

GTU  
Department of Computer Engineering  
CSE 222 - Homework 3 Report

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## Running Command And Results

Operating System: *Ubuntu 22.04.2 LTS*

Java Version: *11.0.18*

### 1.1 Basic Array Structure (HW1)

#### 1.1.1 Test Case 1

```
dogukan@dogukan-vm:~/Desktop/BasicArray/homework1$ javac *.java
dogukan@dogukan-vm:~/Desktop/BasicArray/homework1$ cd ..
dogukan@dogukan-vm:~/Desktop/BasicArray$ java homework1.TestClass1
An account with username gizemsungu has been created.
An account with username sibelgulmez has been created.
An account with username gokhankaya has been created.

Logging into an account (username: sibelgulmez)
Sharing posts...
Sharing posts...
'sibelgulmez' Following gizemsungu
'sibelgulmez' Following gokhankaya
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 0 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...
Liking a post
gokhankaya Comments Post ID:1
'gokhankaya' Following sibelgulmez
'gokhankaya' Following gizemsungu
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)
Checking outbox...
There is/are 0 message(s) in the outbox.

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

1

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

```
Viewing inbox...
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!
```

```
Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995
```

```
sibelgulmez is following 2 account(s) and has 1 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.
```

```
Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...
```

```
Viewing sibelgulmez's posts' interactions...
```

```
-----
(PostID: 1): I like Java.
```

```
The post has 1 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...
```

```
The post has 0 like(s)...
The post has 0 comment(s)...
Liking a post
Liking a post
```

2

```
The post has 0 like(s)...
The post has 0 comment(s)...
Liking a post
Liking a post

Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...
dogukan@dogukan-vm:~/Desktop/BasicArray$
```

3

### 1.1.2 Test Case 2

*The first part was not added again because it is the same as Test 1..*

<pre>(PostID: 2): Java the coffee...  The post has 1 like(s)... The post was liked by the following account(s): gizemsungu , The post has 0 comment(s)...  -----Test SCENARIO 2----- *****  You're already logged in!! Username: gizemsungu Sharing posts... Sharing posts... Logging out from account (username: gizemsungu)  Logging into an account (username: sibelgulmez)  Viewing gizemsungu profile User ID: 1 Username: gizemsungu Location: Istanbul Birth Date: 13.01.1993  gizemsungu is following 0 account(s) and has 2 follower(s). gizemsungu is following: gizemsungu has 2 posts.  Liking a post Logging out from account (username: sibelgulmez)  Logging into an account (username: gokhankaya)  Viewing gizemsungu profile User ID: 1 Username: gizemsungu Location: Istanbul Birth Date: 13.01.1993  gizemsungu is following 0 account(s) and has 2 follower(s). gizemsungu is following: gizemsungu has 2 posts.</pre>	<pre>gizemsungu is following 0 account(s) and has 2 follower(s). gizemsungu is following: gizemsungu has 2 posts.  gokhankaya Comments Post ID:2 Sending a message to gizemsungu Logging out from account (username: gokhankaya)  Logging into an account (username: gizemsungu)  Viewing gizemsungu profile User ID: 1 Username: gizemsungu Location: Istanbul Birth Date: 13.01.1993  gizemsungu is following 0 account(s) and has 2 follower(s). gizemsungu is following: gizemsungu has 2 posts.  Viewing inbox... Message ID: 1 From: gokhankaya To: gizemsungu Message: This homework is too easy!  Message ID: 2 From: gokhankaya To: gizemsungu Message: Hello!  dogukan@dogukan-vm:~/Desktop/BasicArray\$</pre>
<b>1</b>	<b>2</b>

### 1.1.3 Test Case 3

```
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 3-----
*****

You're already logged in!! Username: gizemsungu
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages
dogukan@dogukan-vm:~/Desktop/BasicArray$
```

**1**

## 1.2 Array List Structure

### 1.2.1 Test Case 1

```
dogukan@dogukan-vm:~/Desktop/ArrayList/homework2v1$ javac *.java
dogukan@dogukan-vm:~/Desktop/ArrayList/homework2v1$ cd ..
dogukan@dogukan-vm:~/Desktop/ArrayList$ java homework2v1.TestClass1
An account with username gizemsungu has been created.
An account with username sibelgulmez has been created.
An account with username gokhankaya has been created.

Logging into an account (username: sibelgulmez)
Sharing posts...
Sharing posts...
'sibelgulmez' Following gizemsungu
'sibelgulmez' Following gokhankaya
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 0 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...
Liking a post
gokhankaya Comments Post ID:1
'gokhankaya' Following sibelgulmez
'gokhankaya' Following gizemsungu
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)
Checking outbox...
There is/are 0 message(s) in the outbox.

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

1

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

Viewing inbox...
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 1 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...

Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 1 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 0 like(s)...
The post has 0 comment(s)...
Liking a post
Liking a post

Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 2 like(s)...
```

2

```
Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...
dogukan@dogukan-vm:~/Desktop/ArrayList$
```

3

### 1.2.2 Test Case 2

*The first part was not added again because it is the same as Test case 1..*

```
The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 2-----
*****

You're already logged in!! Username: gizemsungu
Sharing posts...
Sharing posts...
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

Liking a post
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

gokhankaya Comments Post ID:2
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

Viewing inbox...
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!

Message ID: 2
From: gokhankaya
To: gizemsungu
Message: Hello!

dogukan@dogukan-vm:~/Desktop/ArrayList$
```

1

2

### 1.2.3 Test Case 3

```
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 3-----
*****

You're already logged in!! Username: gizemsungu
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages

dogukan@dogukan-vm:~/Desktop/ArrayList$
```

1

## 1.2.4 Test Case 4

*The first part was not added again because it is the same as Test case 1..*

```
The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 4-----
*****

Unlike a post

Viewing sibelgulmez's posts' interactions...

-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 0 like(s)...
The post has 0 comment(s)...
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages
Logging out from account (username: sibelgulmez)

Logging into an account (username: gizemsungu)
gizemsungu unblocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 0 posts.
```

1

```
gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 0 posts.

Logging out from account (username: sibelgulmez)

Logging into an account (username: dogukantastan)
'dogukantastan' Following temeltastan
'dogukantastan' Following sibelgulmez
'dogukantastan' Following gizemsungu
'dogukantastan' Following mustafayilmaz
'dogukantastan' Following emreyilmaz

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 5 account(s) and has 0 follower(s).
dogukantastan is following: temeltastan ,sibelgulmez ,gizemsungu ,mustafayilmaz ,emreyilmaz
dogukantastan has 0 posts.

dogukantastan Unfollow temeltastan

Must first follow for this operation !!
Must first follow for this operation !!
Must first follow for this operation !!

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 4 account(s) and has 0 follower(s).
dogukantastan is following: sibelgulmez ,gizemsungu ,mustafayilmaz ,emreyilmaz ,
dogukantastan has 0 posts.

Must first follow for this operation !!
Must first follow for this operation !!
dogukantastan Unfollow mustafayilmaz

Must first follow for this operation !!
dogukantastan Unfollow gizemsungu
```

2

```
Must first follow for this operation !!
dogukantastan Unfollow mustafayilmaz

Must first follow for this operation !!
dogukantastan Unfollow gizemsungu

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 2 account(s) and has 0 follower(s).
dogukantastan is following: sibelgulmez ,emreyilmaz ,
dogukantastan has 0 posts.

Logging out from account (username: dogukantastan)

Logging into an account (username: ahmetyilmaz)
Sharing posts...

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 0 comment(s)...
dogukantastan Comments Post ID:3
gizemsungu Comments Post ID:3

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
```

3

```
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 2 comment(s)...
Comment 1'dogukantastan'said 'me too !'
Comment 2'gizemsungu'said 'Hello !'
gizemsungu Uncomment Post: 3

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 1 comment(s)...
Comment 1'dogukantastan'said 'me too !'
..... gizemsungu History .....
Liking a post: 1
Liking a post: 2
Unlike a post: 2
gizemsungu Comments Post ID:3
gizemsungu Uncomment Post: 3

dogukan@dogukan-vm:~/Desktop/Homework3/ArrayList$
```

4

## 1.3 Linked List Structure

### 1.3.1 Test Case 1

```
dogukan@dogukan-vm:~/Desktop/LinkedList/homework2v2$ javac *.java
dogukan@dogukan-vm:~/Desktop/LinkedList/homework2v2$ cd ..
dogukan@dogukan-vm:~/Desktop/LinkedList$ java homework2v2.TestClass1
An account with username gizemsungu has been created.
An account with username sibelgulmez has been created.
An account with username gokhankaya has been created.

Logging into an account (username: sibelgulmez)
Sharing posts...
Sharing posts...
'sibelgulmez' Following gizemsungu
'sibelgulmez' Following gokhankaya
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 0 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...
Liking a post
gokhankaya Comments Post ID:1
'gokhankaya' Following sibelgulmez
'gokhankaya' Following gizemsungu
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)
Checking outbox...
There is/are 0 message(s) in the outbox.

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

Viewing inbox...
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 1 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...
Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 1 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 0 like(s)...
The post has 0 comment(s)...
Liking a post
Liking a post

Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----

The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...
dogukan@dogukan-vm:~/Desktop/LinkedList$
```



### 1.3.2 Test Case 2

*The first part was not added again because it is the same as Test case 1..*

```
-----Test SCENARIO 2-----
*****

You're already logged in!! Username: gizemsungu
Sharing posts...
Sharing posts...
Logging out from account (username: gizemsungu)
Logging into an account (username: sibelgulmez)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

Liking a post
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

gokhankaya Comments Post ID:2
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

Viewing inbox...
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!

Message ID: 2
From: gokhankaya
To: gizemsungu
Message: Hello!

dogukan@dogukan-vm:~/Desktop/LinkedList$
```

### 1.3.3 Test Case 3

*The first part was not added again because it is the same as Test case 1..*

```
The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 3-----
*****

You're already logged in!! Username: gizemsungu
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages
dogukan@dogukan-vm:~/Desktop/LinkedList$
```



### 1.3.4 Test Case 4

*The first part was not added again because it is the same as Test case 1..*

```
The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 4-----
*****

Unlike a post

Viewing sibelgulmez's posts' interactions...

-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 0 like(s)...
The post has 0 comment(s)...
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages
Logging out from account (username: sibelgulmez)

Logging into an account (username: gizemsungu)
Must first follow for this operation !!
gizemsungu unblocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
```

1

```
gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 0 posts.

Logging out from account (username: sibelgulmez)

Logging into an account (username: dogukantastan)
'dogukantastan' Following temeltastan
'dogukantastan' Following sibelgulmez
'dogukantastan' Following gizemsungu
'dogukantastan' Following mustafayilmaz
'dogukantastan' Following emreyilmaz

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 5 account(s) and has 0 follower(s).
dogukantastan is following: temeltastan ,sibelgulmez ,gizemsungu ,mustafayilmaz ,emreyilmaz
dogukantastan has 0 posts.

dogukantastan Unfollow temeltastan

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 4 account(s) and has 0 follower(s).
dogukantastan is following: sibelgulmez ,gizemsungu ,mustafayilmaz ,emreyilmaz ,
dogukantastan has 0 posts.

dogukantastan Unfollow mustafayilmaz

dogukantastan Unfollow gizemsungu

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000
```

2

```
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 2 account(s) and has 0 follower(s).
dogukantastan is following: sibelgulmez ,emreyilmaz ,
dogukantastan has 0 posts.

Logging out from account (username: dogukantastan)

Logging into an account (username: ahmetyilmaz)
Sharing posts...

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 0 comment(s)...
dogukantastan Comments Post ID:3
gizemsungu Comments Post ID:3

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
```

3

```
Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 2 comment(s)...
Comment 1'dogukantastan'said 'me too !'
Comment 2'gizemsungu'said 'Hello !'
gizemsungu Uncomment Post: 3

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 1 comment(s)...
Comment 1'dogukantastan'said 'me too !'
..... gizemsungu History .....
Liking a post: 1
Unlike a post: 2
gizemsungu Comments Post ID:3
gizemsungu Uncomment Post: 3

real    0m0,263s
user    0m0,439s
sys     0m0,124s
dogukan@dogukan-vm: ~/Desktop/Homework3/LinkedList$
```

4

## 1.4 LD Linked List

### 1.4.1 Test Case 1

```
dogukan@dogukan-vm:~/Desktop/LDLinked List/homework2v3$ javac *.java
dogukan@dogukan-vm:~/Desktop/LDLinked List/homework2v3$ cd ..
dogukan@dogukan-vm:~/Desktop/LDLinked List$ java homework2v3.TestClass1
An account with username gizemsungu has been created.
An account with username sibelgulmez has been created.
An account with username gokhankaya has been created.

Logging into an account (username: sibelgulmez)
Sharing posts...
Sharing posts...
'sibelgulmez' Following gizemsungu
'sibelgulmez' Following gokhankaya
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)
View Profile: sibelgulmez

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 0 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...
Liking a post
gokhankaya Comments Post ID:1
'gokhankaya' Following sibelgulmez
'gokhankaya' Following gizemsungu
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)
Checking outbox...
There is/are 0 message(s) in the outbox.

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

Viewing inbox...
Message ID: 1
From: gokhankaya
```

1

```
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!

View Profile: sibelgulmez

Viewing sibelgulmez profile
User ID: 2
Username: sibelgulmez
Location: Istanbul
Birth Date: 10.03.1995

sibelgulmez is following 2 account(s) and has 1 follower(s).
sibelgulmez is following: gizemsungu ,gokhankaya ,
sibelgulmez has 2 posts.

Viewing sibelgulmez' posts..
(PostID: 1) sibelgulmez: I like Java.
(PostID: 2) sibelgulmez: Java the coffee...

Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 1 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 0 like(s)...
The post has 0 comment(s)...
Liking a post
Liking a post

Viewing sibelgulmez's posts' interactions...
-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
```

2

```
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...
```

3

```
dogukan@dogukan-vm:~/Desktop/LDLinked List$
```

#### 1.4.2 Test Case 2

*The first part was not added again because it is the same as Test case 1..*

```
-----Test SCENARIO 2-----
*****

You're already logged in!! Username: gizemsungu
Sharing posts...
Sharing posts...
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
View Profile: gizemsungu

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

Liking a post
Logging out from account (username: sibelgulmez)

Logging into an account (username: gokhankaya)
View Profile: gizemsungu

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

gokhankaya Comments Post ID:2
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)
View Profile: gizemsungu

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

gokhankaya Comments Post ID:2
Sending a message to gizemsungu
Logging out from account (username: gokhankaya)

Logging into an account (username: gizemsungu)
View Profile: gizemsungu

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 2 posts.

Viewing inbox...
Message ID: 1
From: gokhankaya
To: gizemsungu
Message: This homework is too easy!

Message ID: 2
From: gokhankaya
To: gizemsungu
Message: Hello!

dogukan@dogukan-vm:~/Desktop/LDLinked List$
```

#### 1.4.3 Test Case 3

*The first part was not added again because it is the same as Test case 1..*

```
The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 3-----
*****

You're already logged in!! Username: gizemsungu
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
View Profile: gizemsungu
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages

dogukan@dogukan-vm:~/Desktop/LDLinked List$
```

#### 1.4.4 Test Case 4

*The first part was not added again because it is the same as Test case 1..*

```
The post has 1 like(s)...
The post was liked by the following account(s): gizemsungu ,
The post has 0 comment(s)...

-----Test SCENARIO 4-----
*****

Unlike a post

Viewing sibelgulmez's posts' interactions...

-----
(PostID: 1): I like Java.

The post has 2 like(s)...
The post was liked by the following account(s): gokhankaya ,
The post was liked by the following account(s): gizemsungu ,
The post has 1 comment(s)...
Comment 1'gokhankaya'said 'me too!'
-----
(PostID: 2): Java the coffee...

The post has 1 like(s)...
The post has 0 comment(s)...
gizemsungu blocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
View Profile: gizemsungu
This user has blocked you ! Cannot View Profile
This user has blocked you ! Cannot send messages
Logging out from account (username: sibelgulmez)

Logging into an account (username: gizemsungu)
Must first follow for this operation !!
gizemsungu unblocked user: sibelgulmez
Logging out from account (username: gizemsungu)

Logging into an account (username: sibelgulmez)
View Profile: gizemsungu

Viewing gizemsungu profile
User ID: 1
Username: gizemsungu
Location: Istanbul
Birth Date: 13.01.1993
```

1

```
Location: Istanbul
Birth Date: 13.01.1993

gizemsungu is following 0 account(s) and has 2 follower(s).
gizemsungu is following:
gizemsungu has 0 posts.

Logging out from account (username: sibelgulmez)

Logging into an account (username: dogukantastan)
'dogukantastan' Following temeltastan
'dogukantastan' Following sibelgulmez
'dogukantastan' Following gizemsungu
'dogukantastan' Following mustafayilmaz
'dogukantastan' Following emreyilmaz
View Profile: dogukantastan

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 5 account(s) and has 0 follower(s).
dogukantastan is following: temeltastan ,sibelgulmez ,gizemsungu ,mustafayilmaz ,emreyilmaz
dogukantastan has 0 posts.

dogukantastan Unfollow temeltastan

View Profile: dogukantastan

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 4 account(s) and has 0 follower(s).
dogukantastan is following: sibelgulmez ,gizemsungu ,mustafayilmaz ,emreyilmaz ,
dogukantastan has 0 posts.

dogukantastan Unfollow mustafayilmaz

dogukantastan Unfollow gizemsungu

View Profile: dogukantastan
```

2

```
View Profile: dogukantastan

Viewing dogukantastan profile
User ID: 4
Username: dogukantastan
Location: Kocaeli
Birth Date: 07.08.2000

dogukantastan is following 2 account(s) and has 0 follower(s).
dogukantastan is following: sibelgulmez ,emreyilmaz ,
dogukantastan has 0 posts.

Logging out from account (username: dogukantastan)

Logging into an account (username: ahmetyilmaz)
Sharing posts...
View Profile: ahmetyilmaz

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 0 comment(s)...
dogukantastan Comments Post ID:3
gizemsungu Comments Post ID:3
View Profile: ahmetyilmaz

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
```

3

```
ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.

Viewing ahmetyilmaz's posts' interactions...

-----
(PostID: 3): I like CSE 222.

The post has 0 like(s)...
The post has 2 comment(s)...
Comment 1'dogukantastan'said 'me too !'
Comment 2'gizemsungu'said 'Hello !'
gizemsungu Uncomment Post: 3

View Profile: ahmetyilmaz

Viewing ahmetyilmaz profile
User ID: 7
Username: ahmetyilmaz
Location: Mersin
Birth Date: 04.03.1965

ahmetyilmaz is following 0 account(s) and has 0 follower(s).
ahmetyilmaz is following:
ahmetyilmaz has 1 posts.
```

Viewing ahmetyilmaz's posts' interactions...4

-----
(PostID: 3): I like CSE 222.

```
The post has 0 like(s)...
The post has 2 comment(s)...
Comment 1'dogukantastan'said 'me too !'
..... gizemsunguHistory .....
View MessageBox
Liking a post: 1
Liking a post: 2
Unlike a post: 2
gizemsungu Comments Post ID:3
gizemsungu Uncomment Post: 3
```

dogukan@dogukan-vm:~/Desktop/Homework3/LDLinked List\$

## Time complexity analysis

Implementation Type	Follow	Unfollow	Like	Unlike	Comment	Uncomment	Share post	Login
Basic Array Structure	$O(1)$	-	$O(1)$	-	$O(1)$	-	$O(1)$	$O(n)$
Array List Structure	$O(n)$	$O(n^2)$	$O(n)$	$O(n^2)$	$O(n)$	$O(n^2)$	$O(n)$	$O(n)$
Linked List Structure	$O(1)$	$O(n^2)$	$O(1)$	$O(n^2)$	$O(1)$	$O(n^2)$	$O(1)$	$O(n^2)$
LD Linked List Structure	$O(1)$	$O(n^2)$	$O(1)$	$O(n^2)$	$O(1)$	$O(n^2)$	$O(1)$	$O(n^2)$

## Experimental running time analysis

Implementation Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Basic Array Structure (HW1)	0,404s	0,404s	0,411	Not available
Array List Structure (a)	0,405s	0,413s	0,415s	0,460s
Linked List Structure (b)	0,410s	0,411s	0,401s	0,457s
LD Linked List Structure (c)	0,406s	0,423s	0,434s	0,466s

Compilations were made as “ time java homework1.TestClass1 ” and each result was repeated 5 times and the average was taken.

## Problem solution approach for LDLinkedList

```
@Override
public E remove(int index) { // management function

    checkIndex(index);
    boolean flag=false;
    int oldIndex=0;

    Node<E> current = head;
    Node<E> current2 = head;

    while(current!= null) {
        if(current.isDeleted == true) {
            flag=true;
            break;
        }
        oldIndex++;
        current=current.next;
    }
    if(!flag) {
        for (int i = 0; i < index; i++)
            current2 = current2.next;
        current2.isDeleted=true;
    }
    if(flag) {
        if(oldIndex>index) {
            Myremove(oldIndex);
            Myremove(index);
        }
        else {
            Myremove(oldIndex);
            Myremove(index-1);
        }
    }
}
```

To implement the lazy deletion strategy, I designed the remove function as a management function. While the necessary checks and operations are done here, the actual deletion is done in the function named Myremove. When our Remove function is called, we first check whether a deletion has occurred before the current index with a while loop. If not, this item is only marked as isDeleted= True due to lazy deletion and the process ends. However, if an operation has been performed before, that is, if the true variable is found, we determine this with the help of the flag and send it to the My remove function to delete the oldIndex and the current index. Here there are conditions for the indexes not to be confused because when we delete a previous index, the index will change afterwards.

```
public E Myremove(int index) {

    checkIndex(index);
    E removedValue;

    Node<E> iter = head;

    if (head == tail) {
        removedValue=head.data;
        head = null;
        tail = null;
        size--;
        return removedValue;
    }
    else {
        if(index == 0) {
            removedValue=head.data;
            Node<E> oldhead = head;
            head=head.next;
            oldhead.next = null;
            size--;
            return removedValue;
        }
        if(index == size-1) {
            for (int i = 0; i < index - 1; i++) {
                iter = iter.next;
            }
            removedValue=iter.next.data;
            iter.next=null;
            tail=iter;
            size--;
            return removedValue;
        }
        else {
            for (int i = 0; i < index - 1; i++) {
                iter = iter.next;
            }
            removedValue=iter.next.data;
            Node<E> temp = iter.next;
            iter.next = iter.next.next;
            temp.next = null;
            size--;
            return removedValue;
        }
    }
}
```

Myremove function is the function where we do the actual deletion of our linkedlist. We said that the reason we use this function is to use the main remove function as a management function for lazy deletion. First of all, it checks if the list has a single element, if head==tail then the list is empty and it sets head and tail equal to null. Otherwise, if the element to be deleted is at the top, head is updated accordingly. head is first stored in the oldhead variable and head is now set to point next, then the next of oldhead is set to null. index == size-1 represents deletion from the end and similar operations to head are done for tail. in case of else, deletion is done from the middle of the list.



```

4 public boolean add(E element) {
5     Node<E> newNode= new Node<E>(element);

6     if (head == null) {
7         head = new Node<E>(element);
8         tail = head;
9         size++;
10        return true;
11    }

12    else {
13        tail.next = newNode;
14        tail = newNode;
15        size++;
16        return true;
17    }
18 }

```

In this version of the add function, it only adds to the end. The add leaf first checks if the list is empty, if head= null, it creates a new node object and shows it to head and tail. If not, tail.next shows the new node because it is added from the end and then tail itself shows the new node.

```

5 public class LDLinkedList<E> extends AbstractList<E> implements List<E> {
6
7     private Node<E> head;
8     private Node<E> tail;
9     private int size;
10    private int oldIndex=0;
11
12    public LDLinkedList() {
13
14        head = null;
15        tail = null;
16        size = 0;
17    }
18
19    @Override
20    public E get(int index) {
21
22        checkIndex(index);
23        Node<E> current = head;
24        for (int i = 0; i < index; i++) {
25            current = current.next;
26        }
27        return current.data;
28    }
29
30    public boolean getBool(int index) {
31        checkIndex(index);
32        Node<E> current = head;
33        for (int i = 0; i < index; i++) {
34            current = current.next;
35        }
36        return current.isDeleted;
37    }
38
39    private void checkIndex(int index) {
40        if (index < 0 || index >= size) {
41            throw new IndexOutOfBoundsException("Index: " + index + ", Size: " + size);
42        }
43    }
44
45    @Override
46    public int size() {
47
48        return size;
49    }
50 }

```

This is the general implementation of the LDLink class The getBool function returns the isDeleted value in the node, unlike the normal get function