

# **GTU Department of Computer Engineering**

**CSE 222/505 - Spring 2023**

Homework #3 Report

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# **1) SYSTEM REQUIREMENTS**

We were asked to design and implement basic social media software that provides sharing posts with people. Now, it was requested to add extra methods such as uncomment, unlike, unfollow, and unblock to the social media platform.

The program was developed in the specified java versions:

openjdk version "16.0.1" 2021-04-20

OpenJDK Runtime Environment (build 16.0.1+9-Ubuntu-120.04)

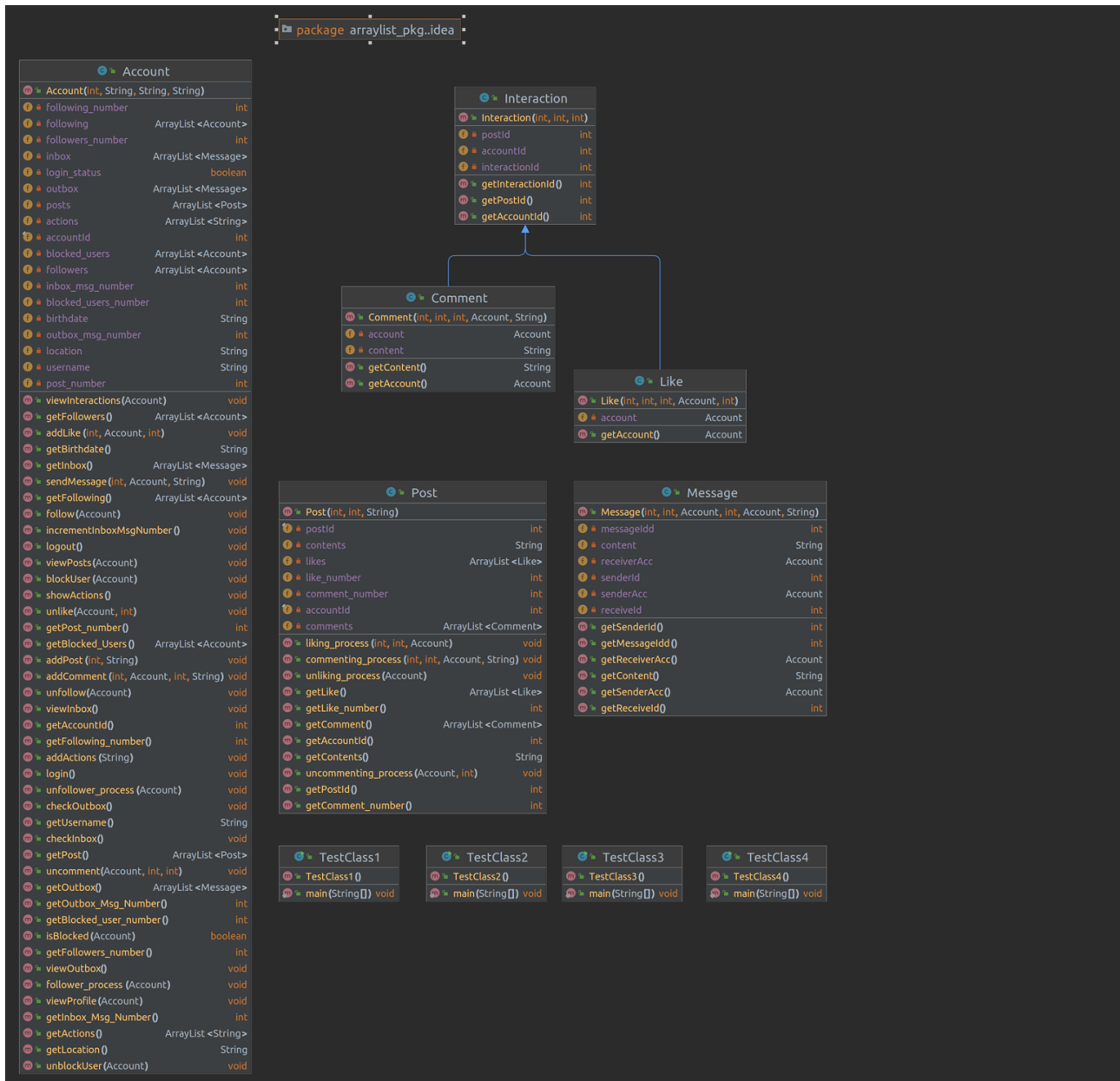
OpenJDK 64-Bit Server VM (build 16.0.1+9-Ubuntu-120.04, mixed mode, sharing)

The system is a social media platform that allows users to create an account, share posts, follow other users, view profiles, send and receive messages, and block users. The system requires users to provide a username, birthdate, and location when creating an account. Users must log in to access the system's features. The system also allows users to block other users. The system should maintain the following information for each user:

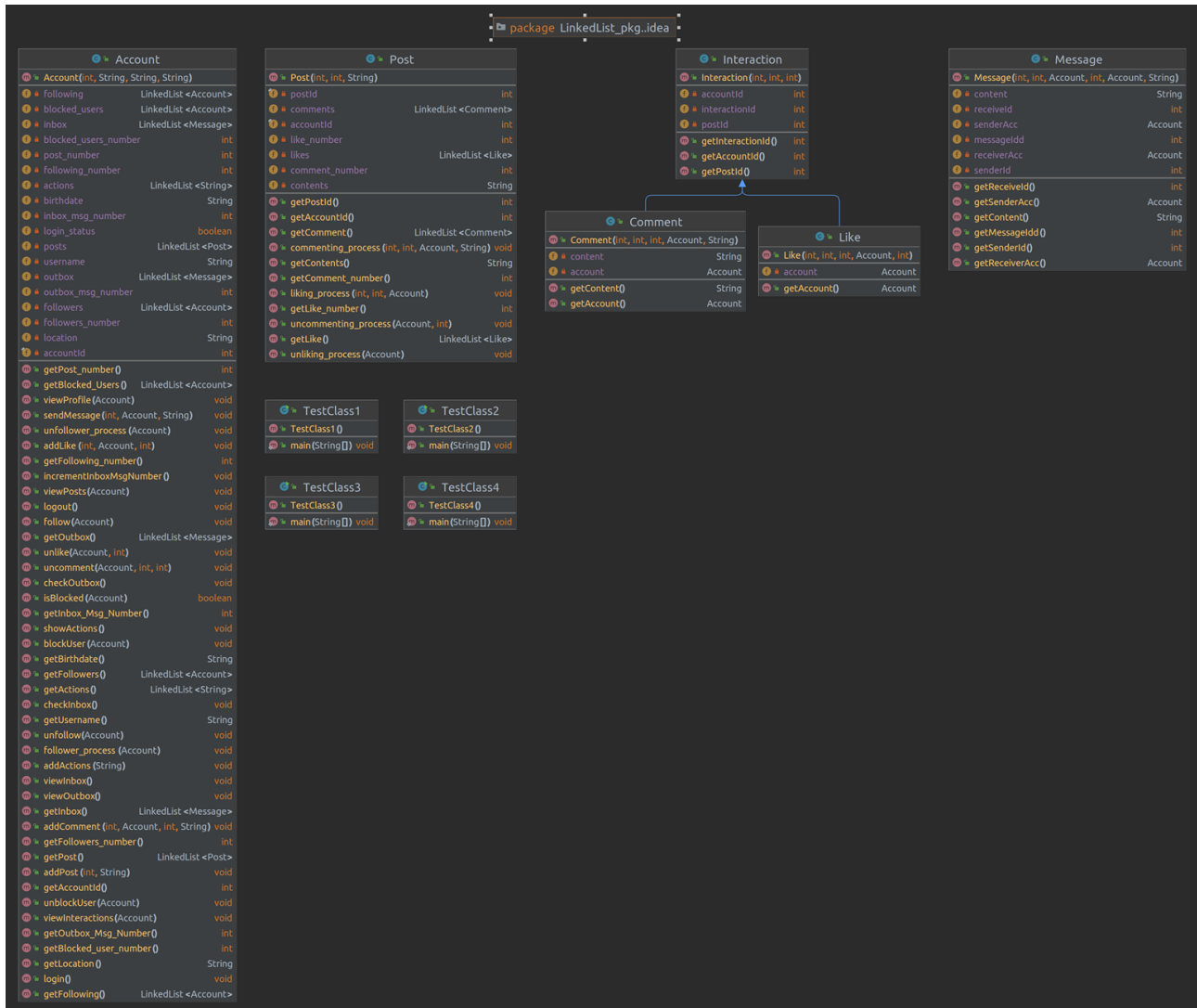
- User ID
- Username
- Birthdate
- Location
- Posts
- Following Accounts
- Followers
- Inbox (Messages Received)
- Outbox (Messages Sent)
- Blocked Accounts

## 2) DIAGRAMS

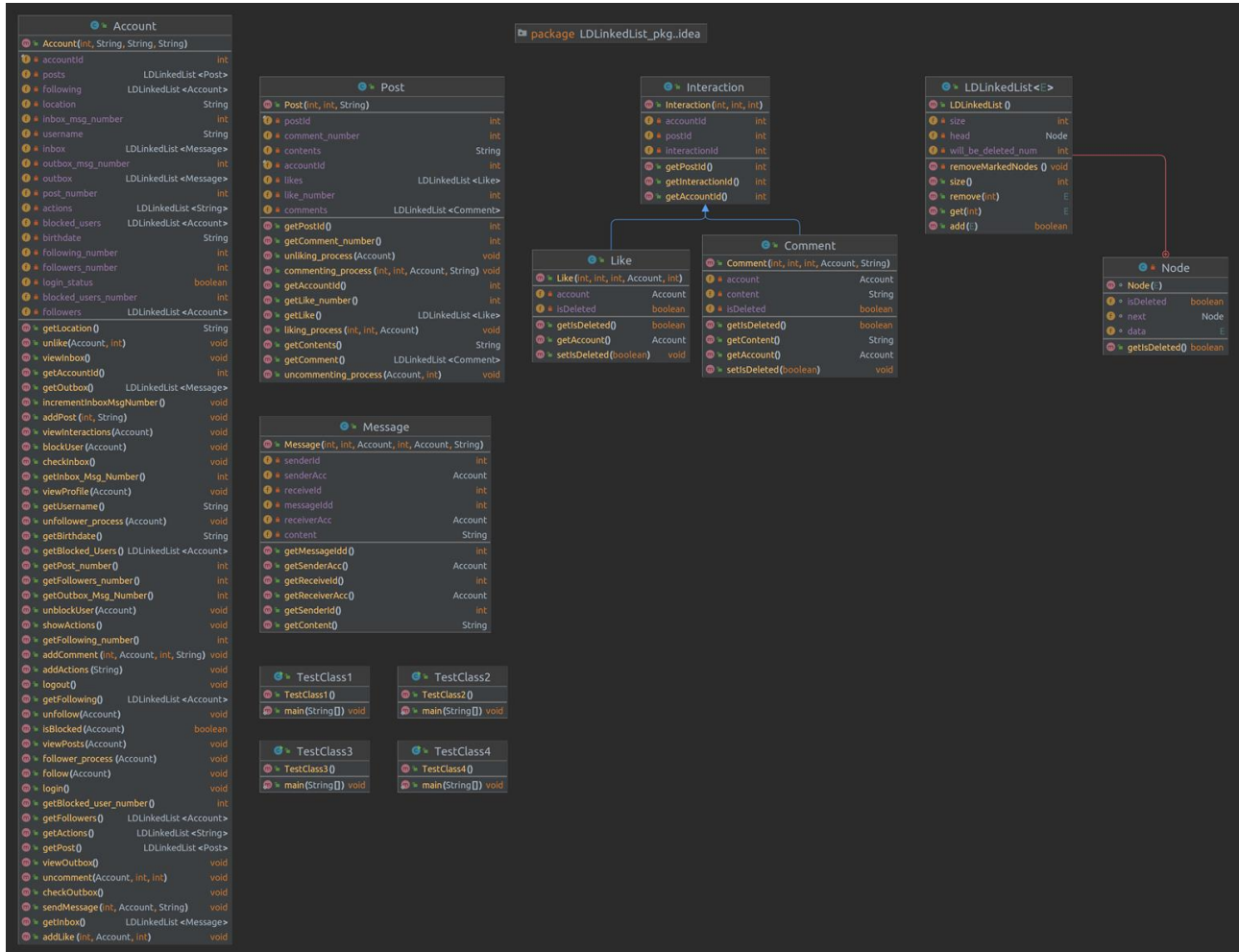
For arraylist\_pkg :



For LinkedList\_pkg :



For LDLinkedList\_pkg:



### **3)Problem solutions approach**

First, an account needs to be created with the necessary information. In order for the account to perform actions, it must first log in. Whether or not a user has logged in is checked using the `login_status` variable stored in the Account class. If any method is attempted to be executed without logging in, the system will issue a warning. Multiple users can log into the system at the same time. It is not necessary to follow an account to view its profile or posts. However, in order to send a message to another account, that account must be followed. The people a user is following are stored in an array called "following," while the user's followers are stored in an array called "followers." An account can block another account, which will prevent that account from accessing any information from the blocking account. The blocked accounts are stored in an array called "blocked\_users." Accounts can share new posts using the "addPost()" method. All posts shared by an account are stored in an array called "posts," and can be viewed, liked, and commented on by other accounts. Information about the number of likes and comments, as well as the people who liked and commented on the post, are stored in the Post class. Accounts can also send messages to each other, with sent messages being stored in the "outbox" array of the sender and received messages being stored in the "inbox" array of the recipient.

It was requested to add extra methods such as uncomment, unlike, unfollow, and unblock to the social media platform. All of these things that need to be removed are kept in different packages in ArrayList, LinkedList, and our own created LDLinkedList data structures in hw3. In the requested methods, the suitability of the operation is checked first, and if it is suitable, it is removed from the data structure it is in. When we say the suitability of the operation, for example, in order to perform the unfollow operation, it is required that the account to be unfollowed must first be followed. Because you cannot unfollow an account that you are not following

### **4)Time complexity analysis**

#### **Iterating(Searching) over elements**

- Simple array:  $O(n)$
- ArrayList:  $O(n)$
- LinkedList:  $O(n)$
- LDLinkedList:  $O(n)$

All four data structures have linear time complexity for iterating over their elements, as you need to visit each element once.

#### **Accessing an element**

- Simple array:  $O(1)$
- ArrayList:  $O(1)$
- LinkedList:  $O(n)$
- LDLinkedList:  $O(n)$

### **Adding an element**

- Simple array:  $O(1)$  (when there's enough space),  $O(n)$  (when you need to resize the array)
- ArrayList:  $O(1)$  (when there's enough space),  $O(n)$  (when you need to resize the underlying array) (But we can assume reallocation is effectively an  $O(1)$  operation)
- LinkedList:  $O(1)$  (when you add to the beginning or end)  $O(n)$  (when you add to the middle)
- LDLinkedList:  $O(1)$  (when you add to the beginning)  $O(n)$  (when you add to the end or middle)

Adding an element to the end of an array or an ArrayList with enough capacity has a constant time complexity. However, if there's not enough capacity, you need to create a new, larger array and copy the elements over, which has a linear time complexity. Adding an element to a LinkedList has a constant time complexity, as you just need to create a new node and update a few pointers.

### **Removing an element**

- Simple array:  $O(n)$  (when you remove from the middle or beginning)
- ArrayList:  $O(n)$  (when you remove from the middle or beginning),  $O(1)$  (when you remove from the end)
- LinkedList:  $O(1)$  (when you remove from the beginning or end),  $O(n)$  (when you remove from the middle)
- LDLinkedList:  $O(1)$  (when you remove from the beginning),  $O(n)$  (when you remove from the end or middle)

Removing an element from the end of an ArrayList or a LinkedList has a constant time complexity, as you just need to update a few pointers. Removing an element from the beginning of a LinkedList also has a constant time complexity. However, removing an element from the middle or beginning of an array or an ArrayList requires shifting all the subsequent elements down by one index, which has a linear time complexity.

Overall, arrays and ArrayLists have similar time complexity for most operations, but LinkedLists can be faster for adding or removing elements from the beginning or end, while arrays and ArrayLists are better suited for random access to elements.

### **Time Complexities of Account Class Methods in Homework1 Package:**

(simple array)

- addPost() =  $O(1)$   
(because adding to end in array has  $O(1)$  time complexity)
- follow() =  $O(1)$
- unfollow() =  $O(N)$
- viewProfile() =  $O(N)$

- viewPosts() =  $O(N)$
- addLike() =  $O(N)$
- unlike() =  $O(N)$
- addComment() =  $O(N)$
- uncomment() =  $O(N)$
- viewInteractions() =  $O(N*M)$

(The time complexity of this method is  $O(n*m)$ , where  $n$  is the number of posts of the account being viewed and  $m$  is the average number of likes or comments per post. This is because the method loops through each post of the account, and for each post, it loops through the likes and comments of the post.)

- sendMessage() =  $O(N)$
- checkOutbox() =  $O(1)$
- checkInbox() =  $O(1)$
- viewInbox() =  $O(N)$
- viewOutbox() =  $O(N)$
- blockUser() =  $O(N)$
- unblockUser() =  $O(N)$
- showActions() =  $O(N)$

### **Time Complexities of Account Class Methods in ArrayList Package:**

- addPost() =  $O(1)$
- (because adding to end in arraylist has  $O(1)$  time complexity)
- follow() =  $O(1)$
  - unfollow() =  $O(N)$
  - viewProfile() =  $O(N)$
  - viewPosts() =  $O(N)$
  - addLike() =  $O(N)$
  - unlike() =  $O(N)$
  - addComment() =  $O(N)$
  - uncomment() =  $O(N)$
  - viewInteractions() =  $O(N*M)$

(The time complexity of this method is  $O(n*m)$ , where  $n$  is the number of posts of the account being viewed and  $m$  is the average number of likes or comments per post. This is because the method loops through each post of the account, and for each post, it loops through the likes and comments of the post.)

- sendMessage() =  $O(N)$
- checkOutbox() =  $O(1)$
- checkInbox() =  $O(1)$
- viewInbox() =  $O(N)$
- viewOutbox() =  $O(N)$
- blockUser() =  $O(N)$
- unblockUser() =  $O(N)$
- showActions() =  $O(N)$



### **Time Complexities of Account Class Methods in LinkedList\_pkg Package:**

- addPost() =  $O(1)$

(Since we add element to end of the LinkedList, adding process has  $O(1)$  time complexity)

- follow() =  $O(1)$

- unfollow() =  $O(N^2)$

(Because get() method of LinkedList has  $O(N)$  time complexity)

- viewProfile() =  $O(N^2)$

- viewPosts() =  $O(N^2)$  where N is Post list size.

- addLike() =  $O(N^2)$  where N is Post list size

- unlike() =  $O(N^2)$  where N is Post list size

- addComment() =  $O(N^2)$  where N is Post list size

- uncomment() =  $O(N^2)$  where N is Post list size

- viewInteractions() =  $O(N*M*K)$

(The time complexity of this method is  $O(n*m)$ , where n is the number of posts of the account being viewed and m is the average number of likes or comments per post. This is because the method loops through each post of the account, and for each post, it loops through the likes and comments of the post. K is the complexity expression from the get() method)

- sendMessage() =  $O(N^2)$  where N is following list size

- checkOutbox() =  $O(1)$

- checkInbox() =  $O(1)$

- viewInbox() =  $O(N^2)$  where N is inbox list size

- viewOutbox() =  $O(N^2)$  where N is outbox list size

- blockUser() =  $O(N^2)$  because this method calls unfollow method which has  $O(N^2)$  complexity

- unblockUser() =  $O(N^2)$  where N is blocked\_users list size

- showActions() =  $O(N^2)$  where N is action list size

### **Time Complexities of Account Class Methods in LDLinkedList\_pkg Package:**

- addPost() =  $O(N)$

(Since we add element to end of the LDLinkedList, adding process has  $O(N)$  time complexity)

- follow() =  $O(N)$

- unfollow() =  $O(N^2)$  where N is following list size

(Because get() method of LinkedList has  $O(N)$  time complexity)

- viewProfile() =  $O(N^2)$

- viewPosts() =  $O(N^2)$  where N is Post list size.

- addLike() =  $O(N^2)$  where N is Post list size

- unlike() =  $O(N^2)$  where N is Post list size

- addComment() =  $O(N^2)$  where N is Post list size

- uncomment() =  $O(N^2)$  where N is Post list size

- viewInteractions() =  $O(N*M*K)$

(The time complexity of this method is  $O(n*m)$ , where n is the number of posts of the account being viewed and m is the average number of likes or comments per post. This is because the method loops through each post of the account, and for each post, it loops through the likes and comments of the post. K is the complexity expression from the get() method)

- sendMessage() =  $O(N^2)$  where N is following list size

- checkOutbox() =  $O(1)$
- checkInbox() =  $O(1)$
- viewInbox() =  $O(N^2)$  where N is inbox list size
- viewOutbox() =  $O(N^2)$  where N is outbox list size
- blockUser() =  $O(N^2)$  because this method calls unfollow method which has  $O(N^2)$  complexity
- unblockUser() =  $O(N^2)$  where N is blocked\_users list size
- showActions() =  $O(N^2)$  where N is action list size

## **5)Experimental Running Time**

Implementation Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Basic Array Structure (HW1)	0.010899429	0.013052423	0.011497711	Not available
Array List Structure (a)	0.018440380	0.020674210	0.019103122	0.034472778
Linked List Structure (b)	0.018617942	0.020901971	0.019525511	0.033825094
LD Linked List Structure (c)	0.019103421	0.021326277	0.019967917	0.033960306

Because we had few input, we could not see the relationships between the experimental result and the theoretical time complexity calculations. But as we can see from the table, array structure has the best performance among them in TestClass1, TestClass2 and TestClass2. Because we set the array capacity as 50. And we never resize it. Also we never remove an element in middle of the array so we never reallocate it. If we did resize and remove operations probably we would see arraylist is more efficient. LinkedList data structure is slower than the ArrayList as we calculate in theoretical running time. Because we use get() method so many times and get() method has  $O(N)$  time complexity in LinkedList but it has  $O(1)$  time complexity in ArrayList. LDLinkedList is the slowest. While the add() method in other data structures has  $O(1)$  time complexity, in LDLinkedList the add() method, that is, adding elements to the end of the list, has  $O(N)$  time complexity.

## **6)TEST CASES**

To see the Test Cases, run TestClass1, TestClass2 and TestClass3 according to the instructions in a "RUNNING COMMAND AND RESULTS" section

## **7)RUNNING COMMAND AND RESULTS**

The project files are in the packages named arraylist\_pkg, LinkedList\_pkg, LDLinkedList\_pkg. While in the directory where the these package is located, compile the files by entering the following command. :

```
javac */*.java
```

Enter the following commands here, depending on which class you want to run:

```
java arraylist_pkg.TestClass1  
java arraylist_pkg.TestClass2  
java arraylist_pkg.TestClass3  
java arraylist_pkg.TestClass4
```

```
java LinkedList_pkg.TestClass1  
java LinkedList_pkg.TestClass2  
java LinkedList_pkg.TestClass3  
java LinkedList_pkg.TestClass4
```

```
java LDLinkedList_pkg.TestClass1  
java LDLinkedList_pkg.TestClass2  
java LDLinkedList_pkg.TestClass3  
java LDLinkedList_pkg .TestClass4
```

### **Output of**

```
java arraylist_pkg.TestClass1  
java LinkedList_pkg.TestClass1  
java LDLinkedList_pkg.TestClass1
```

pentagon@Pentagon: ~/Desktop/UNI/2. sene/CSE 22... x    pentagon@Pentagon: ~/Desktop/UNI/2. sene/CSE 22... x

```
pentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1/homework1$ javac *.java
pentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1/homework1$ cd ..
pentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1$ java homework1.TestClass1
```

Step 1...Creating accounts...

An account with username Gizem Süngü has been created.  
An account with username Sibel Gülmez has been created.  
An account with username Gökhan Kaya has been created.

Step 2...

Logging into an account (username: Sibel Gülmez).

Step 3... Sharing two posts...

The post has been shared: I like Java.  
The post has been shared: Java is better than coffee

Step 4...Following gizemsungu and gokhankaya...

You are following Gizem Süngü  
You are following Gökhan Kaya

Step 5...

Logging out from account 'Sibel Gülmez'.

Step 6...

Logging into an account (username: Gökhan Kaya).

Step 7...

...Viewing Sibel Gülmez's profile...

-----

User ID: 1  
Username: Sibel Gülmez  
Location: Gebze  
Birth Date: 07.05.1996  
Sibel Gülmez is following 2 account(s) and has 0 follower(s)  
The followers of Sibel Gülmez are:  
Sibel Gülmez is following: Gizem Süngü, Gökhan Kaya,  
Sibel Gülmez has 2 posts

Step 8...

...Viewing Sibel Gülmez 's posts...  
(PostID: 0) Sibel Gülmez: I like Java.  
(PostID: 1) Sibel Gülmez: Java is better than coffee

Step 9...  
Liking a post of Sibel Gülmez...

Step 10...  
Adding a comment on a post of Sibel Gülmez : me too!...  
Adding a comment on a post of Sibel Gülmez : Absolutely I agree...

Step 11...  
You are following Sibel Gülmez  
You are following Gizem Süngü

Step 12...  
Sending a message to Gizem Süngü...: This homework is too easy

Step 13...  
Logging out from account 'Gökhan Kaya'.

Step 14...  
Logging into an account (username: Gizem Süngü).

Step 15...Checking outbox...  
There is/are 0 message(s) in the outbox.

Step 16...Checking inbox...  
There is/are 1 message(s) in the inbox.

Step 17...  
...Viewing inbox...  
-----  
Message ID: 0  
From: Gökhan Kaya  
To: Gizem Süngü  
Message: This homework is too easy

Step 18...  
...Viewing Sibel Gülmez's profile...  
-----  
User ID: 1  
Username: Sibel Gülmez  
Location: Gebze  
Birth Date: 07.05.1996  
Sibel Gülmez is following 2 account(s) and has 1 follower(s)  
The followers of Sibel Gülmez are: Gökhan Kaya,

```

Sibel Gülmez is following: Gizem Süngü, Gökhan Kaya,
Sibel Gülmez has 2 posts

Step 19...
...Viewing Sibel Gülmez 's posts...
(PostID: 0) Sibel Gülmez: I like Java.
(PostID: 1) Sibel Gülmez: Java is better than coffee

Step 20...
Viewing Sibel Gülmez's posts' interactions...
-----
(Post Id: 0) : I like Java.
The post was liked by the following account(s): Gökhan Kaya,
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'me too!'
-----
(Post Id: 1) : Java is better than coffee
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'Absolutely I agree'
-----

Step 21...
Liking a post of Sibel Gülmez...

Step 22...
Viewing Sibel Gülmez's posts' interactions...
-----
(Post Id: 0) : I like Java.
The post was liked by the following account(s): Gökhan Kaya, Gizem Süngü,
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'me too!'
-----
(Post Id: 1) : Java is better than coffee
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'Absolutely I agree'
-----
-----pentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1$ █

```

## Output of

```

java arraylist_pkg.TestClass2
java LinkedList_pkg.TestClass2
java LDLinkedList_pkg.TestClass2

```

```
-----pentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1$ java homework1.TestClass2
```

Step 1...Creating accounts...

An account with username Gizem SÜNGÜ has been created.  
An account with username Sibel GÜLMEZ has been created.  
An account with username Gökhan Kaya has been created.

Step 2...

Logging into an account (username: Sibel GÜLMEZ).

Step 3... Sharing two posts...

The post has been shared: I like Java.  
The post has been shared: Java is better than coffee

Step 4...Following gizemsungu and gokhankaya...

You are following Gizem SÜNGÜ  
You are following Gökhan Kaya

Step 5...

Logging out from account 'Sibel GÜLMEZ'.

Step 6...

Logging into an account (username: Gökhan Kaya).

Step 7...

...Viewing Sibel GÜLMEZ's profile...

-----

User ID: 1

Username: Sibel GÜLMEZ

Location: Gebze

Birth Date: 07.05.1996

Sibel GÜLMEZ is following 2 account(s) and has 0 follower(s)

The followers of Sibel GÜLMEZ are:

Sibel GÜLMEZ is following: Gizem SÜNGÜ, Gökhan Kaya,

Sibel GÜLMEZ has 2 posts

Step 8...

...Viewing Sibel GÜLMEZ 's posts...

(PostID: 0) Sibel GÜLMEZ: I like Java.

(PostID: 1) Sibel GÜLMEZ: Java is better than coffee

Step 9...

Liking a post of Sibel GÜLMEZ...

Step 10...  
Adding a comment on a post of Sibel Gülmez : me too!...  
Adding a comment on a post of Sibel Gülmez : Absolutely I agree...

Step 11...  
You are following Sibel Gülmez  
You are following Gizem Süngü

Step 12...  
Sending a message to Gizem Süngü...: This homework is too easy

Step 13...  
Logging out from account 'Gökhan Kaya'.

Step 14...  
Logging into an account (username: Gizem Süngü).

Step 15...Checking outbox...  
There is/are 0 message(s) in the outbox.

Step 16...Checking inbox...  
There is/are 1 message(s) in the inbox.

Step 17...  
...Viewing inbox...  
-----  
Message ID: 0  
From: Gökhan Kaya  
To: Gizem Süngü  
Message: This homework is too easy

Step 18...  
...Viewing Sibel Gülmez's profile...  
-----  
User ID: 1  
Username: Sibel Gülmez  
Location: Gebze  
Birth Date: 07.05.1996  
Sibel Gülmez is following 2 account(s) and has 1 follower(s)  
The followers of Sibel Gülmez are: Gökhan Kaya,  
Sibel Gülmez is following: Gizem Süngü, Gökhan Kaya,  
Sibel Gülmez has 2 posts



```
Step 19...
...Viewing Sibel Gülmez 's posts...
(PostID: 0) Sibel Gülmez: I like Java.
(PostID: 1) Sibel Gülmez: Java is better than coffee
```

```
Step 20...
Viewing Sibel Gülmez's posts' interactions...
-----
(Post Id: 0) : I like Java.
The post was liked by the following account(s): Gökhan Kaya,
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'me too!'
-----
(Post Id: 1) : Java is better than coffee
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'Absolutely I agree'
-----
```

```
Step 21...
Liking a post of Sibel Gülmez...
```

```
Step 22...
Viewing Sibel Gülmez's posts' interactions...
-----
(Post Id: 0) : I like Java.
The post was liked by the following account(s): Gökhan Kaya, Gizem Süngü,
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'me too!'
-----
(Post Id: 1) : Java is better than coffee
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'Absolutely I agree'
-----
```

```
Step 23...
The post has been shared: The Java: no nice frameworks, just horrifying definitions and pain.
```

```
Step 24...
The post has been shared: Everybody is chill until StackOverflow says that you are the first one to ask this question.
```

```
Step 25...
Logging out from account 'Gizem Süngü'.
```

```
Step 26...
```

Thunderbird Mail

Logging into an account (username: Sibel Gülmez).

Step 27...

...Viewing Gizem Süngü's profile...

-----

User ID: 0

Username: Gizem Süngü

Location: Izmir

Birth Date: 01.02.1995

Gizem Süngü is following 0 account(s) and has 2 follower(s)

The followers of Gizem Süngü are: Sibel Gülmez, Gökhan Kaya,

Gizem Süngü is following:

Gizem Süngü has 2 posts

Step 28...

Liking a post of Gizem Süngü...

Step 29...

Logging out from account 'Sibel Gülmez'.

Step 30...

Logging into an account (username: Gökhan Kaya).

Step 31...

...Viewing Gizem Süngü's profile...

-----

User ID: 0

Username: Gizem Süngü

Location: Izmir

Birth Date: 01.02.1995

Gizem Süngü is following 0 account(s) and has 2 follower(s)

The followers of Gizem Süngü are: Sibel Gülmez, Gökhan Kaya,

Gizem Süngü is following:

Gizem Süngü has 2 posts

Step 32...

Adding a comment on a post of Gizem Süngü : Nice!...

Step 33...

Sending a message to Gizem Süngü...: Hello!

```

Step 34...
Logging out from account 'Gökhan Kaya'.

Step 35...
Logging into an account (username: Gizem Süngü).

Step 36...

...Viewing Gizem Süngü's profile...
-----
User ID: 0
Username: Gizem Süngü
Location: Izmir
Birth Date: 01.02.1995
Gizem Süngü is following 0 account(s) and has 2 follower(s)
The followers of Gizem Süngü are: Sibel Gülmez, Gökhan Kaya,
Gizem Süngü is following:
Gizem Süngü has 2 posts

Step 37...
...Viewing inbox...
-----
Message ID: 0
From: Gökhan Kaya
To: Gizem Süngü
Message: This homework is too easy
-----
Message ID: 1
From: Gökhan Kaya
To: Gizem Süngü
Message: Hello!

Step 38...An attempt will be made to view the profile from the sibel account that is not logged in.
To do this, you must first log into Sibel Gülmez account.pentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1$ [

```

**Output of :**

```

java arraylist_pkg.TestClass3
java LinkedList_pkg.TestClass3
java LDLinkedList_pkg.TestClass3

```

Step 1...Creating accounts...

An account with username Gizem Süngü has been created.

An account with username Sibel Gülmez has been created.

An account with username Gökhan Kaya has been created.

Step 2...

Logging into an account (username: Sibel Gülmez).

Step 3... Sharing two posts...

The post has been shared: I like Java.

The post has been shared: Java is better than coffee

Step 4...Following gizemsungu and gokhankaya...

You are following Gizem Süngü

You are following Gökhan Kaya

Step 5...

Logging out from account 'Sibel Gülmez'.

Step 6...

Logging into an account (username: Gökhan Kaya).

Step 7...

...Viewing Sibel Gülmez's profile...

-----

User ID: 1

Username: Sibel Gülmez

Location: Gebze

Birth Date: 07.05.1996

Sibel Gülmez is following 2 account(s) and has 0 follower(s)

The followers of Sibel Gülmez are:

Sibel Gülmez is following: Gizem Süngü, Gökhan Kaya,

Sibel Gülmez has 2 posts

Step 8...

...Viewing Sibel Gülmez 's posts...

(PostID: 0) Sibel Gülmez: I like Java.

(PostID: 1) Sibel Gülmez: Java is better than coffee

Step 9...

Liking a post of Sibel Gülmez...

Step 10...  
Adding a comment on a post of Sibel Gülmez : me too!...  
Adding a comment on a post of Sibel Gülmez : Absolutely I agree...

Step 11...  
You are following Sibel Gülmez  
You are following Gizem Süngü

Step 12...  
Sending a message to Gizem Süngü...: This homework is too easy

Step 13...  
Logging out from account 'Gökhan Kaya'.

Step 14...  
Logging into an account (username: Gizem Süngü).

Step 15...Checking outbox...  
There is/are 0 message(s) in the outbox.

Step 16...Checking inbox...  
There is/are 1 message(s) in the inbox.

Step 17...  
...Viewing inbox...  
-----  
Message ID: 0  
From: Gökhan Kaya  
To: Gizem Süngü  
Message: This homework is too easy

Step 18...  
...Viewing Sibel Gülmez's profile...  
-----  
User ID: 1  
Username: Sibel Gülmez  
Location: Gebze  
Birth Date: 07.05.1996  
Sibel Gülmez is following 2 account(s) and has 1 follower(s)  
The followers of Sibel Gülmez are: Gökhan Kaya,  
Sibel Gülmez is following: Gizem Süngü, Gökhan Kaya,  
Sibel Gülmez has 2 posts

```
Step 19...
...Viewing Sibel Gülmez 's posts...
(PostID: 0) Sibel Gülmez: I like Java.
(PostID: 1) Sibel Gülmez: Java is better than coffee
```

```
Step 20...
Viewing Sibel Gülmez's posts' interactions...
-----
(Post Id: 0) : I like Java.
The post was liked by the following account(s): Gökhan Kaya,
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'me too!'
-----
(Post Id: 1) : Java is better than coffee
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'Absolutely I agree'
-----
```

```
Step 21...
Liking a post of Sibel Gülmez...
```

```
Step 22...
Viewing Sibel Gülmez's posts' interactions...
-----
(Post Id: 0) : I like Java.
The post was liked by the following account(s): Gökhan Kaya, Gizem Süngü,
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'me too!'
-----
(Post Id: 1) : Java is better than coffee
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Gökhan Kaya' said 'Absolutely I agree'
-----
```

```
Step 23...
You blocked: Sibel Gülmez
```

```
Step 24...
Logging out from account 'Gizem Süngü'.
```

```
Step 25...
Logging into an account (username: Sibel Gülmez).
```

```
Step 26...tries to view the profile of 'gizemsungu'.
You cannot do this. This account has blocked you
```

```
Step 27...tries to send a message to 'gizemsungu'.
You cannot do this. This account has blocked youpentagon@Pentagon:~/Desktop/UNI/2. sene/CSE 222-DATA/homeworks/hw1$
```

## Output of :

java arraylist\_pkg.TestClass4

java LinkedList\_pkg.TestClass4

java LDLinkedList\_pkg.TestClass4

```
Step 1...Creating accounts...
An account with username Adam Smith has been created.
An account with username Marco Polo has been created.
An account with username Ibn Battuta has been created.
An account with username Evliya Çelebi has been created.
An account with username Le Fontaine has been created.
An account with username Elon Musk has been created.
An account with username Henry Ford has been created.
An account with username Robinson Crusoe has been created.
An account with username Sherlock Holmes has been created.
An account with username Anaksimandros has been created.

Step 2...
Logging into an account (username: Marco Polo).

Step 3...
The post has been shared: There are unicorns in China
The post has been shared: I didn't even tell half of what I saw because no one would believe me
The post has been shared: We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
The post has been shared: Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.

Step 4...
You are following Evliya Çelebi
Logging out from account 'Marco Polo'.

Step 5...
Logging into an account (username: Evliya Çelebi).

Step 6...
Adding a comment on a post of Marco Polo : There's worse than this. One day, while I was in Bulgaria, while I was resting at night, a woman entered the place where I was resting and the woman, who was me
ssy, started to say something in a different language. After some time passed, 7 children gathered around the woman. After performing some kind of ritual, the children turned into chickens....

Step 7...
Liking a post of Marco Polo...

Step 8...
Liking a post of Marco Polo...

Step 9...Actions of Evliya Çelebi account
You commented Marco Polo 's post. Post ID: 3
You liked Marco Polo's post. ID: 0
You liked Marco Polo's post. ID: 1

Step 10...
You are following Anaksimandros
You are following Marco Polo
You are following Elon Musk
You are following Adam Smith

...Viewing Evliya Çelebi's profile...
-----
User ID: 3
Username: Evliya Çelebi
```

```
Location: Unkapani
Birth Date: 01.02.1995
Evliya Çelebi is following 4 account(s) and has 1 follower(s)
The followers of Evliya Çelebi are: Marco Polo,
Evliya Çelebi is following: Anaksimandros, Marco Polo, Elon Musk, Adam Smith,
Evliya Çelebi has 0 posts

Step 11...
Adding a comment on a post of Marco Polo : You're probably talking about rhinos, man...

Step 12...
Adding a comment on a post of Marco Polo : Yes that's true because I'm also the emperor of Japan, I witnessed it...
Adding a comment on a post of Marco Polo : You didn't even go east of Urumqi...
Adding a comment on a post of Marco Polo : That's enough bullshit, I'm unfollowing you....

Step 13...
You unfollowed Marco Polo
You unfollowed Anaksimandros

...Viewing Evliya Çelebi's profile...
-----
User ID: 3
Usernames: Evliya Çelebi
Location: Unkapani
Birth Date: 01.02.1995
Evliya Çelebi is following 2 account(s) and has 1 follower(s)
The followers of Evliya Çelebi are: Marco Polo,
Evliya Çelebi is following: Elon Musk, Adam Smith,
Evliya Çelebi has 0 posts

Step 14...
Viewing Marco Polo's posts' interactions...
-----
(Post Id: 0) : There are unicorns in China
The post was liked by the following account(s): Evliya Çelebi,
The post has 1 comment(s)...
Comment 1: 'Evliya Çelebi' said 'You're probably talking about rhinos, man'
-----
(Post Id: 1) : I didn't even tell half of what I saw because no one would believe me
The post was liked by the following account(s): Evliya Çelebi,
The post has no comment. Make the first comment
-----
(Post Id: 2) : We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
The post has no like. Be the first to like
The post has 3 comment(s)...
Comment 1: 'Evliya Çelebi' said 'Yes that's true because I'm also the emperor of Japan, I witnessed it'
Comment 2: 'Evliya Çelebi' said 'You didn't even go east of Urumqi'
Comment 3: 'Evliya Çelebi' said 'That's enough bullshit, I'm unfollowing you.'
-----
(Post Id: 3) : Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.
The post has no like. Be the first to like
The post has 1 comment(s)...
```

```
Comment 1: 'Evliya Çelebi' said 'There's worse than this. One day, while I was in Bulgaria, while I was resting at night, a woman entered the place where I was resting and the woman, who was messy, started to say something in a different language. After some time passed, 7 children gathered around the woman. After performing some kind of ritual, the children turned into chickens.'
-----
Step 15...
Unliking a post of Marco Polo...

Step 16...
The comment on the post of Marco Polo is being deleted.

Step 17...Actions of Evliya Çelebi account
You commented Marco Polo 's post. Post ID: 3
You liked Marco Polo's post. ID: 0
You liked Marco Polo's post. ID: 1
You followed: Anaksimandros
You followed: Marco Polo
You followed: Elon Musk
You followed: Adam Smith
You commented Marco Polo 's post. Post ID: 0
You commented Marco Polo 's post. Post ID: 2
You commented Marco Polo 's post. Post ID: 2
You commented Marco Polo 's post. Post ID: 2
You unfollowed: Marco Polo
You unfollowed: Anaksimandros
You unliked the post of the account with ID. Post ID: 0. Post content: There are unicorns in China
You uncommented the post of the account with ID. Post ID: 2. Post content: We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick. Your deleted comment: That's enough bullshit, I'm unfollowing you.

Step 18...
Logging out from account 'Evliya Çelebi'.

Step 19...
Logging into an account (username: Marco Polo).

Step 20...
Viewing Marco Polo's posts' interactions...
-----
(Post ID: 0) : There are unicorns in China
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Evliya Çelebi' said 'You're probably talking about rhinos, man'
-----
(Post ID: 1) : I didn't even tell half of what I saw because no one would believe me
The post was liked by the following account(s): Evliya Çelebi,
The post has no comment. Make the first comment
-----
(Post ID: 2) : We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
The post has no like. Be the first to like
The post has 2 comment(s)...
Comment 1: 'Evliya Çelebi' said 'Yes that's true because I'm also the emperor of Japan, I witnessed it'
Comment 2: 'Evliya Çelebi' said 'That's enough bullshit, I'm unfollowing you.'
```

```
-----
(Post ID: 3) : Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Evliya Çelebi' said 'There's worse than this. One day, while I was in Bulgaria, while I was resting at night, a woman entered the place where I was resting and the woman, who was messy, started to say something in a different language. After some time passed, 7 children gathered around the woman. After performing some kind of ritual, the children turned into chickens.'
-----
Step 21...
The post has been shared: 0 awliya celebi! If you unfollow me, I will block you too. Why did you delete your comment? Because you know I went east of Urumqi

Step 22...
You blocked: Evliya Çelebi
You unfollowed Evliya Çelebi

Step 23...
You are following La Fontaine
You are following Henry Ford
You are following Ibn Battuta

Step 24...Actions of Marco Polo account
You shared a post: There are unicorns in China
You shared a post: I didn't even tell half of what I saw because no one would believe me
You shared a post: We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
You shared a post: Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.
You followed: Evliya Çelebi
You shared a post: 0 awliya celebi! If you unfollow me, I will block you too. Why did you delete your comment? Because you know I went east of Urumqi
You unfollowed: Evliya Çelebi
You blocked Evliya Çelebi
You followed: La Fontaine
You followed: Henry Ford
You followed: Ibn Battuta

Step 25...
Logging out from account 'Marco Polo'.

Step 27...
Logging into an account (username: Adam Smith).

Step 28...
You are following Robinson Crusoe
You are following Sherlock Holmes
You are following Evliya Çelebi

Step 29...
...Viewing Marco Polo 's posts...
(PostID: 0) Marco Polo: There are unicorns in China
(PostID: 1) Marco Polo: I didn't even tell half of what I saw because no one would believe me
(PostID: 2) Marco Polo: We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
(PostID: 3) Marco Polo: Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.
(PostID: 4) Marco Polo: 0 awliya celebi! If you unfollow me, I will block you too. Why did you delete your comment? Because you know I went east of Urumqi

Step 30...
Adding a comment on a post of Marco Polo : These behaviors is not becoming of grown men like you...
```



```
Step 31...
Sending a message to Evliya Çelebi...: Hey bro, you have blocked by Marko Polo! Marko Polo seems to be upset with you.

Step 32...
Logging out from account 'Adam Smith'.

Step 33...
Logging into an account (username: Evliya Çelebi).

Step 34...
...Viewing inbox...
-----
Message ID: 0
From: Adam Smith
To: Evliya Çelebi
Message: Hey bro, you have blocked by Marko Polo! Marko Polo seems to be upset with you.

Step 35...Evliya Çelebi is trying to view Marco Polo's profile...
You cannot do this. This account has blocked you

Step 36...Evliya Çelebi is trying to view Marco Polo's interactions...
You cannot do this. This account has blocked you

Step 37...
Sending a message to Adam Smith...: I think you're right. My words must have been a bit harsh. I was just messing around.

Step 38...
Logging out from account 'Evliya Çelebi'.

Step 39...
Logging into an account (username: Marco Polo).

Step 40...
Viewing Marco Polo's posts' interactions...
-----
(Post Id: 0) : There are unicorns in China
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Evliya Çelebi' said 'You're probably talking about rhinos, man'
-----
(Post Id: 1) : I didn't even tell half of what I saw because no one would believe me
The post was liked by the following account(s): Evliya Çelebi,
The post has no comment. Make the first comment
-----
(Post Id: 2) : We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
The post has no like. Be the first to like
The post has 2 comment(s)...
Comment 1: 'Evliya Çelebi' said 'Yes that's true because I'm also the emperor of Japan, I witnessed it'
Comment 2: 'Evliya Çelebi' said 'That's enough bullshit, I'm unfollowing you.'
-----
(Post Id: 3) : Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.
The post has no like. Be the first to like
The post has 1 comment(s)...
```

```
Comment 1: 'Evliya Çelebi' said 'There's worse than this. One day, while I was in Bulgaria, while I was resting at night, a woman entered the place where I was resting and the woman, who was messy, started to say something in a different language. After some time passed, 7 children gathered around the woman. After performing some kind of ritual, the children turned into chickens.'
```

```
-----
(Post Id: 4) : O awliya celebi! If you unfollow me, I will block you too. Why did you delete your comment? Because you know I went east of Urumqi
The post has no like. Be the first to like
The post has 1 comment(s)...
Comment 1: 'Adam Smith' said 'These behaviors is not becoming of grown men like you'
-----

Step 41...
You are unblocking Evliya Çelebi account

Step 42...Marko Polo is trying to message Evliya Çelebi without following him. However, by blocking him, he also ended up unfollowing him...
You must follow that account to send message!

Step 43...
You are following Evliya Çelebi

Step 44...
Sending a message to Evliya Çelebi...: I got angry all of a sudden and couldn't resist blocking you when you unfollowed me. I'm sorry about that

Step 45...Actions of Marco Polo account
You shared a post: There are unicorns in China
You shared a post: I didn't even tell half of what I saw because no one would believe me
You shared a post: We are like buddy with the Mongol emperor Kublai Khan, close enough to use the same toothpick
You shared a post: Spirits roam in the Gobi Desert, friends, if you want to go, don't go without consulting the locals.
You followed: Evliya Çelebi
You shared a post: O awliya celebi! If you unfollow me, I will block you too. Why did you delete your comment? Because you know I went east of Urumqi
You unfollowed: Evliya Çelebi
You blocked Evliya Çelebi
You followed: La Fontaine
You followed: Henry Ford
You followed: Ibn Battuta
You unblocked Evliya Çelebi
You followed: Evliya Çelebi
You sent message to: Evliya Çelebi

Step 46...
Logging out from account 'Marco Polo'.

Step 47...
Logging into an account (username: Evliya Çelebi).
```

Step 48...

...Viewing Marco Polo's profile...

-----

User ID: 1

Username: Marco Polo

Location: Venice

Birth Date: 01.02.1995

Marco Polo is following 4 account(s) and has 0 follower(s)

The followers of Marco Polo are:

Marco Polo is following: La Fontaine, Henry Ford, İbn Battuta, Evliya Çelebi,

Marco Polo has 5 posts