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CIS 427-001
Due: February 12, 2022

MatheMagic READ_ME

Instructions to Build and Run:

- Step One: Start the server class.

- Step Two: Start the client class.

- Step Three: Have the client login to the server. If the login is not correct, an error message will be outputted.

- Step Four: Perform any of the following functions within the program: solve or list.

- Step Five: The client will be able to logout and a new client will then be able to log in to the server.

- Step Six: After all the clients are finished with the server, the last client will shutdown the server, which will end the program.

Any Known Problems/Bugs: If you have started the server, but haven't logged into the server as the client and deleted the login text file, the client will not be able to login to the server.

Program Commands:

Main: Creates the login file with valid username, password combos, and the files for each username's solutions, calls the create communication loop while the server still wants to run, and then deletes the files after the server is done being used.

CreateCommunicationLoop: Establishes connection with the client and takes input from the client. Once the client is logged in, the server uses input to determine which functions to call to perform the specified action and logs all input on the server side.

Login: Takes the input from the user and the stream path to the client. Login accesses the login text file and compares the clients inputted username and password with the options from the file, it allows access to the rest of the program and returns the username that logged in if they match, otherwise it tells the user if they have invalid credentials or if their input was not valid.

Solve: Takes the input from the client and will be able to solve the problem based on the commands given. If the client writes "-r", the program will find the perimeter and area of the rectangle using the values that the client has entered. If the client writes "-c", the program will find the circumference and area of the circle using the values that the client has entered. The results of each of the following commands will then be outputted to the client and written into their own solution text file. If the client were to make any errors in regards to entering the necessary information, the server will print out an error message.
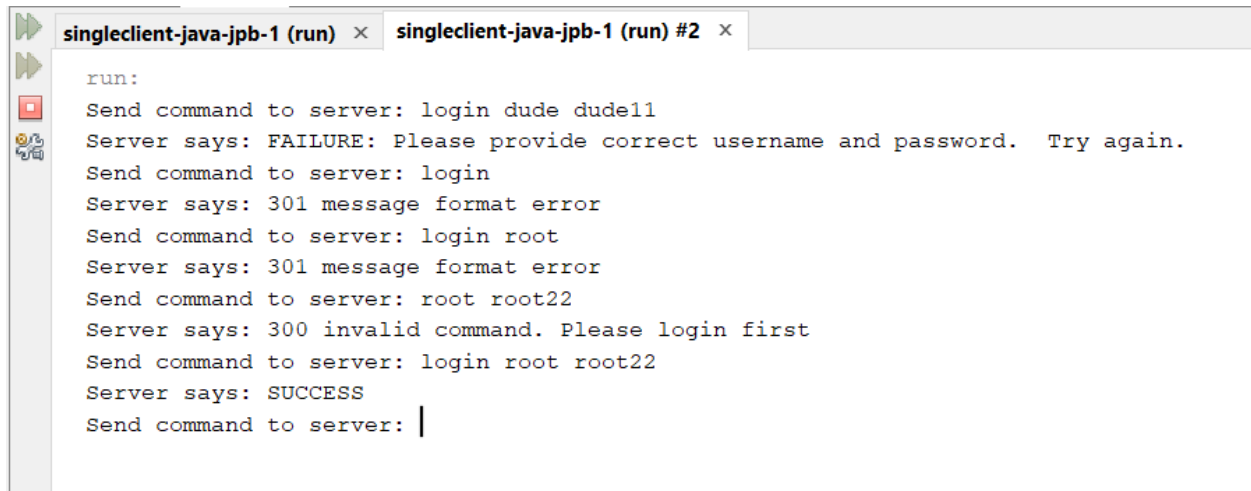
List: Takes the users input, the stream path to the client and the username that's logged in and opens the file associated with the username and reads the contents of what has been inputted then sends that to the client, the login function also validates if the user is root if they input the modifier -all then the solutions files of all the usernames are accessed and sent to the user

Logout: Closes the socket associated with the client and ends the client program, the server stays on and starts the communication loop over and establishes the connection with a new instance of the client when it starts running.

Shutdown: First closes the socket associated with the client and then closes the socket associated with the server, both programs then end.
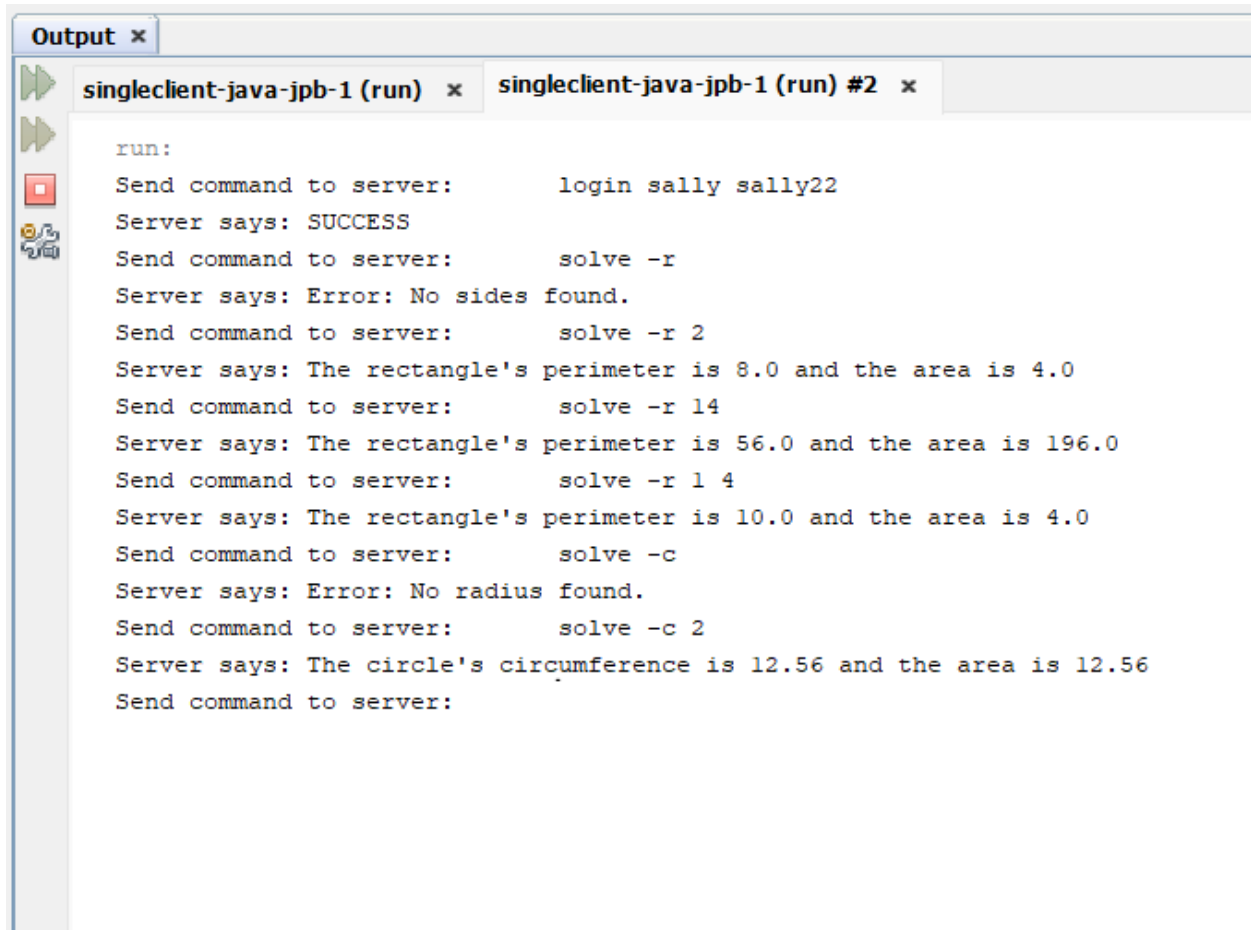
Screenshots:

Login:

```
singleclient-java-jpb-1 (run)  ×    singleclient-java-jpb-1 (run) #2  ×

run:
Send command to server: login dude dude11
Server says: FAILURE: Please provide correct username and password.  Try again.
Send command to server: login
Server says: 301 message format error
Send command to server: login root
Server says: 301 message format error
Send command to server: root root22
Server says: 300 invalid command. Please login first
Send command to server: login root root22
Server says: SUCCESS
Send command to server: |
```

Solve:

```
Output ×

singleclient-java-jpb-1 (run) ×    singleclient-java-jpb-1 (run) #2 ×

   run:
   Send command to server:        login sally sally22
   Server says: SUCCESS
   Send command to server:        solve -r
   Server says: Error: No sides found.
   Send command to server:        solve -r 2
   Server says: The rectangle's perimeter is 8.0 and the area is 4.0
   Send command to server:        solve -r 14
   Server says: The rectangle's perimeter is 56.0 and the area is 196.0
   Send command to server:        solve -r 1 4
   Server says: The rectangle's perimeter is 10.0 and the area is 4.0
   Send command to server:        solve -c
   Server says: Error: No radius found.
   Send command to server:        solve -c 2
   Server says: The circle's circumference is 12.56 and the area is 12.56
   Send command to server:
```

List:

Listing function with only user

```
Send command to server:        list
Server says: sally
    solve -r 2
    The rectangle's perimeter is 8.0 and the area is 4.0
    solve -r
    Error: No sides found.
    solve -r 1 2
    The rectangle's perimeter is 6.0 and the area is 2.0
    solve -c
    Error: No radius found.
    solve -c 2
    The circle's circumference is 12.56 and the area is 12.56
    solve -r
    Error: No sides found.
    solve -r 2
    The rectangle's perimeter is 8.0 and the area is 4.0
    solve -r 14
    The rectangle's perimeter is 56.0 and the area is 196.0
    solve -r 1 4
    The rectangle's perimeter is 10.0 and the area is 4.0
    solve -c
    Error: No radius found.
    solve -c 2
    The circle's circumference is 12.56 and the area is 12.56
Send command to server:
```
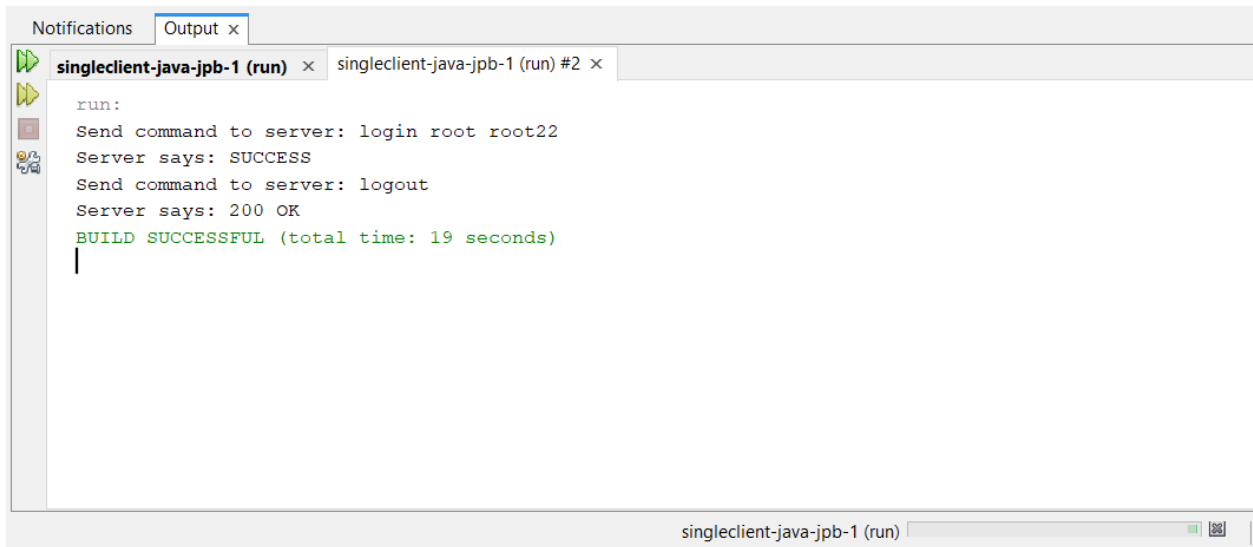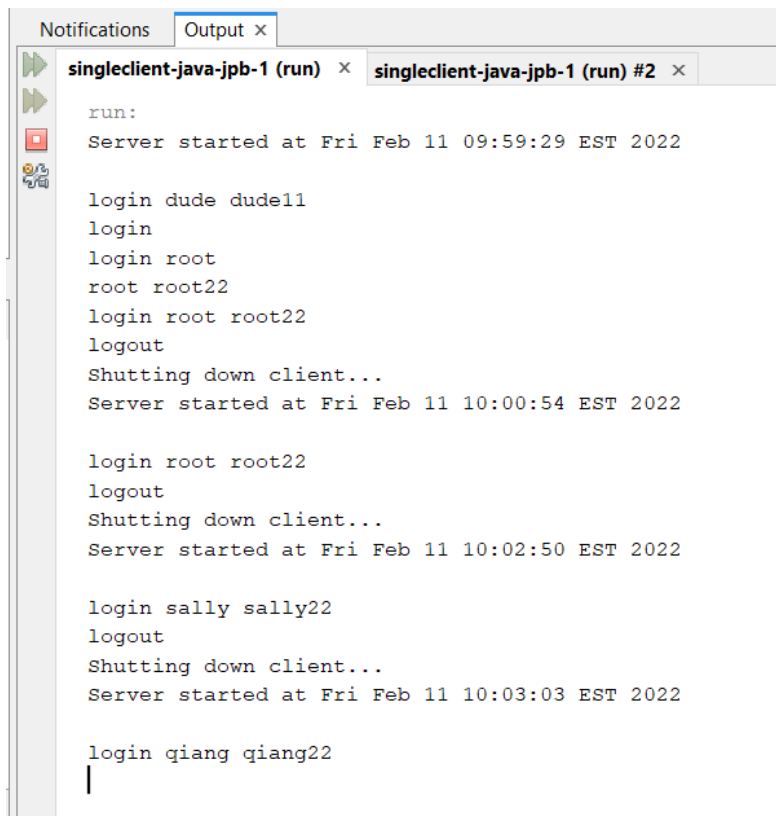
Listing function where root calls all the lists

```
Send command to server:        list -all
Server says:
root
    solve -r 2
    The rectangle's perimeter is 8.0 and the area is 4.0
john
    solve
    301 message format error
    solve -r 2 2
    The rectangle's perimeter is 8.0 and the area is 4.0
    solve -r 5
    The rectangle's perimeter is 20.0 and the area is 25.0
    solve -r
    Error: No sides found.
    solve -c
    Error: No radius found.
    solve -c 5
    The circle's circumference is 31.400000000000002 and the area is 78.5
    solve -c 2
    The circle's circumference is 12.56 and the area is 12.56


sally
    solve -r 2
    The rectangle's perimeter is 8.0 and the area is 4.0
    solve -r
    Error: No sides found.
    solve -r 1 2
    The rectangle's perimeter is 6.0 and the area is 2.0
    solve -c
    Error: No radius found.
    solve -c 2
    The circle's circumference is 12.56 and the area is 12.56
    solve -r
    Error: No sides found.
    solve -r 2
    The rectangle's perimeter is 8.0 and the area is 4.0
    solve -r 14
    The rectangle's perimeter is 56.0 and the area is 196.0
    solve -r 1 4
    The rectangle's perimeter is 10.0 and the area is 4.0
    solve -c
    Error: No radius found.
    solve -c 2
    The circle's circumference is 12.56 and the area is 12.56
qiang
    No interactions yet
Send command to server:
```

Logout:

```
run:
Send command to server: login root root22
Server says: SUCCESS
Send command to server: logout
Server says: 200 OK
BUILD SUCCESSFUL (total time: 19 seconds)
```

```
run:
Server started at Fri Feb 11 09:59:29 EST 2022

login dude dude11
login
login root
root root22
login root root22
logout
Shutting down client...
Server started at Fri Feb 11 10:00:54 EST 2022

login root root22
logout
Shutting down client...
Server started at Fri Feb 11 10:02:50 EST 2022

login sally sally22
logout
Shutting down client...
Server started at Fri Feb 11 10:03:03 EST 2022

login qiang qiang22
```

Shutdown:

Notifications | Output ×

singleclient-java-jpb-1 (run) × | singleclient-java-jpb-1 (run) #2 ×

```
run:
Send command to server: login root root22
Server says: SUCCESS
Send command to server: shutdown
Server says: 200 OK
BUILD SUCCESSFUL (total time: 8 seconds)
|
```

Notifications | Output ×

singleclient-java-jpb-1 (run) × | singleclient-java-jpb-1 (run) #2 ×

```
run:
Server started at Fri Feb 11 10:05:02 EST 2022

login root root22
shutdown
Shutting down server...
deleting
deleted files
BUILD SUCCESSFUL (total time: 10 seconds)
|
```