# Chat Room LLD

## Terminology

### Chat Room

A virtual environment in which users can post their messages and read the messages written by other users.

### User

A person who interacts with the system.

### Nickname

A familiar or humorous name the user uses to identify himself.

### Registration

The act of recording user details.

### Login

The act of signing into the system by the user.

### Message

The text which the user delivers. Message content is limited to 150 characters.

### Message Frame

A written communication sent between the users of the system.
A wrapper for a message.Server structure

# Business Logic

## ChatRoom class

### Functionality

Operate the chat room and provides the user with the requested functionalities from the requirements document. This class is static.

### Fields :

**HOME_URL** - holds a static field with the url when running the server locally.
**BGU_URL** - holds a static field with the url when connecting to the server at the university.
_**location** - holds the client's location.
_**loggedinUser** - holds the current user info.

### enums

Place - can get the values of Home or University. helps to easily connect to a server that is running locally. (public)

### Properties

URL - return the server's url according to the client location.
LoggedInUser - get and set the lodged in user.

### Functions

**Start(Place location)** - initialize the ram with the registers users and messages, and set the location of the server according to location.
**exit()** - close the program.
**isLoggedIn()** - return if there is a looted in user
**register(string nickname)** - register with the given nickname and with our's groupID.
**logIn(string nickname)** - login with the given nickname and with our's groupID.

**logout()** - logout the user
**send(string body)** - send a new message with the given body
**SaveLast10FronServer()** - request the last 10 messages from the server
**request20Messages()** - receive the last 20 stored messages
**requestAllMessagesfromUser(string nickname, int GroupID)** - receive all the messages that was sent by the user with the given nickname on the requested group ID
**requestMessages(int number)** - receive the last n stored messages (private method)

# MessageSrvice class

### Functionality

handle the stored on RAM messages. This class is static

### Fields :

_**ramMessages** - hold the messages on the ram.

### Properties

RamMesseges - get and set the stored messages

### Functions

**start()** - initials the stored messaged from disk
**EditMessage(Guid ID, string newBody)** - edit the message with the given guid to the new content
**AllMessagesfromUser(IUser user)** - receive all the messages that was sent by the given  user.
**lastNMessages(int amount)** - receive the last n stored messages
**SaveLast10FronServer()** - request the last 10 messages from the server
**sort(ArrayList messages)** - sort the given messages by their date (private method)
**UpdateDisk()** - updates the disk after a chance was made on the ram (private method)
**SetRAM()** - draw messages from disk into ram (private method)

# UserSrvice class

## Functionality

handle the stored on RAM users. This class is static

## Fields :

**_ramUsers**- hold the users on the ram.

## Properties

RamUsers - get and set the stored users

## Functions

**start()** - initials the stored users from disk
**register(IUser user)** - save the given user to the ram after registration
**CanRegister(IUser user)** - returns if it is possible to register to the given user (not taken already)
**CanLogIn(IUser user)** - returns if it is possible to login to the given user (was registered)
**UpdateDisk()** - updates the disk after a chance was made on the ram (private method)
**SetRAM()** - draw users from disk into ram (private method)

# IUser interface

## Functionality

This is an interface that representing a user

## Properties

NickName - get this user’s nickname
Group_ID - get this user’s nickname

### Functions

**Send(string msg, string url)** - send a new message to the server with the requested content to the given url
**logout()** - logout this user

## User class

### Functionality

Implements IUser interface. represent a user in the chat room

### Fields :

**_groupID** - the group ID of this user.
**_nickName** - the nickname of this user.
**GROUP_ID** – the group ID of our team from the registration sheet.

### Properties

Implements the IUser's properties :
NickName - get this user's nickname
Group_ID - get this user's nickname

### Functions

**Send(string msg, string url)** - send a new message to the server with the requested content to the given url
**logout()** - logout this user
**Equals(object obj)** - return if two users are equals (same group ID and nickname) - override object's Equals method
**ToString()** - return a string that represent this user - override object's ToString method

# Message class

## Functionality

Implements IMessage interface. represent a message in the chatroom

## Fields :

_**guid** - the unique identifier of this message, the guid.
_**recivingTime** - the time this message was received by the server
_**sender** - the user that sent this message
_**body** - the content of this message

## Properties

Implements the properties of IMessage :

Date - get the receiving time

GroupID - get the group ID of the sender

Id - get the guid go this message

MessageContent - get and set (private setter) the contest of this message

UserName - get the sender’s user name

Sender - get the sender of this message (private, not from IMessage)

## Functions

**editbody(string newBody)** - edit the content of this message
**isValid(string body)** -return if the body is valid. A static method.
**Equals(object obj)** - return if two messages are equals (same guid) - override object’s Equals method
**ToString()** - return a string that represent this message - override object’s ToString method

# MessageComparatorByDate class

## Functionality

Implements IComparer interface. compares to messages according to their receiving by server time.

## Functions

**Compare(object x, object y)** - compare two messages x, y. return a positive number if x>y (x was send later), negative number id x<y (x was sent earlier), and 0 if both was sent at the same time

# MergeTwoArrays class

## Functionality

This class merges two ArrayLists into the first one,  and avoids duplications. This class is static.

## Functions

**mergeIntoFirst(ArrayList array1, ArrayList array2)** - merge the two ArrayLists into array1,  and avoids duplications

# Persistent Layer

## SerializationService class

### Functionality

Enable to serialize and deserialize any object to any file. Static class.

### Functions

**serialize(object toSerialize, string fileName)** - serialize the given object to fileName
**deserialize(string fileName)** - deserialize an object from fileName

## UserSerializationService class

### Functionality

Enable to serialize and deserialize the users. This class is static.

### Properties

**USERS_LIST** - hold the location to serialize and deserialize users from

### Functions

**serialize(ArrayList users)** - serialized the users
**deserialize()** -desterilize the uses

## MessageSerializationService class

### Functionality

Enable to serialize and deserialize the messages. This class is static.

### Properties

**Messages_LIST** - hold the location to serialize and deserialize messages from

### Functions

**serialize(ArrayList mesages)** - serialize the  messages
**deserialize()** - deserialize the messages

# Logging Layer

## Logger class

### Functionality

Operate the lodger. This class is static.

### Fields :

log - holds a static field with the logger

### Properties

Log - get the logger

### Functions

**Developer(string logMessage)** - can be used to put a reference at the begetting of the message - “Developer : “ to inform that this logged message is for the developer
**Maintenance(string logMessage)** - can be used to put a reference at the begetting of the message - “Maintenance : “ to inform that this logged message is for the maintenance
**MethodStart(MethodBase method)** - can be used to put a state when a method was entered for debugging
**MethodStart(string methodName, string className)** - can be used to put a state when a method was entered for debugging

# Presentation Layer

## CLI class

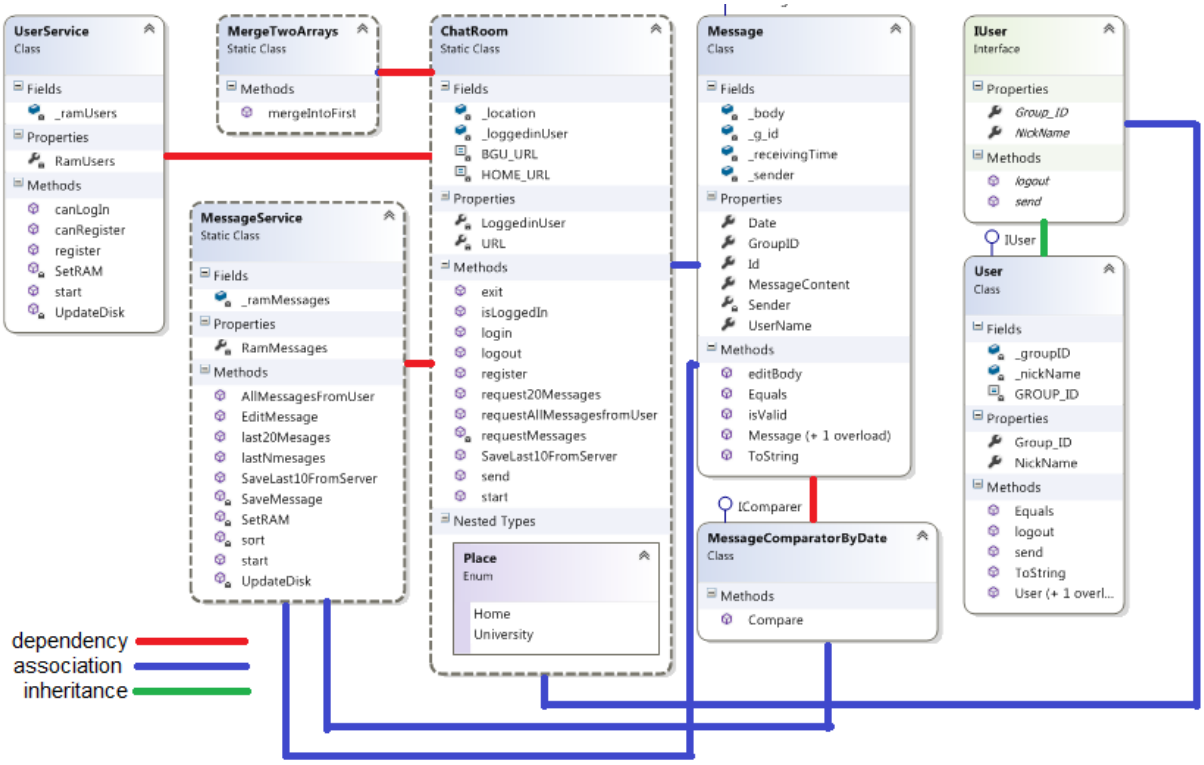
### Functionality

Operate the common-line interface. This class use the singleton design

### Functions

**CLI()**- implements the CLI as a singleton.
**initialize()**-initialize(): used in order to initialize the CLI. introducing the user to the chat room instructions and allows him to interact with the relevant menu.
**entranceManager()**-This menu handles a client which isn't logged-in in the chat room.
**selectionMenu()**-This menu handles a client that has logged-in.
**retrieveMessages()-**Trying to retrieve last 10 messages from server, responds accordingly if the attempt was successful or not.
**display20Messages()**-Trying to display last 20 messages from server, responds accordingly if the attempt was successful or not.
**displayUserMessages()**-Trying to display all retrieved messages of a certain user, responds accordingly if the attempt was successful or not.
**writeMessage()-**This function allows a user to send a new message, only if under 150 chars.
**logoutFunction()**-Handles login-out.
**menuNotification()**-A message that pops-up when a user is pressing irrelevant keys (Instructions for menus).
**boldingText(string text, ConsoleColor color)**- Displays the text in the requested color.
**login()**-Handles login-in.
**register()**-Handles registration.
**exitFunction()**-Handles exit request.
**arrayPrinter(ArrayList array)**- An easy way to print the relevant array received from the ChatRoom class.

# UMLs


UserService
Class
Fields
_ramUsers
Properties
RamUsers
Methods
canLogIn
canRegister
register
SetRAM
start
UpdateDisk
MergeTwoArrays
Static Class
Methods
mergeIntoFirst
ChatRoom
Static Class
Fields
_location
_loggedinUser
BGU_URL
HOME_URL
Properties
LoggedinUser
URL
Methods
exit
isLoggedIn
login
logout
register
request20Messages
requestAllMessagesfromUser
requestMessages
SaveLast10FromServer
send
start
Nested Types
Place
Enum
Home
University
Message
Class
Fields
_body
_g_id
_receivingTime
_sender
Properties
Date
GroupID
Id
MessageContent
Sender
UserName
Methods
editBody
Equals
isValid
Message (+ 1 overload)
ToString
IUser
Interface
Properties
Group_ID
NickName
Methods
logout
send
IUser
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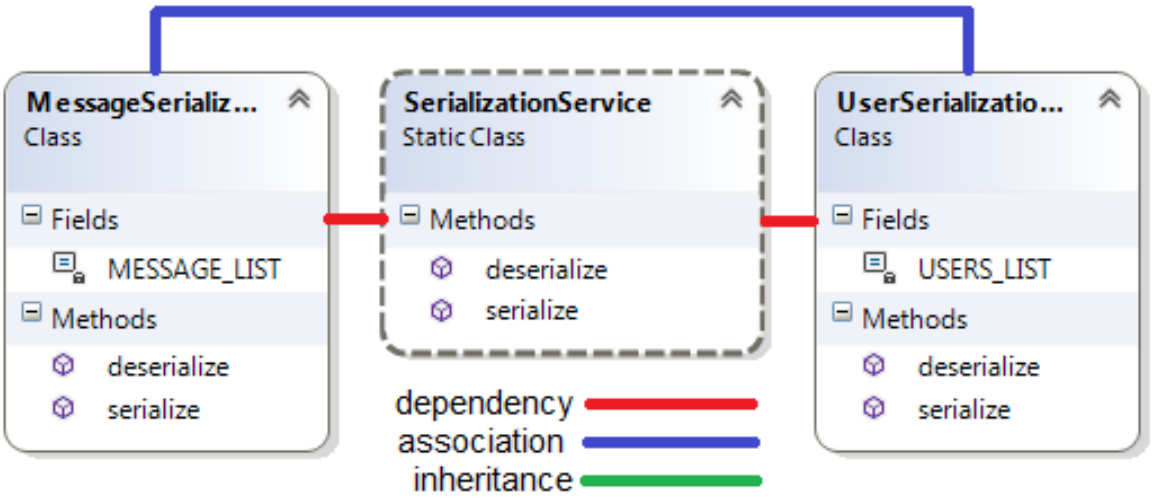
Class
Fields
_groupID
_nickName
GROUP_ID
Properties
Group_ID
NickName
Methods
Equals
logout
send
ToString
User (+ 1 overl...
MessageService
Static Class
Fields
_ramMessages
Properties
RamMessages
Methods
AllMessagesFromUser
EditMessage
last20Mesages
lastNmesages
SaveLast10FromServer
SaveMessage
SetRAM
sort
start
UpdateDisk
IComparer
MessageComparatorByDate
Class
Methods
Compare
dependency
association
inheritance


MessageSerializ...
Class
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MESSAGE_LIST
Methods
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Static Class
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UserSerializatio...
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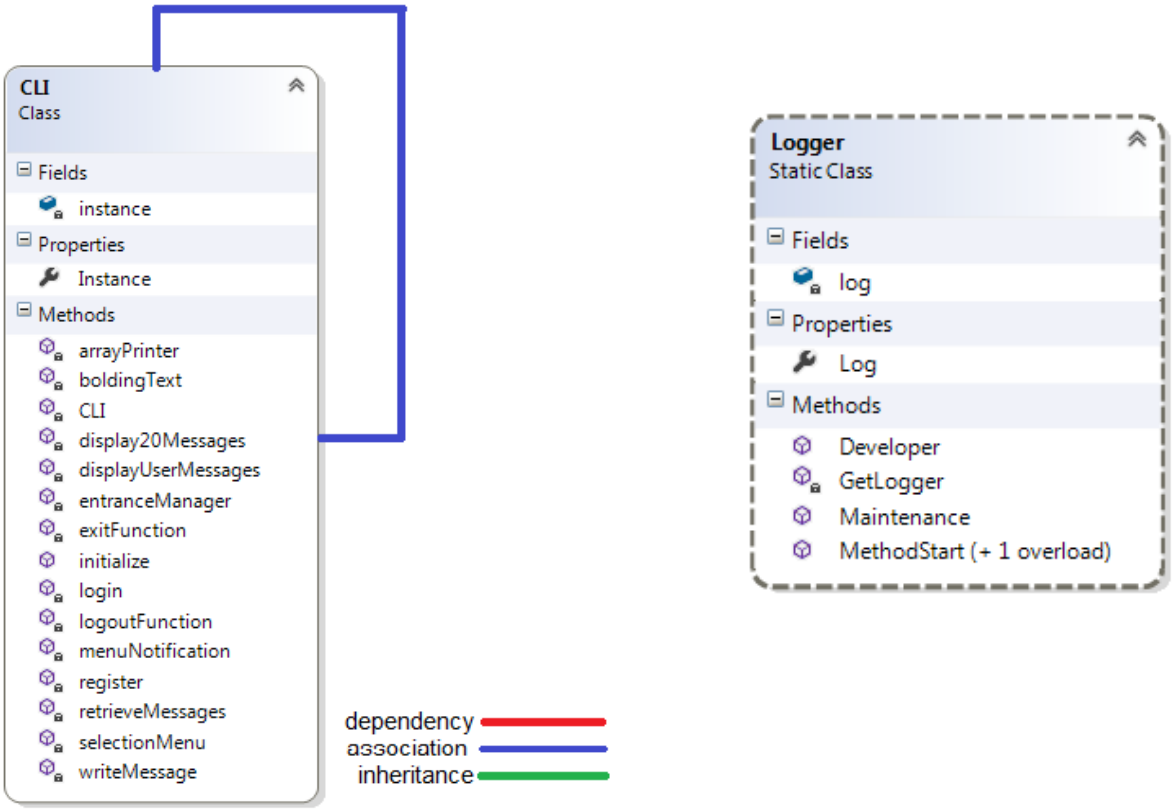
CLI
Class
Fields
instance
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Instance
Methods
arrayPrinter
boldingText
CLI
display20Messages
displayUserMessages
entranceManager
exitFunction
initialize
login
logoutFunction
menuNotification
register
retrieveMessages
selectionMenu
writeMessage
Logger
Static Class
Fields
log
Properties
Log
Methods
Developer
GetLogger
Maintenance
MethodStart (+ 1 overload)
dependency
association
inheritance