

## MIDTERM ASSIGNMENT

**Subject :** Classes, objects, encapsulation, inheritance, and polymorphism.

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**Out Date:** 05/03/2021 23:59:59

**Due Date:** 05/17/2021 23:59:59

## DECLARATION OF HONOR CODE<sup>1</sup>

**Student ID** .....

**Name** .....

**Surname** .....

In the course of Introduction to Object Oriented Programming (CENG 1004), I take academic integrity very seriously and ask you to do as well. That's why, this page is dedicated to some clear statements that defines the policies of this assignment, and hence, will be in force. Before reading this assignment booklet, please first read the following rules to avoid any possible violation on academic integrity.

- This assignment must be done individually unless stated otherwise.
- You are encouraged to discuss with your classmates about the given assignments, but these discussions should be carried out in an abstract way. That is, you cannot copy code (in whole or in part) of someone else, cannot share your code (in whole or in part) with someone else either.
- The previous rule also holds for the material found on the web as everything on the web has been written by someone else.
- You must not look at solution sets or program code from other years.
- You cannot share or leave your code (in whole or in part) in publicly accessible areas.
- You have to be prepared to explain the idea behind the solution of this assignment you submit.
- Finally, you must make a copy of your solution of this assignment and keep it until the end of this semester.

*I have carefully read every of the statements regarding this assignment and also the related part of the official disciplinary regulations of Muğla Sıtkı Koçman University and the Council of Higher Education. By signing this document, I hereby declare that I shall abide by the rules of this assignment to prevent any violation on academic integrity.*

**Signature** .....

<sup>1</sup>This page should be filled and signed by your handwriting. Make it a cover page of your report.

## 1 Overview of the Application

In this assignment, you will develop your social media platform (what we will call it is *mysocialbook*) with very simplified use case scenarios. To complete every functionality of *mysocialbook*, please read each of the following lines with a high care.



## 2 Application's Specification

This and the following sections are dedicated to clearly review the requirements (or specification) of the system you are going to develop. The core components of the system will include:

- users (people having an account of *mysocialbook*),
- posts (textual or multimedia post shared by users).

You will be given two files separately: the one contains information necessary for creating the initial users for the system, while the other contains different commands to test various use case scenarios of your application.

These components are further explained in detail in the following sections.

### 2.1 Users

Users refers to the people who only use *mysocialbook* platform (i.e., they do not have any privilege such as admin, system manager, and the like). The properties and behaviors that user can have are listed below:

- Every User in the system has a unique **userID**, a **name**, a unique **username**, a **password**, a **date of birth**, information about **school from which the user graduated**, a last **log-in date**, a **collection of friends**, a **collection of blocked users**, and a **collection of posts**.
- **userIDs** should be assigned as integers **in order**, starting from 1 for the first user that is added to the system. These IDs **cannot be changed later**. A newly added user should **never get an ID that has been assigned before** to some other user, even in cases when other users get removed from the system.
- Users' dates of birth and last log-in dates should be stored as **Date** variables.
- Users must perform
  - Sign in,
  - Sign out,
  - Update their user profile info (name, date of birth, and school graduated),
  - Change their passwords,

- Add friends to their friend lists,
  - Remove friends from their friend lists,
  - Add posts,
  - Remove posts,
  - Block users,
  - Unblock users,
  - List their friends,
  - List all users,
  - List blocked friends,
  - List blocked users.
- It is a **must** for any user **to be logged-in** in order for her/him to perform **any of these actions** other than **sign in**.
  - You are required to hide sensitive personal user info and implement setter and getter methods as necessary.
  - *mysocialbook* platform should begin execution by reading a tab-separated file named `input.txt`. The user's data will be given as following format:

**name<TAB>username<TAB>password<TAB>dateofBirth<TAB>graduatedSchool**

An exemplar for the content of this file is shown below:

Ahmet	ahmet	ahmet123	04/25/2001	Meram Anadolu Lisesi
Demet	demet	demet00	01/16/1999	Ankara Fen Lisesi
Zeki	zeki	zeki01	08/16/1987	Kadıkoy Lisesi
Gizem	gizem	gizem1	12/09/1997	Hacettepe Üniversitesi
Utku	utku	utku99	10/06/1999	Bilkent Üniversitesi
Hakan	hakan	hakan81	03/01/1981	Mugla S.K. Üniversitesi

## 2.2 Posts

They can either be a textual or multimedia content shared by users. You are expected to design your post classes in a hierarchical structure. The necessary information about posts is as follows:

- Posts are categorized as either *text posts*, *image posts*, or *video posts*. But be careful: these posts have a **textual part in common**, and can optionally contain **image or video** (for image and video post categories, respectively!).
- *mysocialbook* should be designed such that **it is open for an integration of any new post type** (e.g., hypertext posts) that may or may not have a textual part.
- Every post category **must** contain a **location**, a collection of **tagged friends**, and a **date** when the post originated.

- Location should be implemented as a **separate class** with the following attributes: **latitude** and **longitude** (stored as **double** values).
- The **format to display** the post itself **can change with respect to the post type** of interest. So, in the case of inclusion a new post type to *mysocialbook*, designer **must** specify its printing format. You should enforce user who proposes a new post type to **implement display format** of that post.
- Text posts have a **text**.
- Image posts have the **image filename**, and the **image resolution** (width and height in pixels).
- Video posts have the **video filename**, **video duration**, and a **constant** attribute that specifies the **maximum video length in minutes** (the maximum allowed video duration is **10 minutes**).
- Note that you are required to implement setter and getter methods as necessary.

### 3 Testing Scenarios

- i. **Add New User:** The system should also be open for adding new users. The program should add a if the syntax of the command is as provided below:

**ADDUSER**<TAB>**name**<TAB>**userName**<TAB>**password**<TAB>**dateofBirth**<TAB>**schoolGraduated**

*Illustration of execution:*

ADDUSER	Adnan	adnan	adnan1	01/01/1991	Selcuk Universitesi
Adnan has been successfully added.					

- ii. **Remove Existing User:** The system should also remove an existing user It takes one parameter which indicates **userID**.

**REMOVEUSER**<TAB>**userID**

*Illustration of execution:*

REMOVEUSER	1
User has been successfully removed.	
No such user!	

- iii. **Show Posts:** The system should also be able to display users' posts. The parameter for this action is a **username**.

**SHOWPOSTS**<TAB>**userName**

*Illustration of execution:*

SHOWPOSTS    userName
adnan does not have any posts yet.
No such user!
***** adnan's Posts *****  1st text post Date: 14.04.2017 Location: 39.8833431, 32.7381663 ----- 1st text post Date: 14.04.2017 Location: 39.8833431, 32.7381663 Friends tagged in this post: ahmet, demet, adnan ----- 1st image post Date: 14.04.2017 Location: 42.8833431, 32.6381533 Friends tagged in this post: demet, gizem Image: image.png Image resolution: 135x250 ----- 1st video post Date: 14.04.2017 Location: 39.8833431, 32.6381533 Friends tagged in this post: utku Video: myvideo.avi Video duration: 8 minutes -----

- iv. **Sign-In:** This is the base action for users to perform before they are allowed to interact with the system and execute other commands. As in a real application, this evaluator takes two parameters that are a username and a password.

**SIGNIN**<TAB>userName<TAB>password

*Illustration of execution:*

SIGNIN    adnan    adnan1
You have successfully signed in.
Invalid username or password! Please try again.

- v. **Sign-Out:** It prevents the user from executing any scenarios other than sign-in. No argument needed to perform this command since it is assumed only one user can log in to the system at a particular time.

**SIGNOUT**

*Illustration of execution:*

SIGNOUT
You have successfully signed out.

- vi. **Update Profile:** User who has already logged in may change his/her personal information (name, date of birth, and school from which (s)he graduated). It takes three arguments and these are assumed to be the updated values.

**UPDATEPROFILE**<TAB>**name**<TAB>**dateofBirth**<TAB>**schoolGraduated**

*Illustration of execution:*

UPDATEPROFILE Adnan 07/01/1991 Mugla S.K. Üniversitesi
Your user profile has been successfully updated
Error: Please sign in and try again.

- vii. **Change Password:** A user may want to change his/her password. The system should first check if the provided password matches the current password.

**CHPASS**<TAB>**oldPassword**<TAB>**newPassword**

*Illustration of execution:*

CHPASS adnan1 adnan123
Password mismatch!
Error: Please sign in and try again.

- viii. **Add New Friend:** Friendship is the most important point in *mysocialbook* and without which probably it would not gain much attention. The system you will develop should allow a user who has signed in to add an existing user as a friend. It takes only one argument, which indicates user name of the user who will be added.

**ADDFRIEND**<TAB>**userName**

*Illustration of execution:*

ADDFRIEND ahmet
ahmet has been successfully added to your friend list.
This user is already in your friend list!
No such user!
Error: Please sign in and try again.

- ix. **Remove Friend:** A user can also remove a user from his/her friend list. This operator takes one argument that is a username.

**REMOVEFRIEND**<TAB>**userName**

*Illustration of execution:*

REMOVEFRIEND ahmet
ahmet has been successfully removed from your friend list.
No such friend!
Error: Please sign in and try again.

- x. **Add Text Post:** User can create a new text post by specifying the text content, location (longitude & latitude), and username of the friends who will be tagged to this post, each of the usernames is separated by column (:) mark.

**ADDPOST-TEXT**<TAB>**textContent**<TAB>**longitude**<TAB>**latitude**<TAB> **user-Name1**<:>**userName2**<:>..**user-NameN**

*Illustration of execution:*

ADDPOST-TEXT	1st text post	39.88	32.73	ahmet:demet:adnan
The post has been successfully added.				
ahmet is not your friend, and will not be tagged!				
The post has been successfully added.				
ahmet is not your friend, and will not be tagged!				
demet is not your friend, and will not be tagged!				
The post has been successfully added.				
Error: Please sign in and try again.				

- xi. **Add Image Post:** A user can also create an image or a video post. In this scenario, the image path and resolution information should be provided to the system as well.

**ADDPOST-IMAGE**<TAB>**textContent**<TAB>**longitude**<TAB>**latitude**<TAB> **user-Name1**<:>**userName2**<:>..**user-NameN**<TAB>**filePath**<TAB>**resolution**

*Illustration of execution:*

ADDPOST-IMAGE	1st image post	42.88	32.63	demet:gizem	img.png	135x250
The post has been successfully added.						
demet is not your friend, and will not be tagged!						
The post has been successfully added.						
demet is not your friend, and will not be tagged!						
gizem is not your friend, and will not be tagged!						
The post has been successfully added.						
Error: Please sign in and try again.						

- xii. **Add Video Post:** User should only provide the file path and duration of the video.

**ADDPOST-VIDEO**<TAB>**textContent**<TAB>**longitude**<TAB>**latitude**<TAB> **user-Name1**<:>**userName2**<:>..**user-NameN**<TAB>**filePath**<TAB>**videoDuration**

*Illustration of execution:*

ADDPOST-VIDEO	1st video post	39.88	32.63	utku:gizem	myvideo.avi	8
The post has been successfully added.						
gizem is not your friend, and will not be tagged!						
The post has been successfully added.						
utku is not your friend, and will not be tagged!						
gizem is not your friend, and will not be tagged!						
The post has been successfully added.						
Error: Your video exceeds maximum allowed duration of 10 minutes.						
Error: Please sign in and try again.						

- xiii. **Remove Post:** User is able to remove a post that has been created the latest.

#### REMOVELASTPOST

*Illustration of execution:*

REMOVELASTPOST
Your last post has been successfully removed.
Error: You do not have any post.
Error: Please sign in and try again.

- xiv. **Block User:** As in many of the real-world social platforms, a user may block another user due to several reasons (disturbing posts, etc.) in *mysocialbook* as well. Users can block any other user through her/his username as argument.

#### BLOCK<TAB>userName

*Illustration of execution:*

BLOCK    ahmet
ahmet has been successfully blocked.
No such user!
Error: Please sign in and try again.

- xv. **Unblock User:** The system should also allow a user to unblock another user who has been blocked by him/her.

#### UNBLOCK<TAB>userName

*Illustration of execution:*

UNBLOCK    ahmet
ahmet has been successfully unblocked.
No such user in your blocked-user list!
Error: Please sign in and try again.

- xvi. **List Friends:** Users should be able to lists their friends no matter they are blocked or not.

#### LISTFRIENDS

*Illustration of execution:*



LISTFRIENDS
You have not added any friend yet!
Error: Please sign in and try again.
Name: Adnan Username: adnan Date of Birth: 01/01/1991 School: Selcuk Universitesi <hr/> Name: Ahmet Username: ahmet Date of Birth: 04/25/2001 School: Meram Anadolu Lisesi <hr/>

- xvii. **List Users:** Users should be able to view all users in the system.

#### LISTUSERS

*Illustration of execution:*

LISTUSERS
Error: Please sign in and try again.
Name: Adnan Username: adnan Date of Birth: 01/01/1991 School: Selcuk Universitesi <hr/> Name: Ahmet Username: ahmet Date of Birth: 04/25/2001 School: Meram Anadolu Lisesi <hr/>

- xviii. **Show Blocked Friends:** Users should be able to lists their friends whom they have blocked.

#### SHOWBLOCKEDFRIENDS

*Illustration of execution:*

SHOWBLOCKEDFRIENDS
You haven't blocked any friend yet!
Error: Please sign in and try again.
Name: Adnan Username: adnan Date of Birth: 01/01/1991 School: Selcuk Universitesi <hr/>

- xix. **Show Blocked Users:** Similar to the previous scenario, users should be able to lists all users whom they have blocked including no-friendship.

**SHOWBLOCKEDUSERS***Illustration of execution:*

SHOWBLOCKEDUSERS
You haven't blocked any user yet!
Error: Please sign in and try again.
Name: Adnan Username: adnan Date of Birth: 01/01/1991 School: Selcuk Universitesi ----- Name: Ahmet Username: ahmet Date of Birth: 04/25/2001 School: Meram Anadolu Lisesi -----

**Input and File for Commands**

*mysocialbook* platform should read a tab-separated file named `commands.txt`. A detailed explanation, format and expected output for each command is given before.

An exemplar for the content of this file is shown below:

```
ADDUSER Adnan adnan adnan1 01/01/1991 Selcuk Universitesi
REMOVEUSER 1
SIGNIN cemil cemil1
SIGNIN adnan adnan1
LISTUSERS
UPDATEPROFILE Adnan 07/01/1991 Gazi University
CHPASS adnan123 adnan1234
CHPASS adnan1 adnan123
ADDFRIEND ahmet
ADDFRIEND demet
ADDFRIEND demet
ADDFRIEND gizem
ADDFRIEND utku
ADDFRIEND ziya
REMOVEFRIEND zeki
REMOVEFRIEND ziya
REMOVEFRIEND utku
LISTFRIENDS
ADDPST-TEXT 1st text post 39.2 32.81 ahmet
ADDPST-IMAGE 1st image post 37.87 32.46 demet:gizem image.png 135x250
ADDPST-VIDEO 1st video post 40.87 29.24 utku:gizem myvideo.avi 8
ADDPST-TEXT 2nd text post 38.35 33.1 demet:gizem:utku
REMOVEDLASTPOST
SHOWPOSTS adnan
BLOCK demet
BLOCK gizem
BLOCK ahmet
SHOWBLOCKEDFRIENDS
UNBLOCK ziya
UNBLOCK gizem
UNBLOCK gizem
SHOWBLOCKEDFRIENDS
SHOWBLOCKEDUSERS
SIGNOUT
```

The output of *mysocialbook* when such commands .txt is provided is given below. It is worth stressing here that you must print these to the screen **not into any file!**.

```
Command: ADDUSER Adnan adnan adnan1 01/01/1991 Selcuk Universitesi
Adnan has been successfully added.
-----
Command: REMOVEUSER 1
User has been successfully removed.
-----
Command: SIGNIN cemil cemil1
-----
Command: SIGNIN adnan adnan1
You have successfully signed in.
-----
Command: LISTUSERS
Name: Demet
Username: demet
Date of Birth: 16/01/1999
Username: Ankara Fen Lisesi
-----
Name: Zeki
Username: zeki
Date of Birth: 16/08/1987
Username: Kadikoy Lisesi
-----
Name: Gizem
Username: gizem
Date of Birth: 09/12/1997
Username: Hacettepe Universitesi
-----
Name: Utku
Username: utku
Date of Birth: 06/10/1999
Username: Bilkent Universitesi
-----
Name: Hakan
Username: hakan
Date of Birth: 01/03/1981
Username: Mugla S.K. Universitesi
-----
Name: Adnan
Username: adnan
Date of Birth: 01/01/1991
Username: Selcuk Universitesi
-----
Command: UPDATEPROFILE Adnan 07/01/1991 Gazi University
-----
Command: CHPASS adnan123 adnan1234
Password mismatch!
-----
Command: CHPASS adnan1 adnan123
-----
Command: ADDFRIEND ahmet
No such user!
-----
Command: ADDFRIEND demet
demet has been successfully added to your friend list.
-----
Command: ADDFRIEND demet
This user is already in your friend list!
-----
Command: ADDFRIEND gizem
gizem has been successfully added to your friend list.
-----
Command: ADDFRIEND utku
utku has been successfully added to your friend list.
-----
Command: ADDFRIEND ziya
No such user!
-----
Command: REMOVEFRIEND zeki
No such friend!
-----
Command: REMOVEFRIEND ziya
Error: Please sign in and try again.
-----
Command: REMOVEFRIEND utku
utku has been successfully removed from your friend list.
-----
Command: LISTFRIENDS
Name: Demet
Username: demet
Date of Birth: 16/01/1999
Username: Ankara Fen Lisesi
-----
Name: Gizem
Username: gizem
Date of Birth: 09/12/1997
Username: Hacettepe Universitesi
-----
```

```
-----
Command: ADDPOST-TEXT 1st text post 39.2 32.81 ahmet
ahmet is not your friend, and will not be tagged!
The post has been successfully added.
-----
Command: ADDPOST-IMAGE 1st image post 37.87 32.46 demet:gizem image.png 135x250
The post has been successfully added.
-----
Command: ADDPOST-VIDEO 1st video post 40.87 29.24 utku:gizem myvideo.avi 8
utku is not your friend, and will not be tagged!
The post has been successfully added.
-----
Command: ADDPOST-TEXT 2nd text post 38.35 33.1 demet:gizem:utku
utku is not your friend, and will not be tagged!
The post has been successfully added.
-----
Command: REMOVELASTPOST
Your last post has been successfully removed.
-----
Command: SHOWPOSTS adnan
*****
Adnan's Posts
*****
1st text post
Date: Sun May 02 15:52:49 EET 2021
Location: 32.81, 39.2
-----
1st image post
Date: Sun May 02 15:52:49 EET 2021
Location: 32.46, 37.87
Friends tagged in this post: Demet, Gizem
Image: image.png
Image resolution: 135x250
-----
1st video post
Date: Sun May 02 15:52:49 EET 2021
Location: 29.24, 40.87
Friends tagged in this post: Gizem
Video: myvideo.avi
Video duration: 8.0 minutes
-----
Command: BLOCK demet
demet has been successfully blocked.
-----
Command: BLOCK gizem
gizem has been successfully blocked.
-----
Command: BLOCK ahmet
No such user!
-----
Command: SHOWBLOCKEDFRIENDS
Name: Demet
Username: demet
Date of Birth: 16/01/1999
Username: Ankara Fen Lisesi
-----
Name: Gizem
Username: gizem
Date of Birth: 09/12/1997
Username: Hacettepe Universitesi
-----
Command: UNBLOCK ziya
No such user!
-----
Command: UNBLOCK gizem
gizem has been successfully unblocked.
-----
Command: UNBLOCK gizem
No such user in your blocked-user list!
-----
Command: SHOWBLOCKEDFRIENDS
Name: Demet
Username: demet
Date of Birth: 16/01/1999
Username: Ankara Fen Lisesi
-----
Command: SHOWBLOCKEDUSERS
Name: Demet
Username: demet
Date of Birth: 16/01/1999
Username: Ankara Fen Lisesi
-----
Command: SIGNOUT
You have successfully signed out.
```

## Command for Running the Application

```
java MySocialBook users.txt commands.txt
```

## Notes

- Your source code should be designed as **easy-to-follow**. **Place comment** in it as much as possible. Create separate source code files for the tasks you handled.
- Use  $\text{\LaTeX}$  to prepare your reports. Include UML diagram showing class hierarchy of *mysocialbook*. Once again, filled and signed declaration form should be first page of your report. **Reports must not exceed 5 pages in total**.
- **Do not miss** the deadline.
- **Save your work** until the beginning of next semester.
- The assignment must be **original, individual work**. **Duplicate or very similar assignments are both going to be considered as cheating**.
- You will submit your work on CENG1004 course page at <https://dys.mu.edu.tr> with the file hierarchy as below<sup>2</sup>:

```
→ <student id>.zip  
    → src.zip3  
    → Report.pdf
```

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<sup>2</sup>do not place any file into a directory. Just compress the content files.

<sup>3</sup>can contain packages.