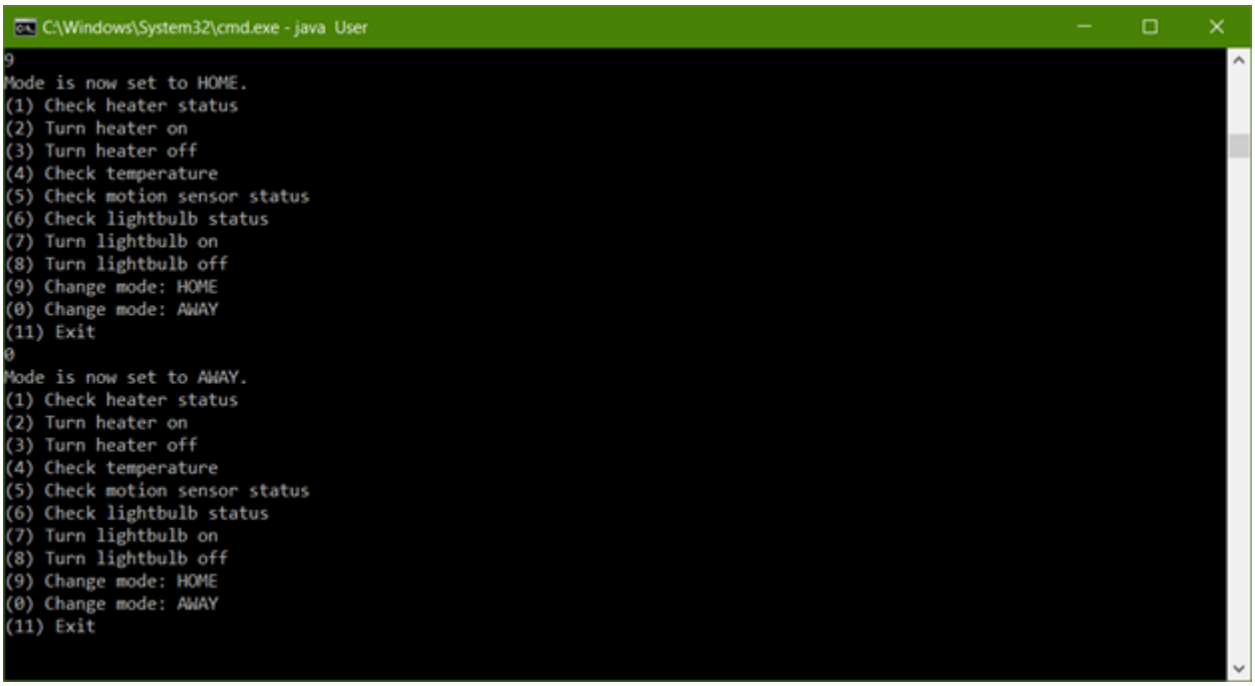
Test Case 22:

Input: User chooses option 9, “Change mode: AWAY”.

Pre-requisites: The server is running, User.java is connected to it, and mode is currently set to HOME.

Expected result: User receives a text message saying, “Mode is now set to AWAY”.

Actual result: User receives a text message saying, “Mode is now set to AWAY”.



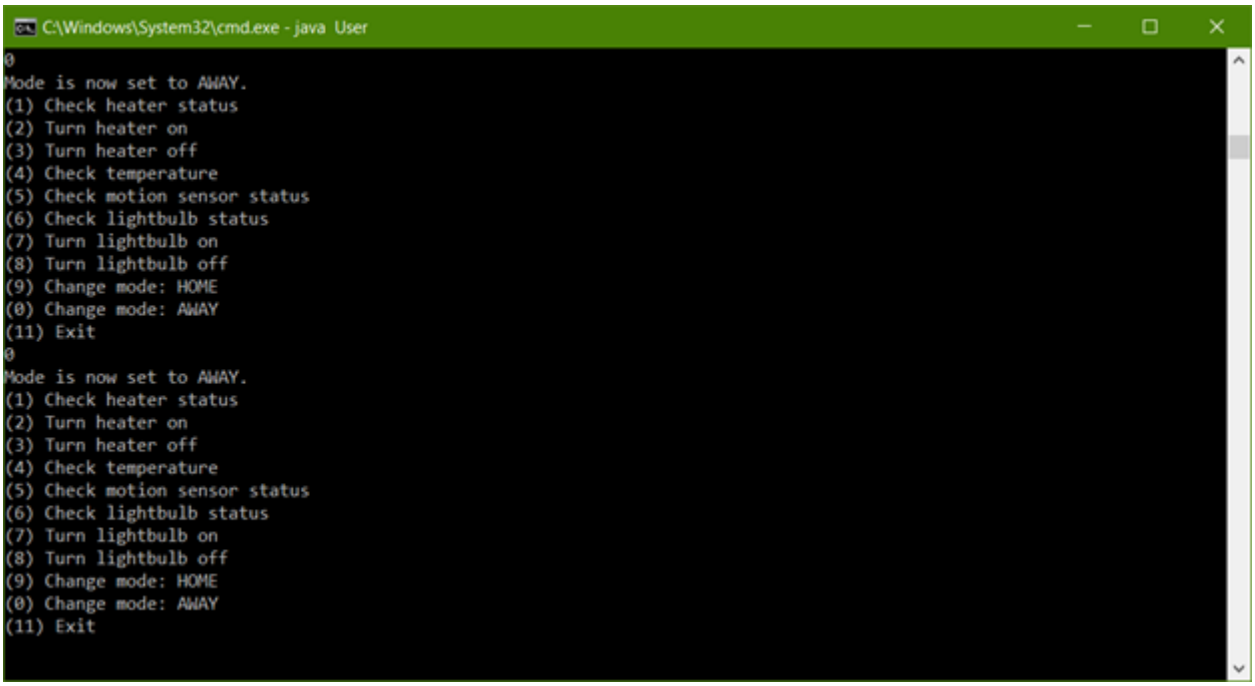
Test Case 23:

Input: User chooses option 0, “Change mode: AWAY”.

Pre-requisites: The server is running, User.java is connected to it, and mode is currently set to AWAY.

Expected result: User receives a text message saying, “Mode is now set to AWAY”.

Actual result: User receives a text message saying, “Mode is now set to AWAY”.



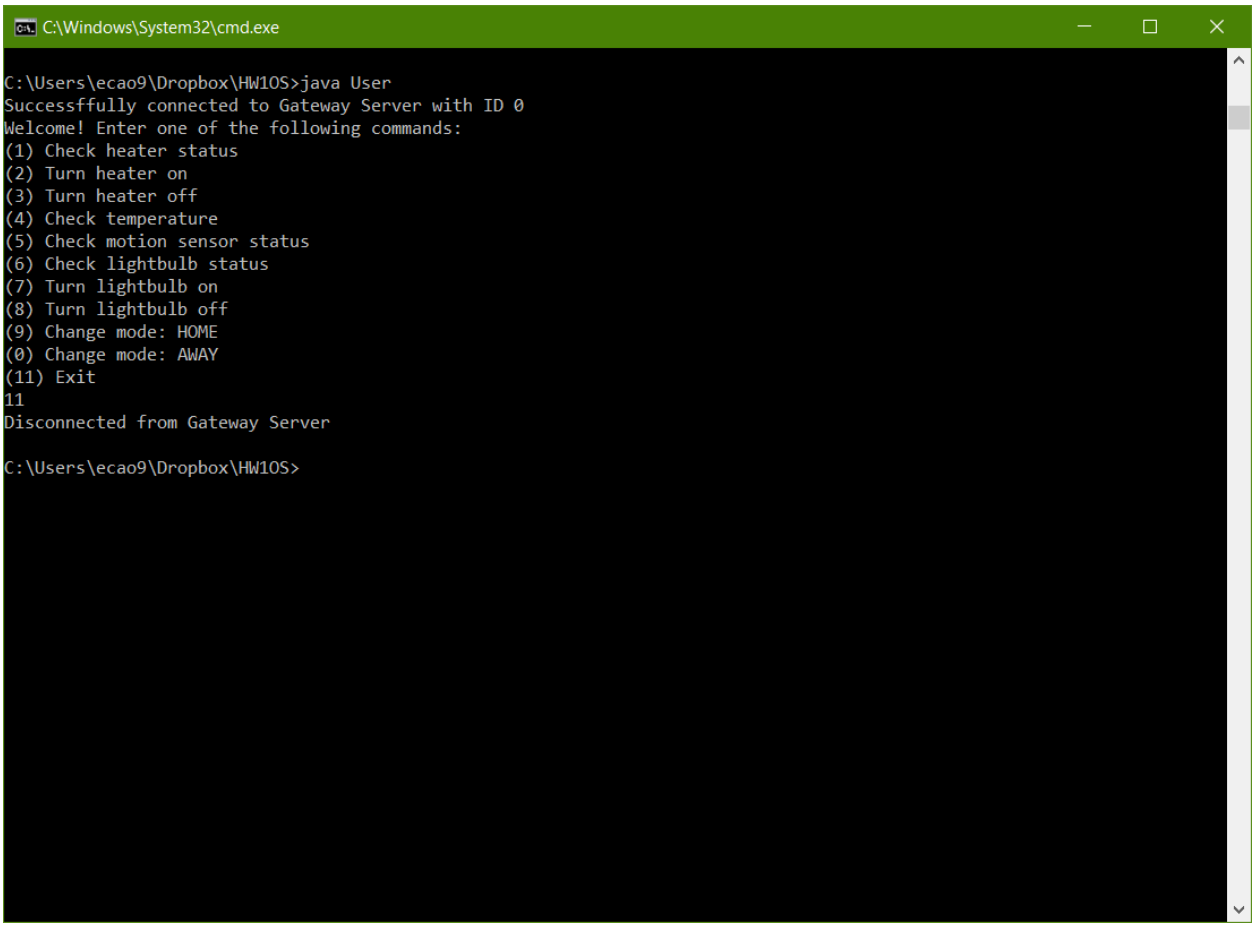
Test Case 24:

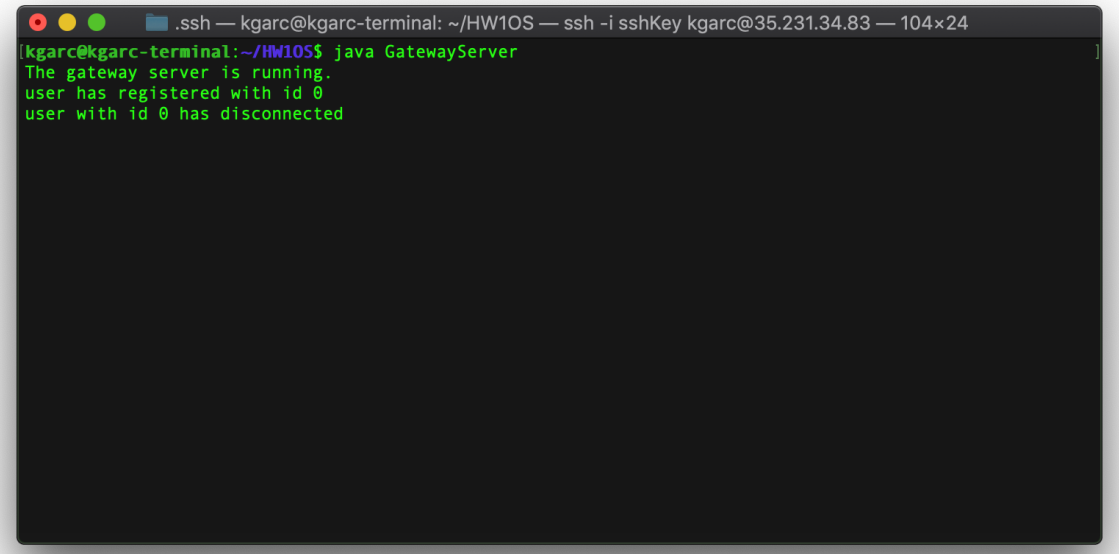
Input: User chooses option 11, “Exit”.

Pre-requisites: The server is running and User.java is connected to it.

Expected result: User.java successfully disconnects with message “Disconnected from Gateway Server”, and the server continues running and its prints the message “User with id x has disconnected” and stops the thread.

Actual result: User.java successfully disconnects with message “Disconnected from Gateway Server”, and the server continues running and its prints the message “User with id x has disconnected” and stops the thread.


C:\Windows\System32\cmd.exe
C:\Users\ecao9\Dropbox\HW1OS>java User
Successffully connected to Gateway Server with ID 0
Welcome! Enter one of the following commands:
(1) Check heater status
(2) Turn heater on
(3) Turn heater off
(4) Check temperature
(5) Check motion sensor status
(6) Check lightbulb status
(7) Turn lightbulb on
(8) Turn lightbulb off
(9) Change mode: HOME
(0) Change mode: AWAY
(11) Exit
11
Disconnected from Gateway Server
C:\Users\ecao9\Dropbox\HW1OS>


.ssh — kgarc@kgarc-terminal: ~/HW1OS — ssh -i sshKey kgarc@35.231.34.83 — 104×24
[kgarc@kgarc-terminal:~/HW1OS$ java GatewayServer
The gateway server is running.
user has registered with id 0
user with id 0 has disconnected

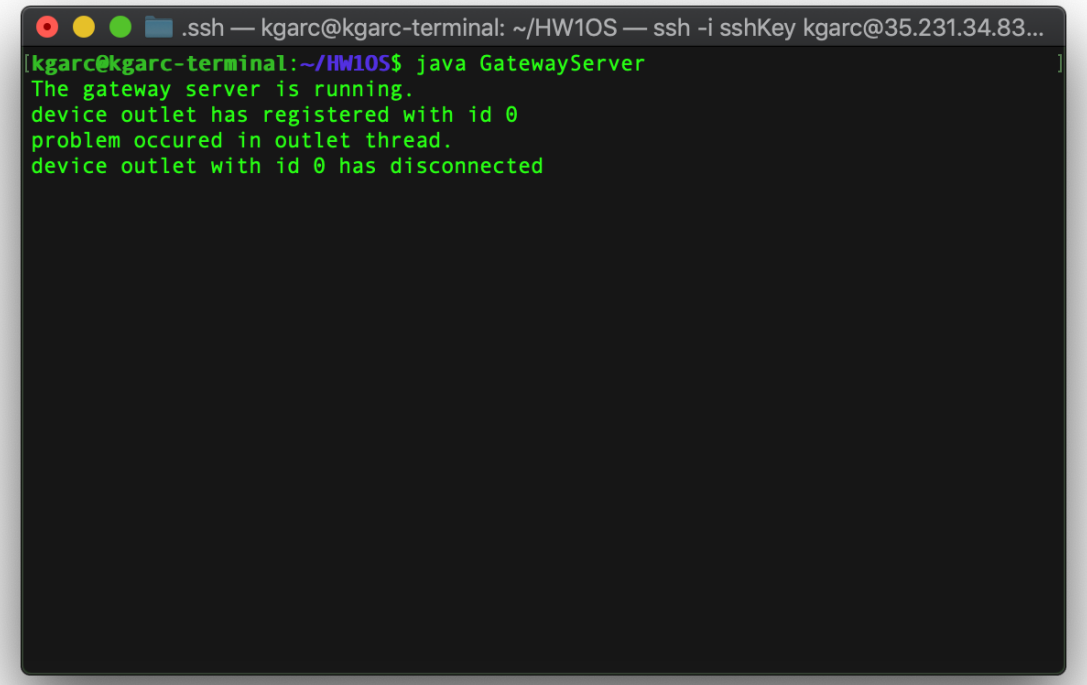
Test Case 25:

Input: Outlet stops running unexpectedly.

Pre-requisites: The server and the heater are running.

Expected result: Outlet successfully stops, the server keeps running with no error, and server prints out the message “Device outlet with id x has disconnected”, and that thread stops.

Actual result: Outlet successfully stops, the server keeps running with no error, and server prints out the message “Device outlet with id x has disconnected”, and that thread stops.



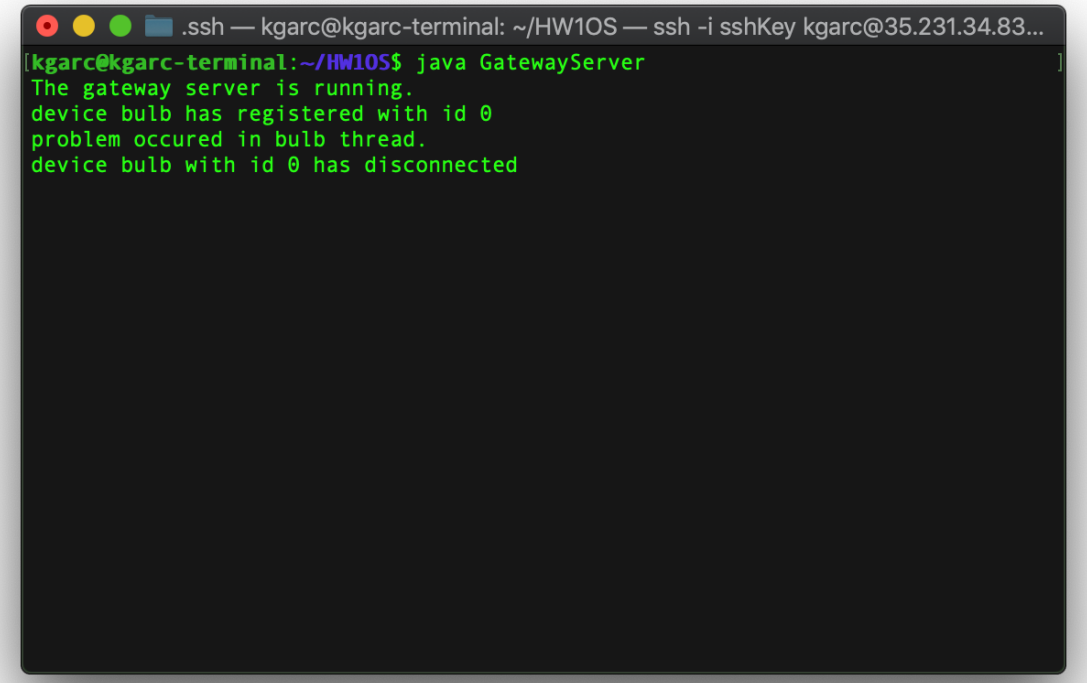
Test Case 26:

Input: SmartBulb stops running unexpectedly.

Pre-requisites: The server and the lightbulb are running.

Expected result: SmartBulb successfully stops, the server keeps running with no error, and server prints out the message “Device bulb with id x has disconnected”, and that thread stops.

Actual result: SmartBulb successfully stops, the server keeps running with no error, and server prints out the message “Device bulb with id x has disconnected”, and that thread stops.



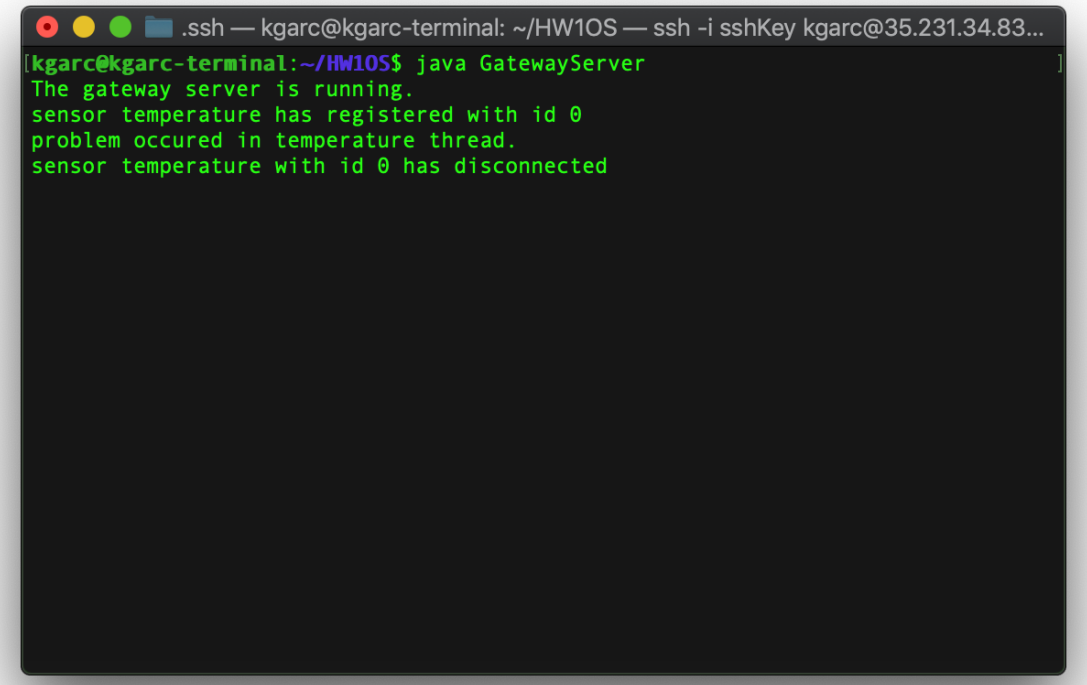
Test Case 27:

Input: Temperature stops running unexpectedly.

Pre-requisites: The server and the temperature sensor are running.

Expected result: Temperature successfully stops, the server keeps running with no error, and server prints out the message “Sensor temperature with id x has disconnected”, and that thread stops.

Actual result: Temperature successfully stops, the server keeps running with no error, and server prints out the message “Sensor temperature with id x has disconnected”, and that thread stops.



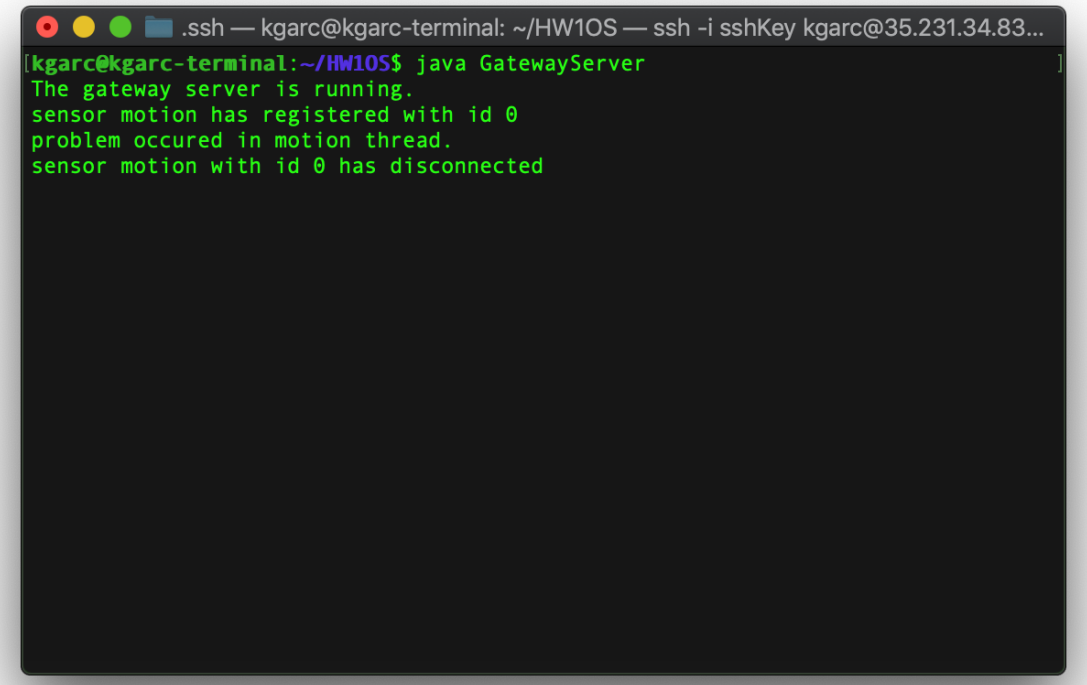
Test Case 28:

Input: Motion stops running unexpectedly.

Pre-requisites: The server and the motion sensor are running.

Expected result: Motion successfully stops, the server keeps running with no error, and server prints out the message “Sensor motion with id x has disconnected”, and that thread stops.

Actual result: Motion successfully stops, the server keeps running with no error, and server prints out the message “Sensor motion with id x has disconnected”, and that thread stops.



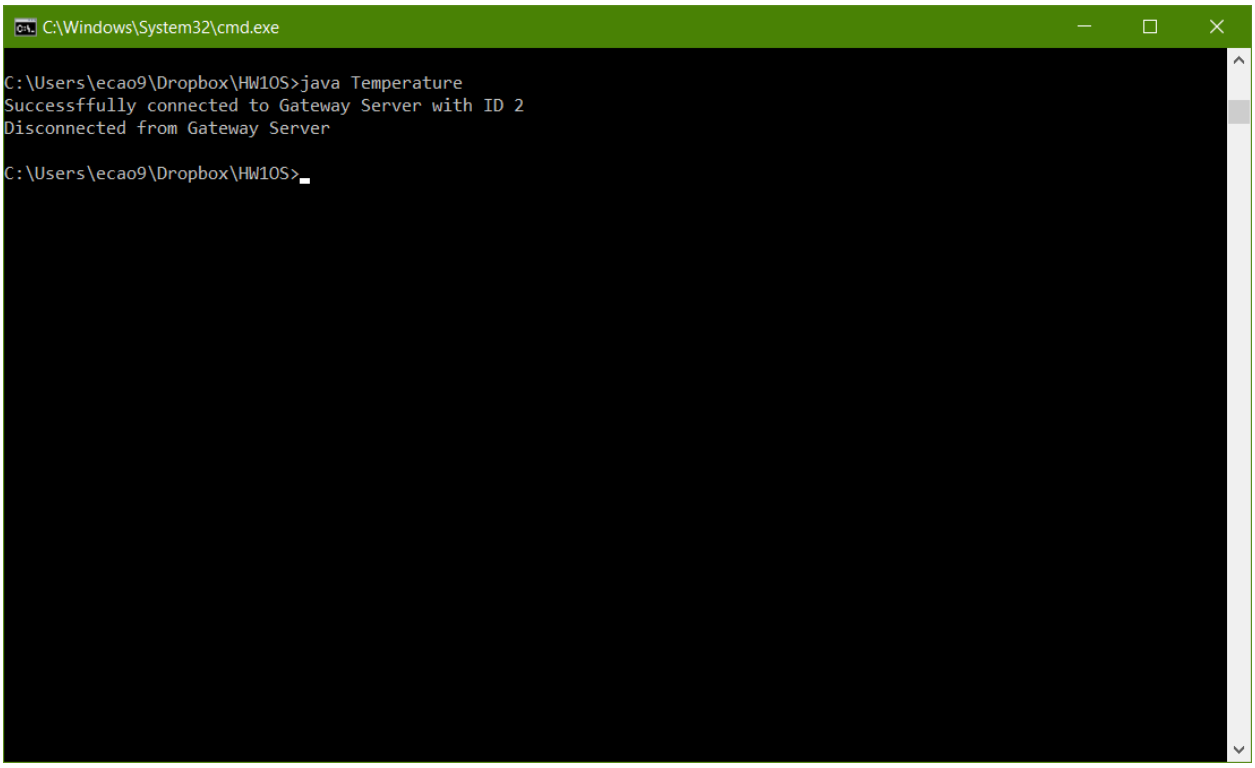
Test Case 29:

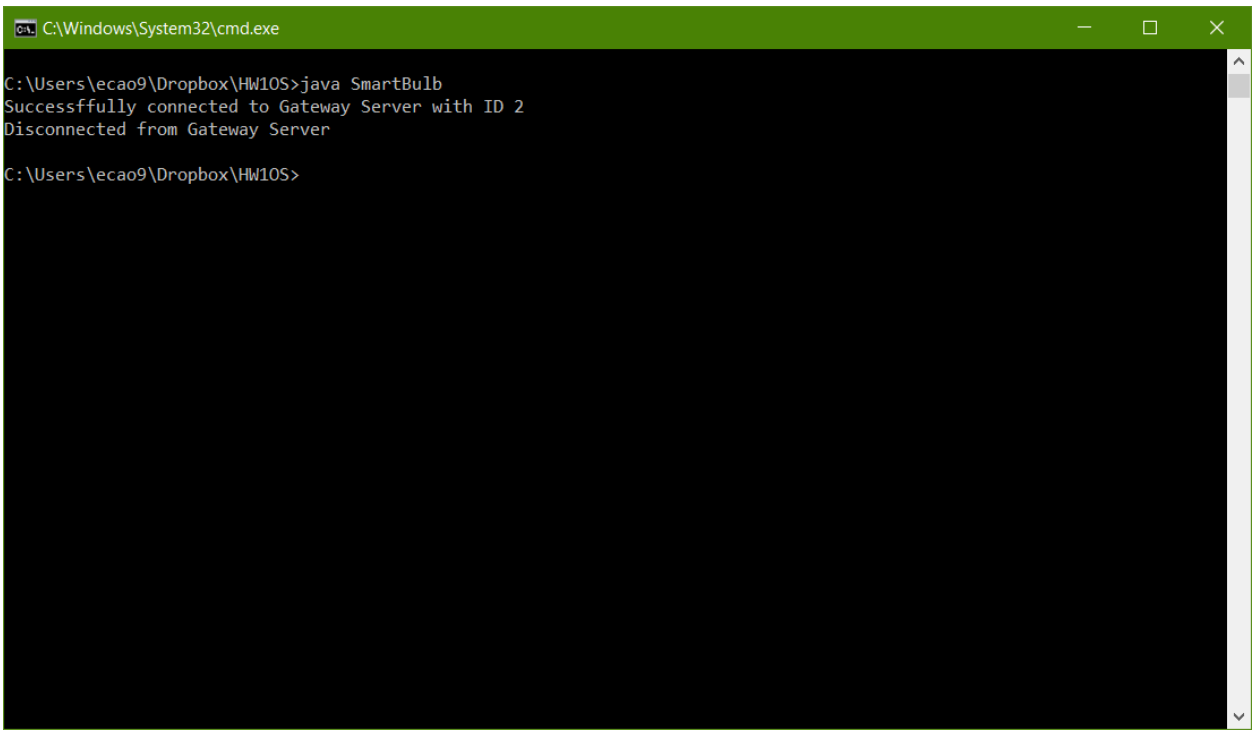
Input: The server stops running unexpectedly.

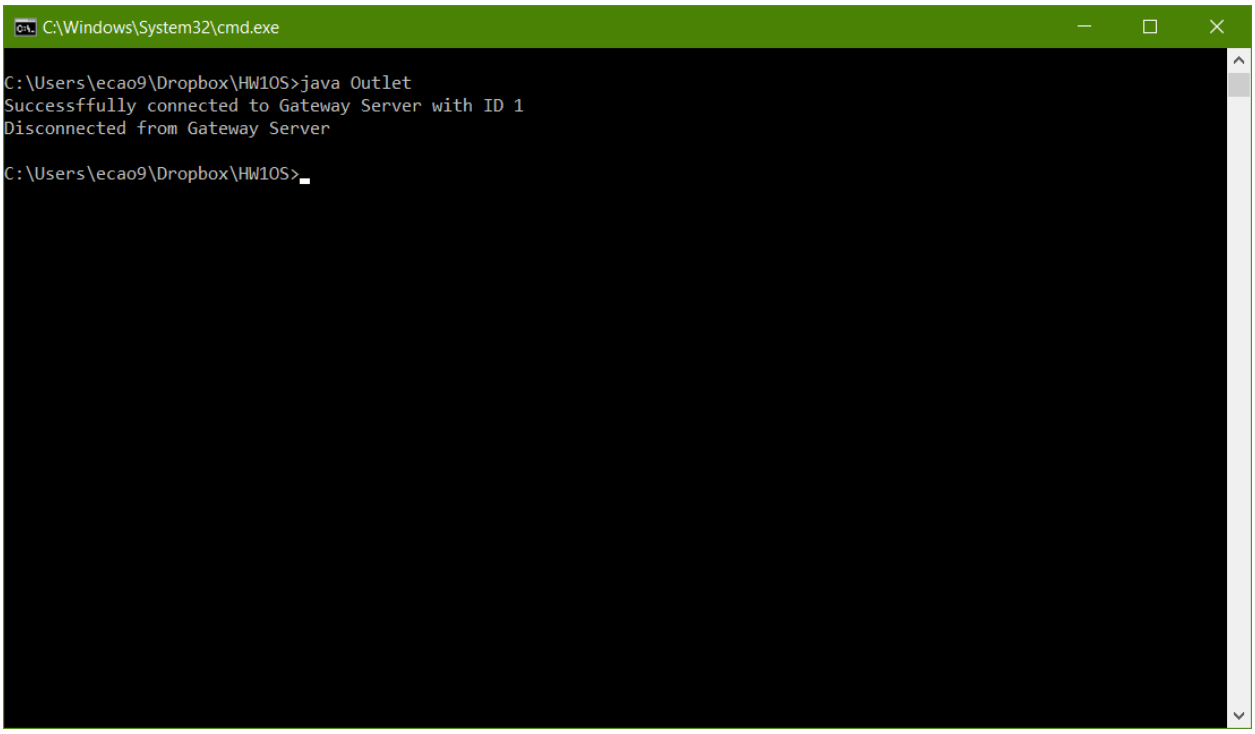
Pre-requisites: The server is running.

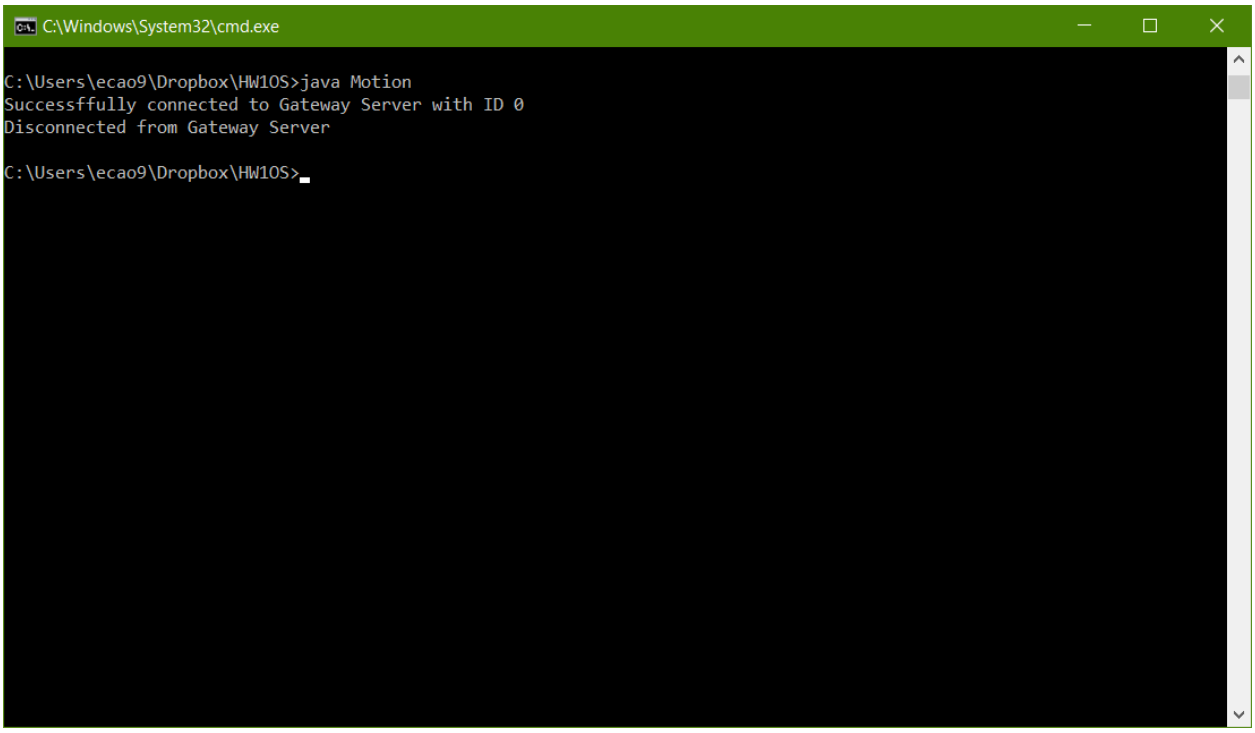
Expected result: The server successfully stops, and any running clients stop with message "Disconnected from Gateway Server."

Actual result: The server successfully stops, and any running clients stop with no error "Disconnected from Gateway Server."


C:\Windows\System32\cmd.exe
C:\Users\ecao9\Dropbox\HW1OS>java Temperature
Successffully connected to Gateway Server with ID 2
Disconnected from Gateway Server
C:\Users\ecao9\Dropbox\HW1OS>


C:\Windows\System32\cmd.exe
C:\Users\ecao9\Dropbox\HW1OS>java SmartBulb
Successffully connected to Gateway Server with ID 2
Disconnected from Gateway Server
C:\Users\ecao9\Dropbox\HW1OS>


C:\Windows\System32\cmd.exe
C:\Users\ecao9\Dropbox\HW1OS>java Outlet
Successffully connected to Gateway Server with ID 1
Disconnected from Gateway Server
C:\Users\ecao9\Dropbox\HW1OS>


C:\Windows\System32\cmd.exe
C:\Users\ecao9\Dropbox\HW1OS>java Motion
Successffully connected to Gateway Server with ID 0
Disconnected from Gateway Server
C:\Users\ecao9\Dropbox\HW1OS>

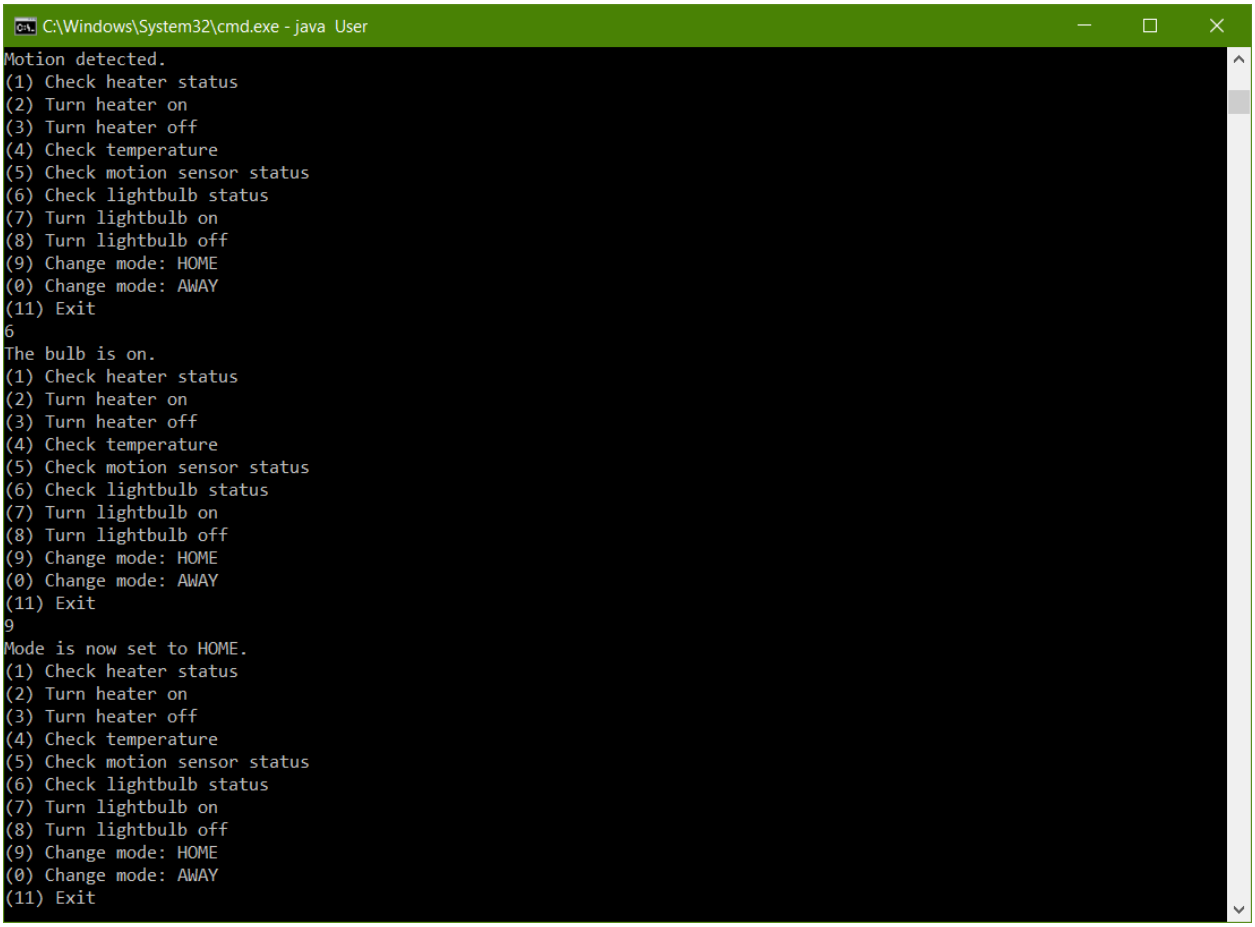
Test Case 30:

Input: Motion has been detected.

Pre-requisites: Mode has been set to HOME and everything is running.

Expected result: The lightbulb is turned on and the user does not receive a text message.

Actual result: The lightbulb is turned on and the user does not receive a text message.



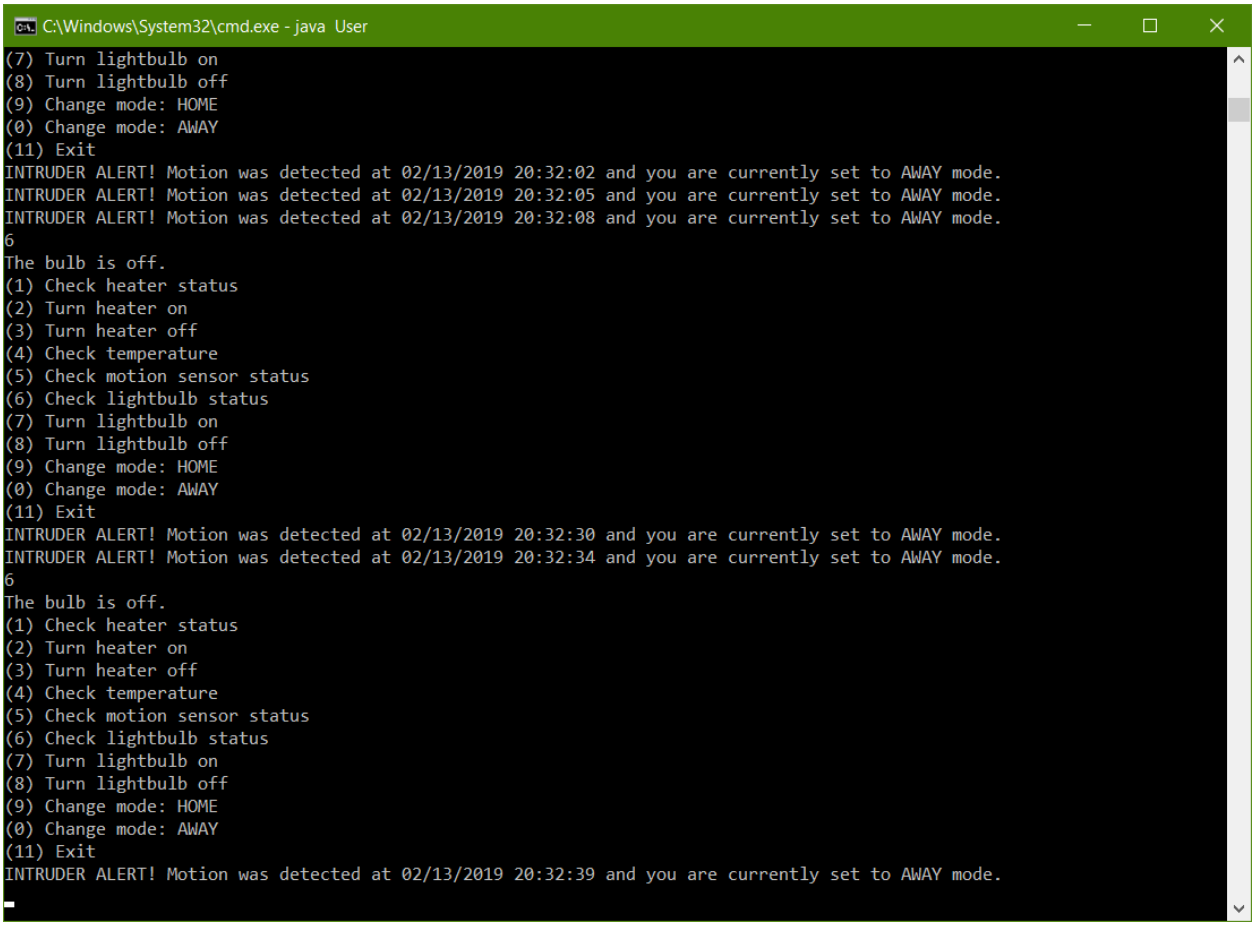
Test Case 31:

Input: Motion has been detected.

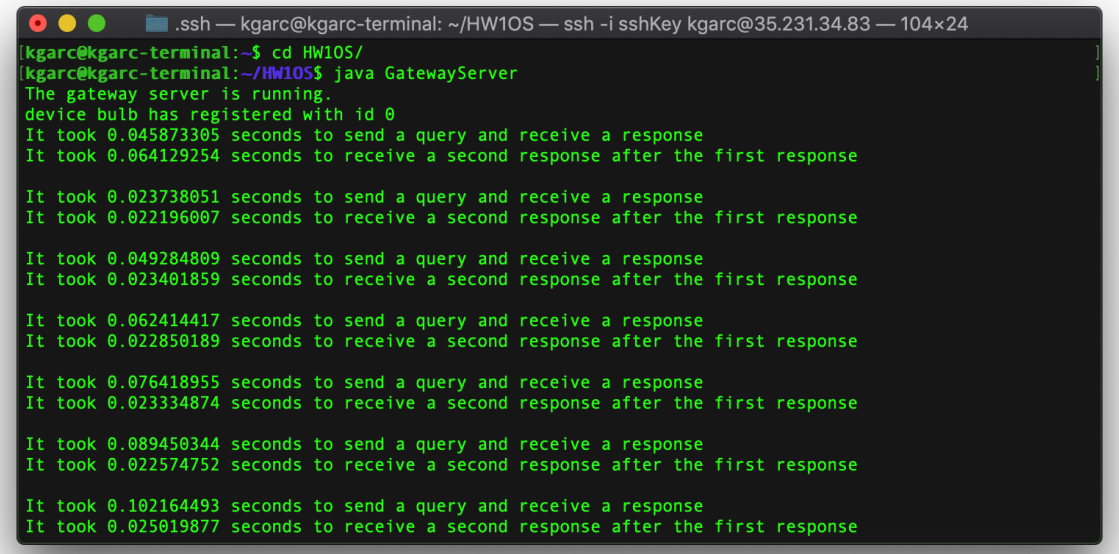
Pre-requisites: Mode has been set to AWAY and everything is running.

Expected result: The lightbulb does not change its status, and the user receives a text message warning about a possible intruder.

Actual result: The lightbulb does not change its status, and the user receives a text message warning about a possible intruder.



Latency



On average it took less than 1/10th of a second to send and receive messages.
On average it took about 0.02 seconds to receive a message without sending one.
We had the server query all the machines without a timer and the server ran into problems with synchronization. We found under our experiments that the server runs best on a timer of five seconds. However, the system still works very well at two seconds. We also found that the rate at which motion generated runs well at once a minute, however this might lead to the bulb not turning off.