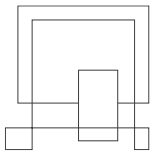


LogiWord

Brain training Android Application

Bachelor's degree in software engineering

Project report

Group:

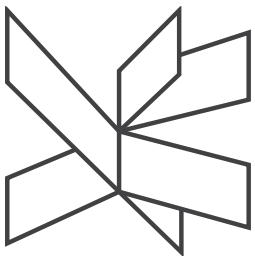
Akos Faddi – 253992

David Kabaly – 253785

Krzysztof Majcher – 253784

Supervisor:

Kasper Knop Rasmussen



VIA University College

Software Engineering

Bachelor

20-12-2019

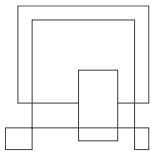
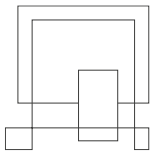


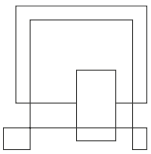
Table of contents



Appendix A – Use case descriptions

Use Case	Multiplayer Match
Actor	User
Description	The user will compete against an opponent to complete a word and achieve more points than the enemy.
Precondition	The user logged in and is online
Postcondition	The user played a multiplayer match and gets a score

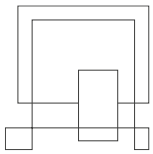
Use Case	Challenge a friend
Actor	User
Description	The user can select an opponent from the friend list to play a match against each other. They will get a word and should make the most points out of the word based on mathematical calculations.
Precondition	The user logged in and is online
Postcondition	The user played a multiplayer match against a friend



Use Case	Random Match
Actor	User
Description	The user will get a random opponent to play a match against. They have to earn the most points with limited mathematical signatures.
Precondition	The user logged in and is online
Postcondition	The user played a multiplayer match against a random opponent

Use Case	Classic Mode
Actor	User
Description	The user will get limited resources like few numbers and operations and tries to get as many points as possible
Postcondition	The user played a single-player match and gets a score

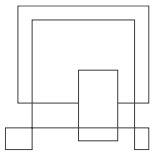
Use Case	Daily Challenge
Actor	User
Description	The user will get a word daily that needs to be completed with the given resources
Precondition	The user logged in and is online
Postcondition	The user played a daily challenge and gets a score



Use Case	Multiplayer Scores
Actor	User
Description	The user can see a ranking list based on the scores in multiplayer.
Precondition	The user is online and logged in
Postcondition	The ranking list is displayed

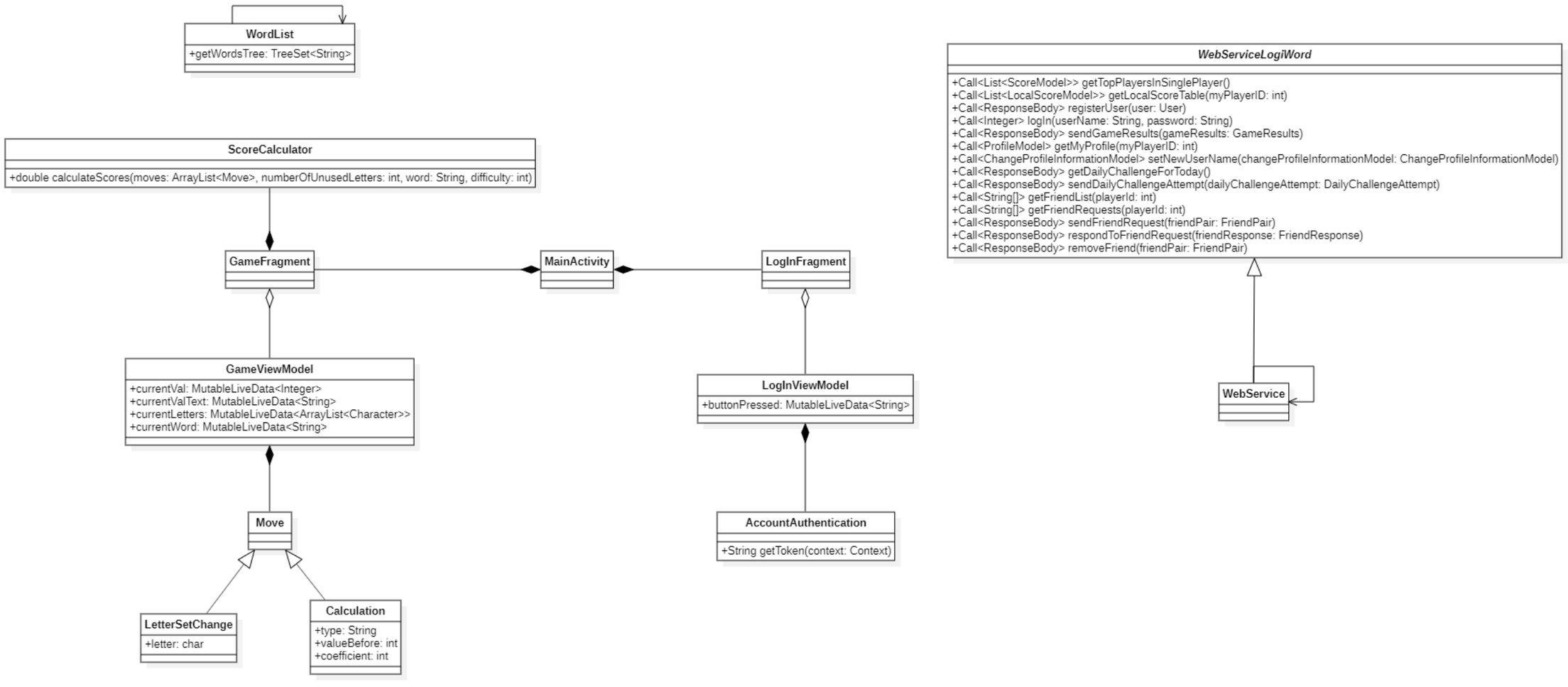
Use Case	Single Player Scores
Actor	User
Description	The user can check the single-player scores what have been achieved.
Postcondition	The single-player scores are displayed

Use Case	Tutorial
Actor	User
Description	User can access the prepared form of a tutorial that explains the basics mechanics of the application. This option will be highlighted if the user is using the system for the first time.
Postcondition	The user played the tutorial match

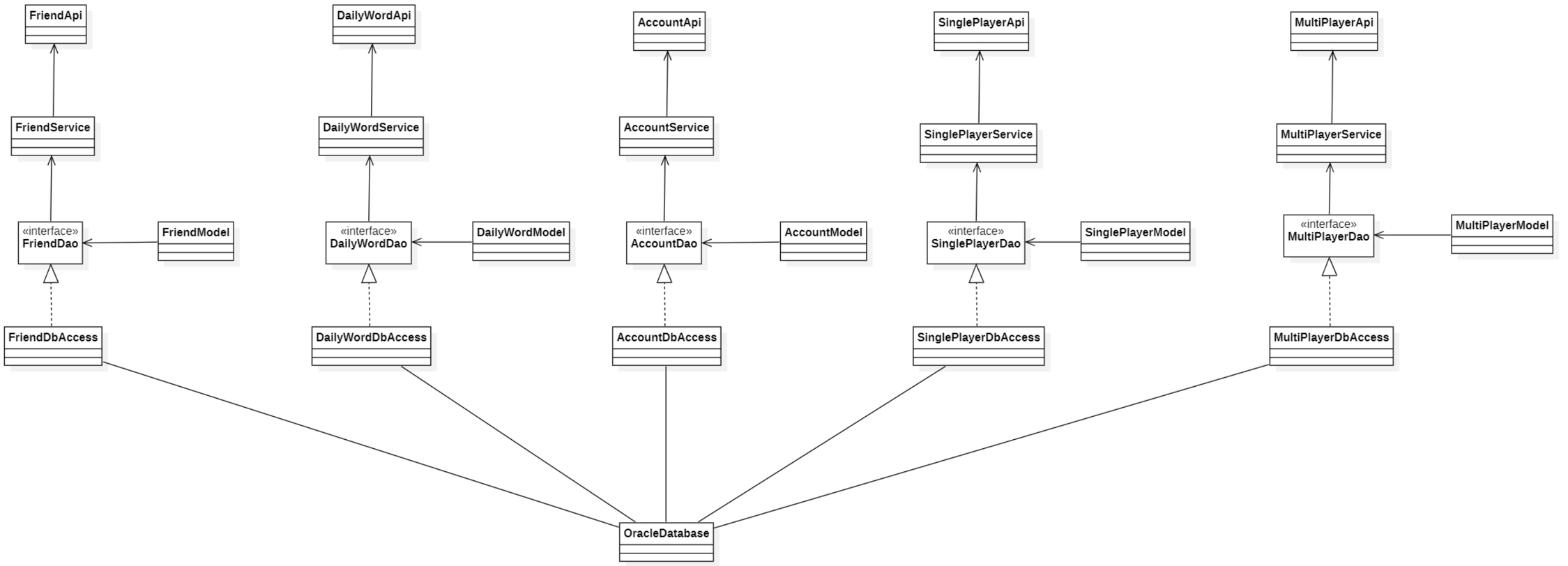


Use Case	Friend List
Actor	User
Description	User can access the friend list where all other players will be displayed what the user added. The online or offline status also will be shown in there and the invites from other users. It is possible to add a friend based on the given email address in the system. In this menu, the user can also remove a friend.
Precondition	The user is online and logged in
Postcondition	The user managed the friend list

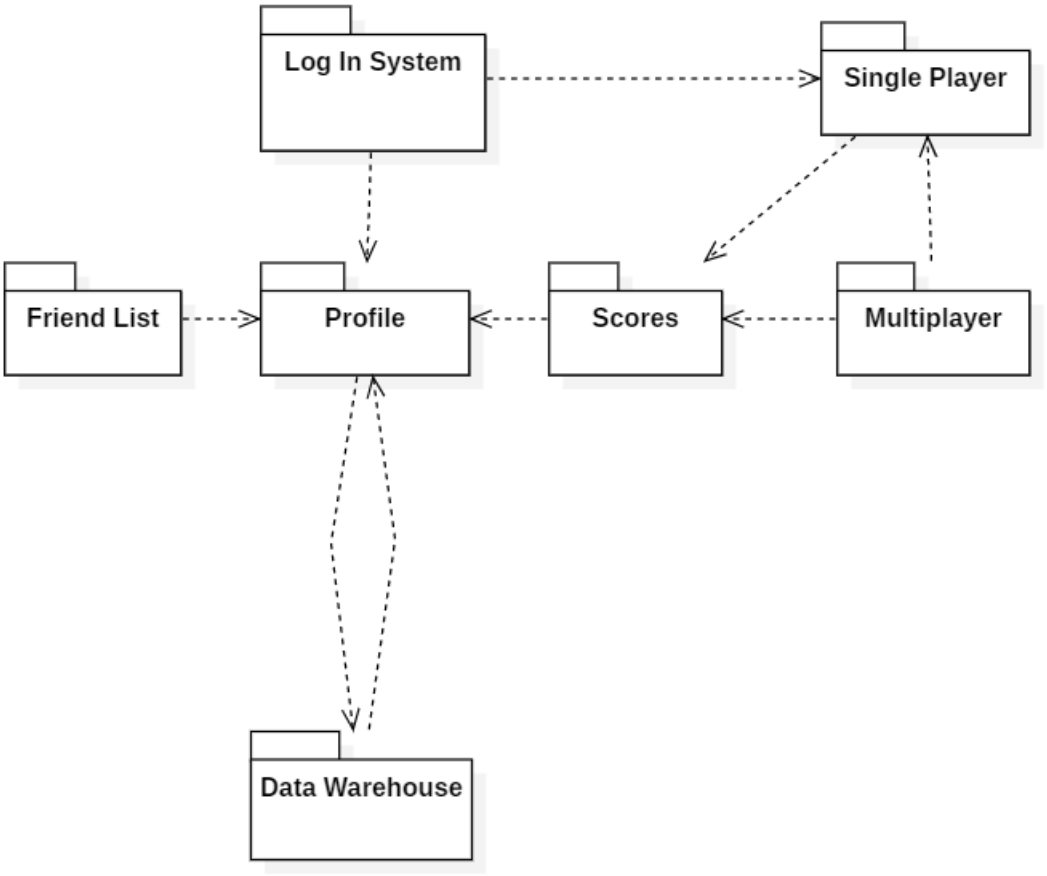
Appendix B – Client Class Diagram



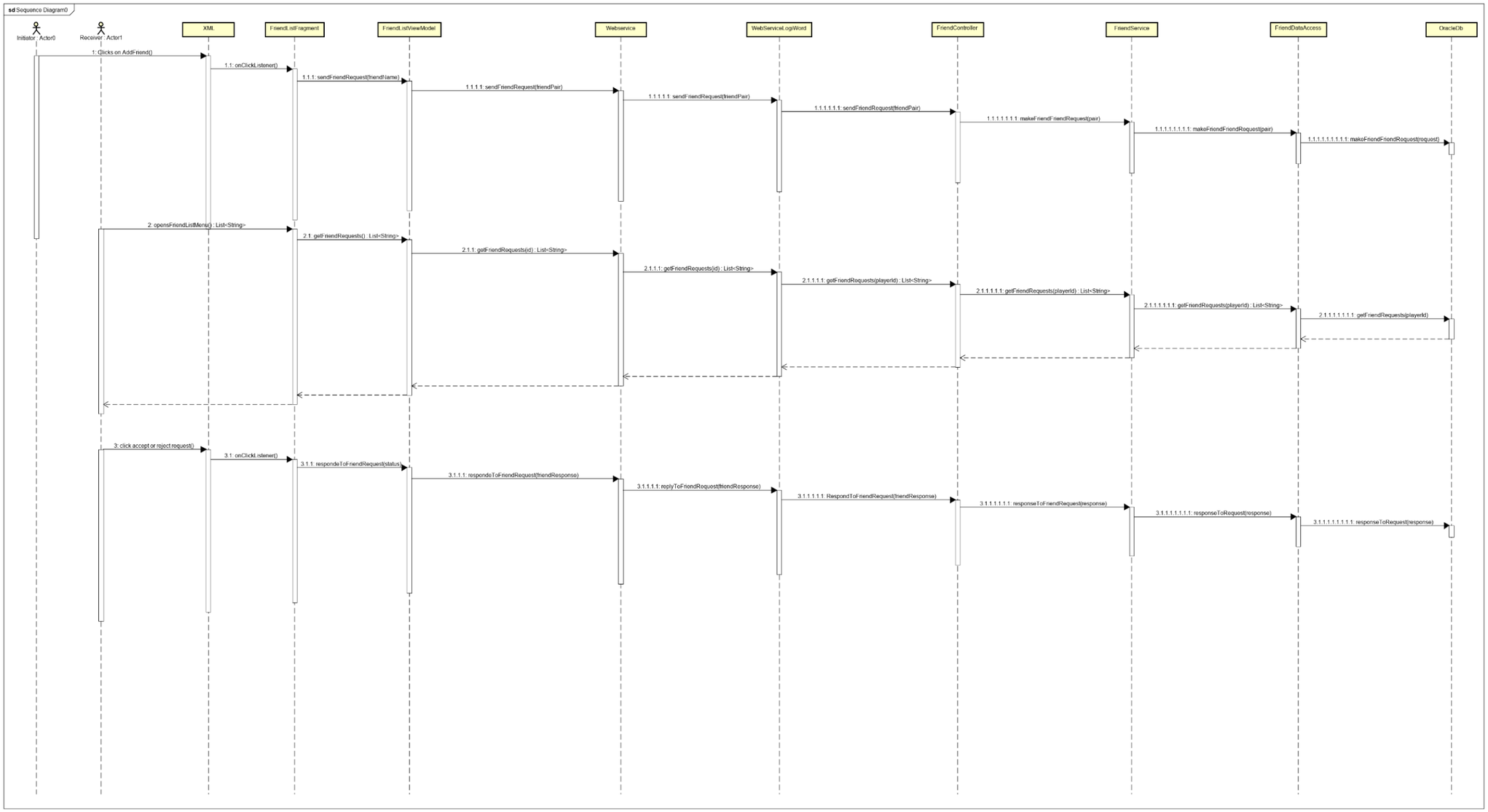
Appendix C – Server Class Diagram



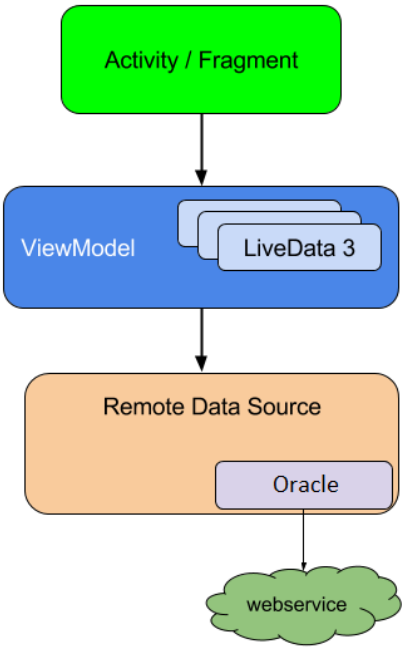
Appendix D – Package Diagram



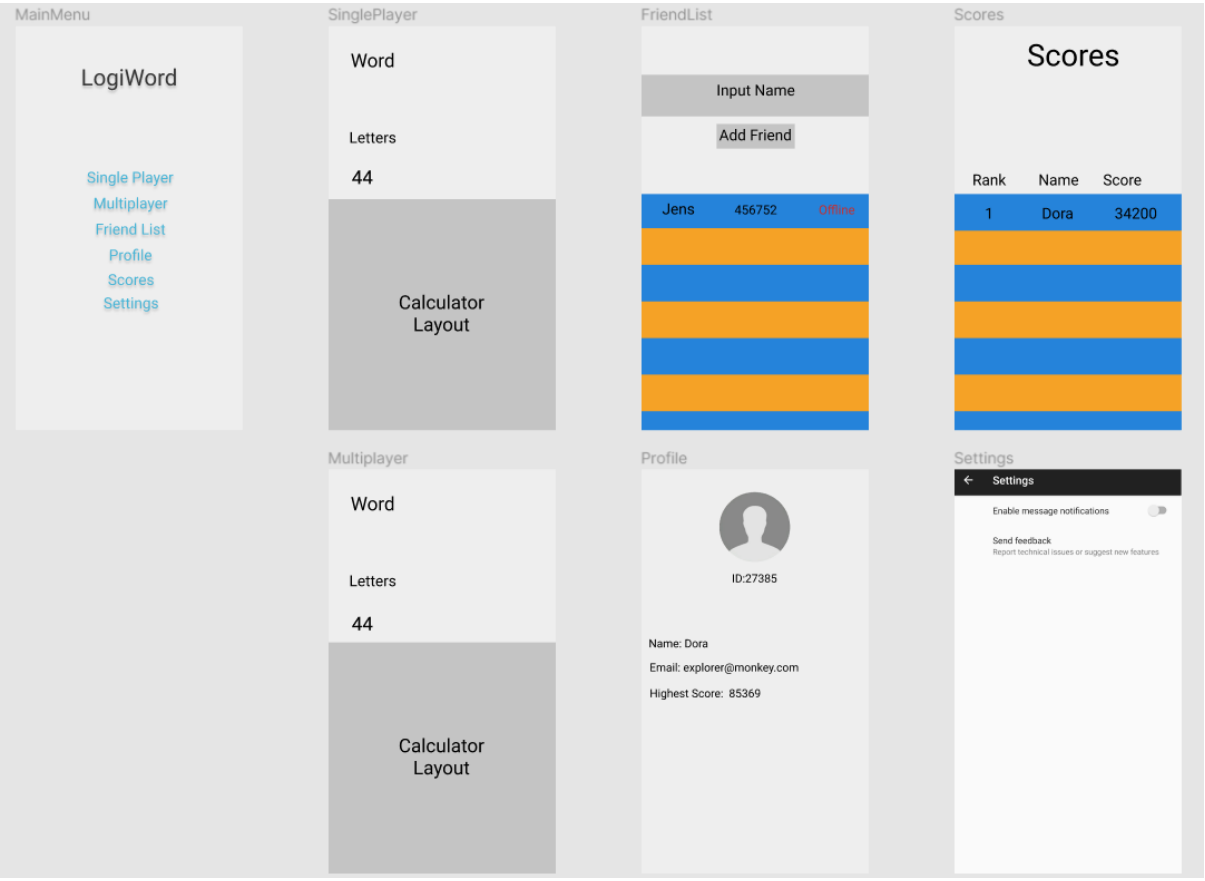
Appendix E – Sequence Diagram

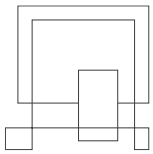


Appendix F – Architecture Diagram



Appendix G – Predesign Figma plans



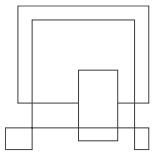


Appendix H – Scrum

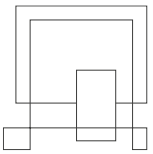
Product backlog

The product backlog contains the tasks that we set as our goals for this project. The story points represent the expected hours of work to complete the tasks.

Product backlog	Story points	Status
ER diagram and description	7	Done
Package diagram	3	Done
Architecture diagram	1	Done
Class diagrams	6	Done
Interaction diagrams	5	Done
UI design	4	Done
UI design description	3	Done
Identify design patterns and describe them	2	Done
Introduction	2	Done
MosCow	5	Done
Requirement description	1	Done
Domain model and entities	8	Done
Use case documentation	8	Done
Background description	2	Done
Implementation documentation	20	Done
Test documentation	15	Done
Appendix	10	Done
Project report closing chapters	15	Done
Process report	25	Done
Package diagram fix	0.5	Done
Architecture diagram fix	0.5	Done
Description of technologies	3	Done
Client-side class diagram fix	3	Done
Server-side class diagram fix	6	Done
Change UI design	2	Done



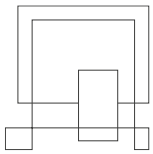
Rich picture	5	Done
Acronyms and abbreviations	3	Done
Dimensional modelling	5	Done
MVC and MVVM	12	Done
Update use case documentation	4	Done
Update pattern documentation (dao, adapter)	7	Done
Update ER description	1	Done
Change rich picture	3	Done
Solid principle	3	Done
Analysis intro	1	Done
UI design documentation	3	Done
Server technologies	2	Done
Revision of project report	65	Done
References, table of contents, etc	10	Done
Small chapters	5	Done
System features	3	Done
Database implementation	5	Done
Menu implementation	5	Done
Basic server setup	30	Done
Connect client and server	15	Done
Game UI implementation	5	Done
Core game mechanics implementation	55	Done
Single Player Api	15	Done
Single Player Client	10	Done
Daily word API	15	Done
Daily word client	5	Done
Scores server	20	Done
Scores client	20	Done
Account management client	15	Done
Account management Server	15	Done
FriendList client	5	Done
FriendList Server	8	Done
Multiplayer client	30	Not implemented
Multiplayer server	30	Not implemented



Challenge friend client	10	Not implemented
Challenge friend server	5	Not implemented
Cache the data on the client	30	Not implemented
Tutorial	20	Not implemented
Achievements Client	20	Not implemented
Achievements Server	8	Not implemented
Hints	10	Not implemented
Multilanguage client	10	Not implemented
Multilanguage Server	10	Not implemented
History tab client	20	Not implemented
History tab server	10	Not implemented
Animations	5	Done
Testing	20	Done
Research Spring, JPA and DAO	10	Done
Fixing Toolbar for fragments	3	Done
Reviewing codes	7	Done
Setting menu	5	Done
Loading screen	5	Done
Friend list with recycle view	5	Done
Retrofit research	5	Done
Basic retrofit mvvm implantation	25	Done
DAO and dependency injection	8	Done
Research spring security	5	Done
Score recycle view implementation	5	Done
Api to update profile information	3	Done
Api to get daily word	3	Done

Sprints

Each sprint we selected some of the tasks from the product backlog and added them to the current sprint's sprint backlog. Most of the sprints were 1 week long.



Sprint 1: 20.10.2019 – 22.10.2019

Planning: This sprint is shorter than the other ones, because we agreed that each Wednesday will mark the start of a new sprint, as this is the day when we get feedback from our supervisor. The goal during this sprint is to have some of the diagrams that give a better understanding for the overall system.

Sprint backlog	Story points	Status
ER diagram and description	7	Done
Package diagram	3	Done
Architecture diagram	1	Done

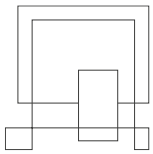
Sprint review: The objectives for this were achieved.

Sprint retrospective: We worked well together, but it was a short sprint and there were not many tasks.

Sprint 2: 23.10.2019 – 29.10.2019

Planning: For this sprint, we have to fix some of diagrams that were considered done in the previous sprint. The rest of the sprint will focus on the diagrams that could help with the architecture of the system.

Sprint backlog	Story points	Status
UI design	4	Done
Package diagram fix	0.5	Done
ER diagram description	1	Done
Architecture diagram fix	0.5	Done
Client-side class diagram	3	Done
Server-side class diagram	3	Done



Design patterns description	2	Not Implemented
Description of technologies	3	Not Implemented
Sequence diagrams	5	Not Implemented

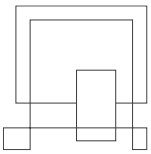
Sprint review: The fixes and majority of the diagrams were completed, the remaining tasks are close to finish, but they will have to be moved to the next sprint.

Sprint retrospective: We should dedicate more hours to the bachelor

Sprint 3: 30.10.2019 – 05.11.2019

Planning: In the previous sprint we finished most of the diagrams, so we are ready to take on some tasks that are about implementation. At first, we need the core of the app to be done and later we can extend it with everything else.

Sprint backlog	Story points	Status
Client-side class diagram fix	3	Done
Server-side class diagram fix	6	Not implemented
Design patterns description	2	Not implemented
Description of technologies	3	Not implemented
Sequence diagrams	5	Not implemented
Database implementation	5	Done
Change UI design	2	Not implemented



Menu implementation	5	Not implemented
Resources to letters	25	Not implemented
Letters to word	20	Not implemented
Giving points to the user	10	Not implemented
Setup basic API on server	25	Not implemented
Client connection to the server	15	Not implemented
Save data to the DB	5	Not implemented

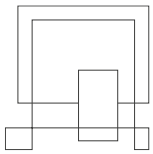
Sprint review: A most of the implementation is going nicely, but they cannot be considered done.

Sprint retrospective: Too many tasks have been included in this sprint

Sprint 4: 06.11.2019 – 12.11.2019

Planning: In the previous sprint we included way too many tasks, so most of those tasks are simply just moved to this sprint.

Sprint backlog	Story points	Status
Server-side class diagram fix	3	Not implemented
Design patterns description	2	Implemented
Description of technologies	3	Implemented
Sequence diagrams	5	Not implemented
Change UI design	2	Not implemented



Menu implementation	5	Implemented
Numbers to letters	25	Implemented
Letters to word	20	Not implemented
Giving points to the user	10	Not implemented
Client connection to the server	15	Not implemented
Setup basic API on server	25	Implemented
Save data to the DB	5	Not implemented
Game UI	5	Implemented

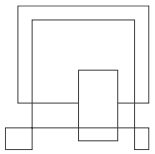
Sprint review: The implementation is going well, and we managed to squeeze in some documentation too.

Sprint retrospective: Judging sprint points needs to be improved, but distributing the tasks is going great.

Sprint 5: 13.11.2019 – 19.11.2019

Planning: Some of the implementation was missing in the previous sprint, those are added to this sprint and a few new tasks are added as well in case the previous tasks are finished, or someone needs something to do.

Sprint backlog	Story points	Status
Save data to the DB	5	Not implemented
Research Spring, JPA and DAO	10	Done
Api for single player save and retrieve	15	Not implemented
Sequence diagrams	5	Done



Implement animation	5	Done
Fixing Toolbar for fragments	3	Done
Reviewing codes	7	Done
Letters to word	20	Done
Word Validation	5	Done
Single Player Client	10	Not implemented
Friend list with recycle view	5	Not implemented

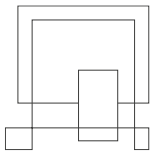
Sprint review: The core mechanics are finally done, documentation is going well, now the focus will need to be on connecting the different system parts.

Sprint retrospective: Judging the sprint points will need to be improved further.

Sprint 6: 20.11.2019 – 26.11.2019

Planning: The focus needs to be on connecting the system elements, but a few documentation elements have been added, in case we have some extra time.

Sprint backlog	Story points	Status
Save data to the DB	5	Done
Api for single player save and retrieve	15	Done
Setting menu	5	Done
Loading screen	5	Done
Friend list with recycle view	5	Done



Retrofit research	5	Done
Basic retrofit mvvm implantation	25	Not implemented
Project introduction	2	Done
Rich picture	5	Not implemented
MoSCoW prioritization	5	Done
Requirement description	1	Done
Use case Pre description	1	Done
Single Player Client	10	Done
MVC and MVVM	12	Done

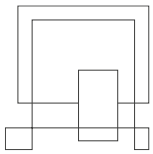
Sprint review: A lot of things can be considered done, the ones that are not finished yet are going to be moved to the next sprint.

Sprint retrospective: The tasks should be distributed a little bit better. There were members who got a lot of tasks regarding documentation and not much about implementation.

Sprint 7: 27.11.2019 – 03.12.2019

Planning: Implementing new features and we should improve the already existing code quality. Some documentation was added as well.

Sprint backlog	Story points	Status
Research spring security	5	Done
Api for login and registration	15	Done
Project Report - Domain entities	4	Done



Project Report - Domain model	4	Done
Score recycle view implementation	5	Done
Basic retrofit mvvm implantation	25	Not implemented
Rich picture	5	Done
Acronyms and abbreviations	3	Done
Choice of technologies description	1	Done
Dimensional modelling	5	Done
DAO and dependency injection	8	Done

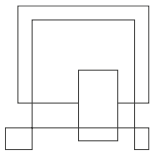
Sprint review: Almost every task has been completed, very satisfied with the results.

Sprint retrospective: Only a few more sprints left, we should include more documentation tasks.

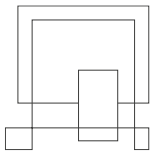
Sprint 8: 04.12.2019 – 10.12.2019

Planning: This sprint is going to be the last sprint where we are writing any code, because the next one should focus on documentation only, so every feature that we want in the system should be implemented now.

Sprint backlog	Story points	Status
Update use case documentation	4	Not Implemented



Basic retrofit mvvm implantation	25	Done
Retrofit for score management	20	Done
Scores API	20	Done
Retrofit for account management	20	Done
Account management API	15	Done
Update pattern documentation (dao, adapter)	7	Not Implemented
Api to update profile information	3	Done
Api to get daily word	3	Done
Api for friend list	8	Done
Profile for client	15	Done
Daily challenge for client	7	Done
Friend list for client	7	Done
Update ER description	1	Not Implemented
Background description	2	Done
Change rich picture	3	Done
Solid principle	3	Done
Analysis intro	1	Done
UI design documentation	3	Not Implemented
Server technologies	2	Not Implemented



Sprint review: All code related thing that had to be implemented is done, some extra documentation is done as well.

Sprint retrospective: The team did well, lot of tasks have been completed.

Sprint 9: 11.12.2019 – 20.12.2019

Planning: This is the last sprint, so it should focus entirely on the documentation. It is a little bit longer than the other sprints, because the remaining time wouldn't be enough for a normal sprint.

Sprint backlog	Story points	Status
Update use case documentation	4	Done
Update pattern documentation (dao, adapter)	7	Done
Update ER description	1	Done
UI design documentation	3	Done
Server technologies	2	Done
Implementation documentation	20	Done
Test documentation	15	Done
Revision of project report	65	Done
References, table of contents, etc	10	Done
Appendix	10	Done
Project report closing chapters	15	Done

Process report	25	Done
System features	3	Done
Small chapters	5	Done

Sprint review: Everything is done, ready to hand in.

Burndown chart