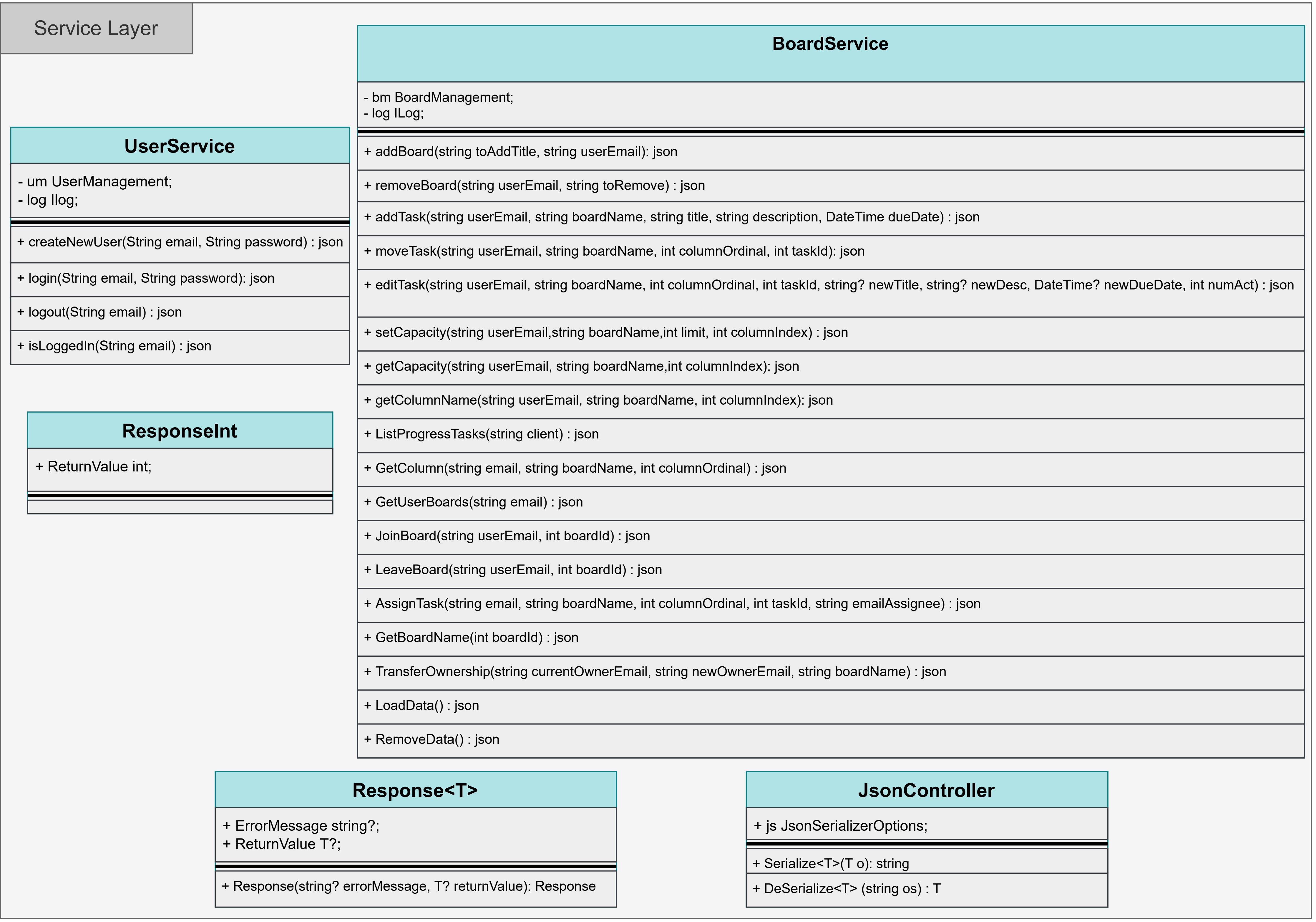


## Service Layer

### UserService

```
- um UserManagement;
- log Ilog;
------------------------------------------------
+ createNewUser(String email, String password) : json
+ login(String email, String password): json
+ logout(String email) : json
+ isLoggedIn(String email) : json
```

### ResponseInt

```
+ ReturnValue int;
------------------------------------------------
```

### BoardService

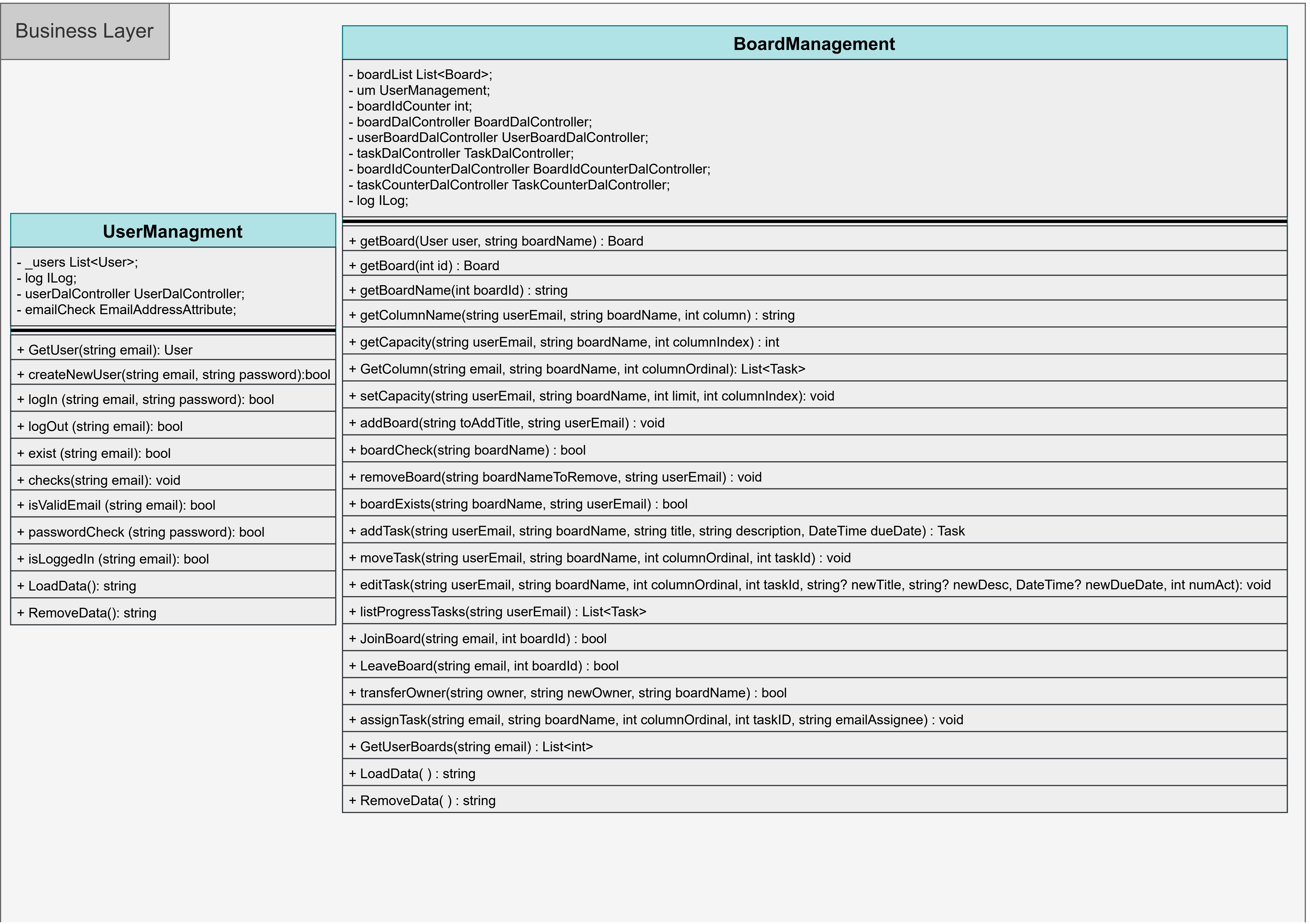
```
- bm BoardManagement;
- log ILog;
------------------------------------------------
+ addBoard(string toAddTitle, string userEmail): json
+ removeBoard(string userEmail, string toRemove) : json
+ addTask(string userEmail, string boardName, string title, string description, DateTime dueDate) : json
+ moveTask(string userEmail, string boardName, int columnOrdinal, int taskId): json
+ editTask(string userEmail, string boardName, int columnOrdinal, int taskId, string? newTitle, string? newDesc, DateTime? newDueDate, int numAct) : json
+ setCapacity(string userEmail,string boardName,int limit, int columnIndex) : json
+ getCapacity(string userEmail, string boardName,int columnIndex): json
+ getColumnName(string userEmail, string boardName, int columnIndex): json
+ ListProgressTasks(string client) : json
+ GetColumn(string email, string boardName, int columnOrdinal) : json
+ GetUserBoards(string email) : json
+ JoinBoard(string userEmail, int boardId) : json
+ LeaveBoard(string userEmail, int boardId) : json
+ AssignTask(string email, string boardName, int columnOrdinal, int taskId, string emailAssignee) : json
+ GetBoardName(int boardId) : json
+ TransferOwnership(string currentOwnerEmail, string newOwnerEmail, string boardName) : json
+ LoadData() : json
+ RemoveData() : json
```

### Response<T>

```
+ ErrorMessage string?;
+ ReturnValue T?;
------------------------------------------------
+ Response(string? errorMessage, T? returnValue): Response
```

### JsonController

```
+ js JsonSerializerOptions;
------------------------------------------------
+ Serialize<T>(T o): string
+ DeSerialize<T> (string os) : T
```


Business Layer

**UserManagment**

```
- _users List<User>;
- log ILog;
- userDalController UserDalController;
- emailCheck EmailAddressAttribute;
```

```
+ GetUser(string email): User
+ createNewUser(string email, string password):bool
+ logIn (string email, string password): bool
+ logOut (string email): bool
+ exist (string email): bool
+ checks(string email): void
+ isValidEmail (string email): bool
+ passwordCheck (string password): bool
+ isLoggedIn (string email): bool
+ LoadData(): string
+ RemoveData(): string
```

**BoardManagement**

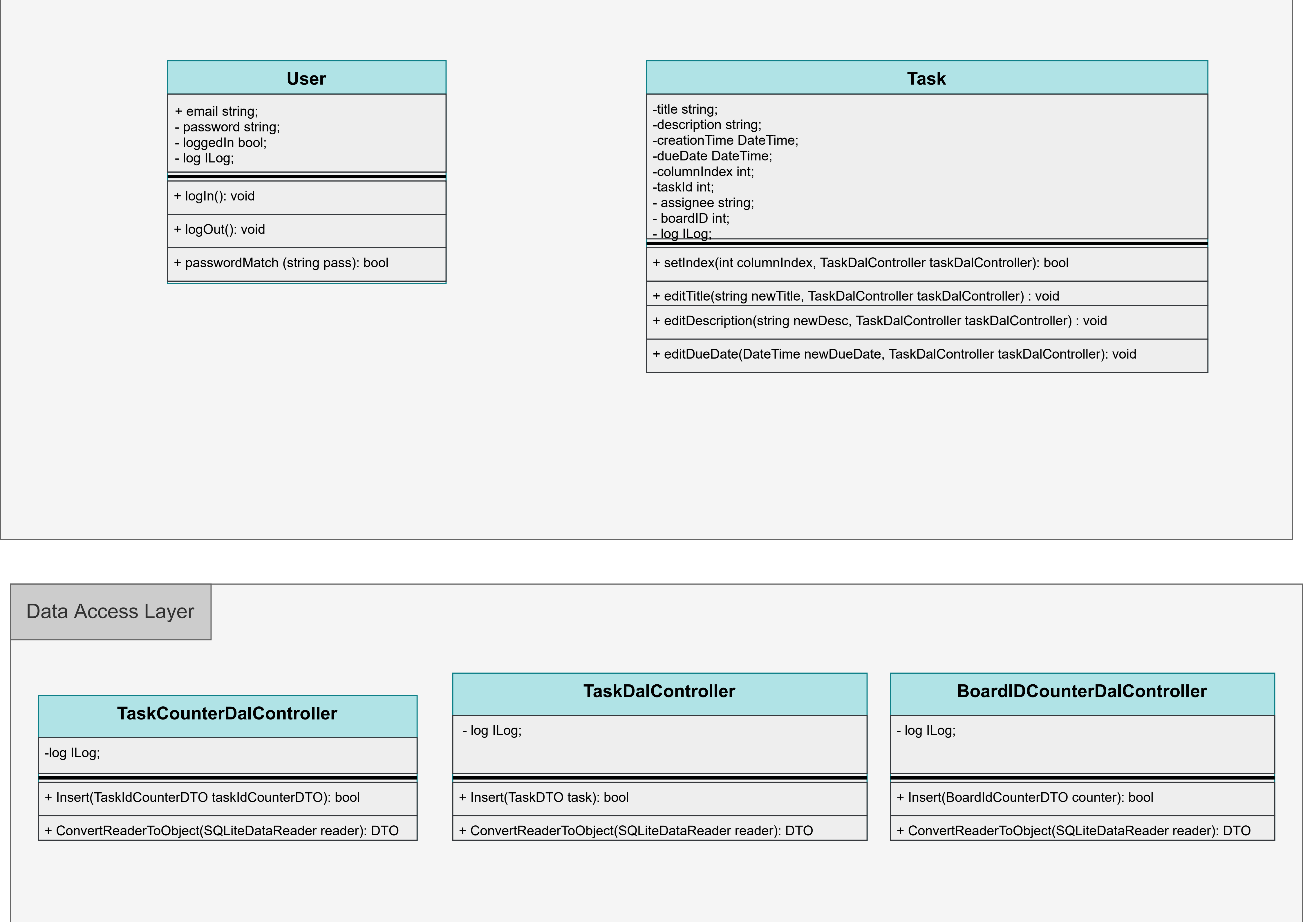
```
- boardList List<Board>;
- um UserManagement;
- boardIdCounter int;
- boardDalController BoardDalController;
- userBoardDalController UserBoardDalController;
- taskDalController TaskDalController;
- boardIdCounterDalController BoardIdCounterDalController;
- taskCounterDalController TaskCounterDalController;
- log ILog;
```

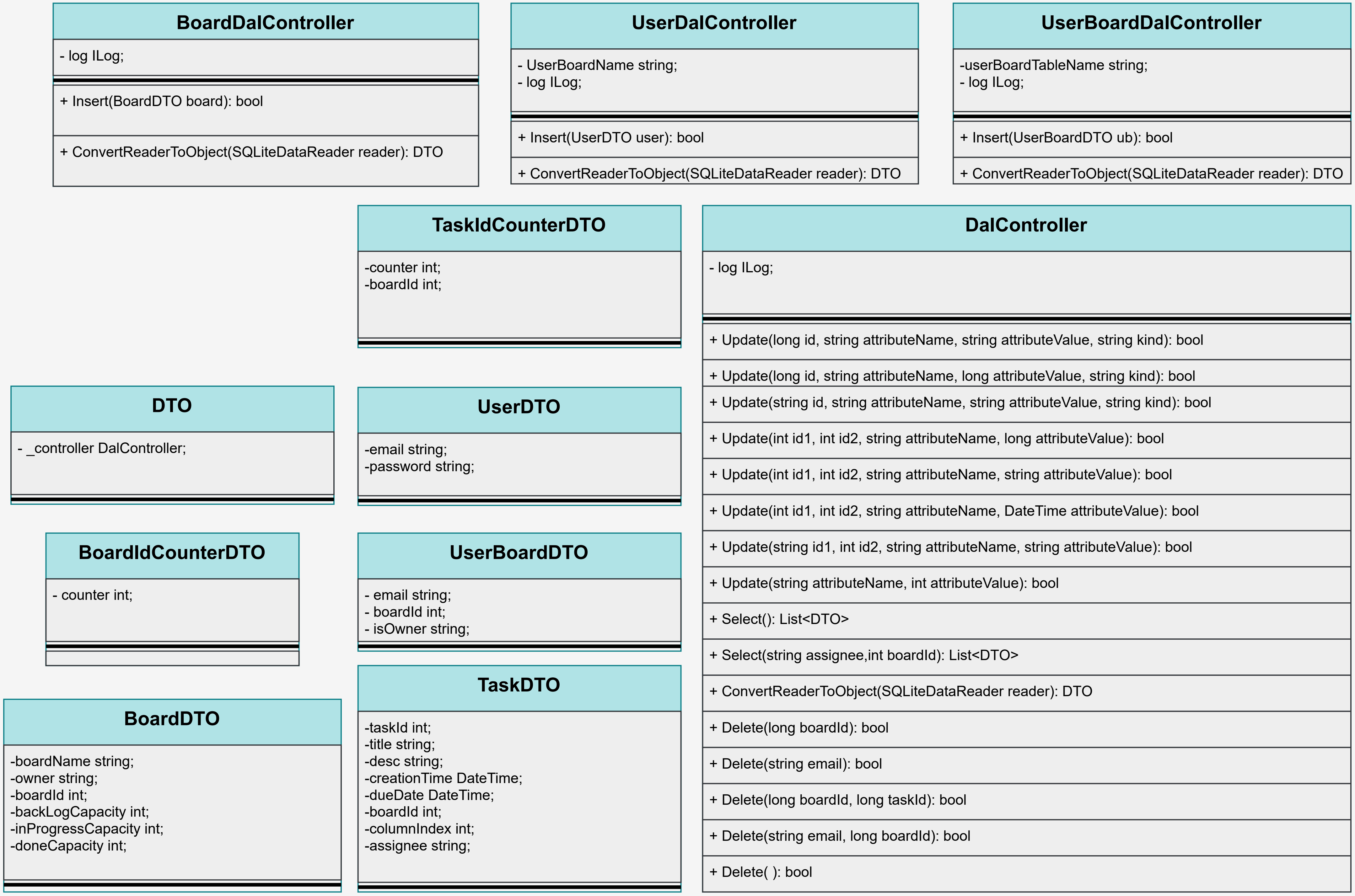
```
+ getBoard(User user, string boardName) : Board
+ getBoard(int id) : Board
+ getBoardName(int boardId) : string
+ getColumnName(string userEmail, string boardName, int column) : string
+ getCapacity(string userEmail, string boardName, int columnIndex) : int
+ GetColumn(string email, string boardName, int columnOrdinal): List<Task>
+ setCapacity(string userEmail, string boardName, int limit, int columnIndex): void
+ addBoard(string toAddTitle, string userEmail) : void
+ boardCheck(string boardName) : bool
+ removeBoard(string boardNameToRemove, string userEmail) : void
+ boardExists(string boardName, string userEmail) : bool
+ addTask(string userEmail, string boardName, string title, string description, DateTime dueDate) : Task
+ moveTask(string userEmail, string boardName, int columnOrdinal, int taskId) : void
+ editTask(string userEmail, string boardName, int columnOrdinal, int taskId, string? newTitle, string? newDesc, DateTime? newDueDate, int numAct): void
+ listProgressTasks(string userEmail) : List<Task>
+ JoinBoard(string email, int boardId) : bool
+ LeaveBoard(string email, int boardId) : bool
+ transferOwner(string owner, string newOwner, string boardName) : bool
+ assignTask(string email, string boardName, int columnOrdinal, int taskID, string emailAssignee) : void
+ GetUserBoards(string email) : List<int>
+ LoadData( ) : string
+ RemoveData( ) : string
```

## Board

```
+ boardName string;
- backlogList List<Task>;
- inProgressList List<Task>;
- doneList List<Task>;
- owner string;
- capacities int[];
- taskIdCounter int;
- boardId int;
- collaborators List<string>;
- log ILog;
```

```
+ getCapacity(int columnIndex): int
+ getColumn(int columnOrdinal): List<Task>
+ listInProgressTask(string email): List<Task>
+ getTask(int taskId): Task
+ getTask(int columnOrdinal, int taskId): Task
+ setCapacity(int limit, int columnIndex, BoardDalController boardDalController) : void
+ addTask(string title, string desc, DateTime dueDate, TaskDalController taskDalController) : Task
+ moveTask(int columnOrdinal, int taskId, string email, TaskDalController taskDalController): void
+ editTask(int columnOrdinal, int taskId, string? newTitle, string? newDesc, DateTime? newDueDate, int numAct, string email, TaskDalController taskDalController) : void
+ isMember(string email) : bool
+ addMember(string email) : void
+ removeMember(string email, TaskDalController taskDalController) : bool
+ assignTask(string assignee, string newAssignee, int taskId, int columnOrdinal) : void
+ transferOwner(string newOwner, BoardDalController boardDalController, UserBoardDalController userBoardDalController) : bool
```


User
+ email string;
- password string;
- loggedIn bool;
- log ILog;
+ logIn(): void
+ logOut(): void
+ passwordMatch (string pass): bool
Task
-title string;
-description string;
-creationTime DateTime;
-dueDate DateTime;
-columnIndex int;
-taskId int;
- assignee string;
- boardID int;
- log ILog;
+ setIndex(int columnIndex, TaskDalController taskDalController): bool
+ editTitle(string newTitle, TaskDalController taskDalController) : void
+ editDescription(string newDesc, TaskDalController taskDalController) : void
+ editDueDate(DateTime newDueDate, TaskDalController taskDalController): void
Data Access Layer
TaskCounterDalController
-log ILog;
+ Insert(TaskIdCounterDTO taskIdCounterDTO): bool
+ ConvertReaderToObject(SQLiteDataReader reader): DTO
TaskDalController
- log ILog;
+ Insert(TaskDTO task): bool
+ ConvertReaderToObject(SQLiteDataReader reader): DTO
BoardIDCounterDalController
- log ILog;
+ Insert(BoardIdCounterDTO counter): bool
+ ConvertReaderToObject(SQLiteDataReader reader): DTO


BoardDalController
- log ILog;
+ Insert(BoardDTO board): bool
+ ConvertReaderToObject(SQLiteDataReader reader): DTO
UserDalController
- UserBoardName string;
- log ILog;
+ Insert(UserDTO user): bool
+ ConvertReaderToObject(SQLiteDataReader reader): DTO
UserBoardDalController
-userBoardTableName string;
- log ILog;
+ Insert(UserBoardDTO ub): bool
+ ConvertReaderToObject(SQLiteDataReader reader): DTO
TaskIdCounterDTO
-counter int;
-boardId int;
DalController
- log ILog;
+ Update(long id, string attributeName, string attributeValue, string kind): bool
+ Update(long id, string attributeName, long attributeValue, string kind): bool
+ Update(string id, string attributeName, string attributeValue, string kind): bool
+ Update(int id1, int id2, string attributeName, long attributeValue): bool
+ Update(int id1, int id2, string attributeName, string attributeValue): bool
+ Update(int id1, int id2, string attributeName, DateTime attributeValue): bool
+ Update(string id1, int id2, string attributeName, string attributeValue): bool
+ Update(string attributeName, int attributeValue): bool
+ Select(): List<DTO>
+ Select(string assignee,int boardId): List<DTO>
+ ConvertReaderToObject(SQLiteDataReader reader): DTO
+ Delete(long boardId): bool
+ Delete(string email): bool
+ Delete(long boardId, long taskId): bool
+ Delete(string email, long boardId): bool
+ Delete( ): bool
DTO
- _controller DalController;
UserDTO
-email string;
-password string;
BoardIdCounterDTO
- counter int;
UserBoardDTO
- email string;
- boardId int;
- isOwner string;
TaskDTO
-taskId int;
-title string;
-desc string;
-creationTime DateTime;
-dueDate DateTime;
-boardId int;
-columnIndex int;
-assignee string;
BoardDTO
-boardName string;
-owner string;
-boardId int;
-backLogCapacity int;
-inProgressCapacity int;
-doneCapacity int;

***Design changes:***

- Each task now has a unique id in the board.
- Every task has a person assigned to it- an assignee. Once this person leaves a board, his assigned tasks that are not done become unassigned. As a result we added the method assignTask in BoardManagement and the method assign in Task.
- Each board has now a unique id in the system.
- Each user can join and leave existing boards created by someone else, without getting permission. As a result, we added the methods joinBoard and leaveBoard in BoardManagement and in Board.
- Each board owner can transfer the board ownership to another board member. As a result, we added the method transferOwner in BoardManagement and in Board.
- Added DataAccessLayer with their respective DataTransferObjects, responsible for translating objects and variables of our project into objects suitable to be added as entries into our database.
- Added database kanban.db.
- Added DataAccesLayer Controllers for each of the DataTransferObjects, responsible for communicating with the database and manipulating it (adding entries, removing entries).
- Added loadData, responsible for loading missing information from the database into our project, method is found in BoardManagement and UserManagement.
- Added removeData method, responsible for removing entries from the tables of our database and clearing our project (clearing lists, resetting ids etc.), found in BoardManagement and Usermanagement.
- Added boardExistLoad method that checks if the board exists with this email, and also added getUserBoards that gets the user boards.
- Added new constructor for BoardService and added getUserBoards in BoardService.
- Added a new constructor for UserService.