REQUIREMENTS SPECIFICATION

Contents

1. INTRODUCTION

The aim of this report is to show a detailed description of the Cannicula Campusus. Game's name coming from latin word Canicula which means in English "Dog", and fabrication word Campuses. In this document, we will describe usage scenerio, early system models and user stories. In this way, we will explain project's goal, content and organization.

1.1 Goals

The goal of the project is to develop Android game application with the aid of Unity 3D Platform. This project is game for android users. Our game encapsulate 6 different modes which are chasing cats, daily routine of a dog, running from cars in a traffic in the campus, fastest arrive of a point, daily challenge and multiplayer area wars. One of the most important aim of this project is to provide fun to our game users and have good times with their friends.

1.2 Contents and Organization of the Document

Organization of this document is as the following;

We will provide user types, use case diagram and use cases in terms of usage scenario. Moreover, we will prepare conceptual model and flow diagram for our project. Finally we will mention user stories for each component.

Explanation of the content will be found below:

- **Usage Scenerio:** A usage scenario, or scenario for short, describes a real-world example of how one or more people or organizations interact with a system. They describe the steps, events, and/or actions which occur during the interaction.
    - **User Types:** This part, we will describe list of user profiles of the software.
    - **Use Case Diagrams**: In this stage, one diagram for each software requirement will be included.
    - **Use Cases**: In this phase, a use case for each epic in our project plan also we will talk about alternative flows.

- **Early System Models:** Early models of the system that we will create, will be examined under this title.
    - **Conceptual Model:** Conceptual model made of the composition of concepts, which will be used to help people know, understand, or simulate a subject the model represents.
    - **Flow Diagram:** One diagram for each use case in use cases will be showed and we will use a flowchart.

- **User Stories:** Subsections for user stories will be created for each component in our project and will be explained in details. User stories are shown as the following;
    - Story of Chasing Cats
    - Story of the Daily Routine
    - Story of Running Cars In The Traffic
    - Story of Fastest Arrive of a Point
    - Story of Daily Challenge
    - Story of Multiplayer Area Wars

2. USAGE SCENERIO

2.1 User Types

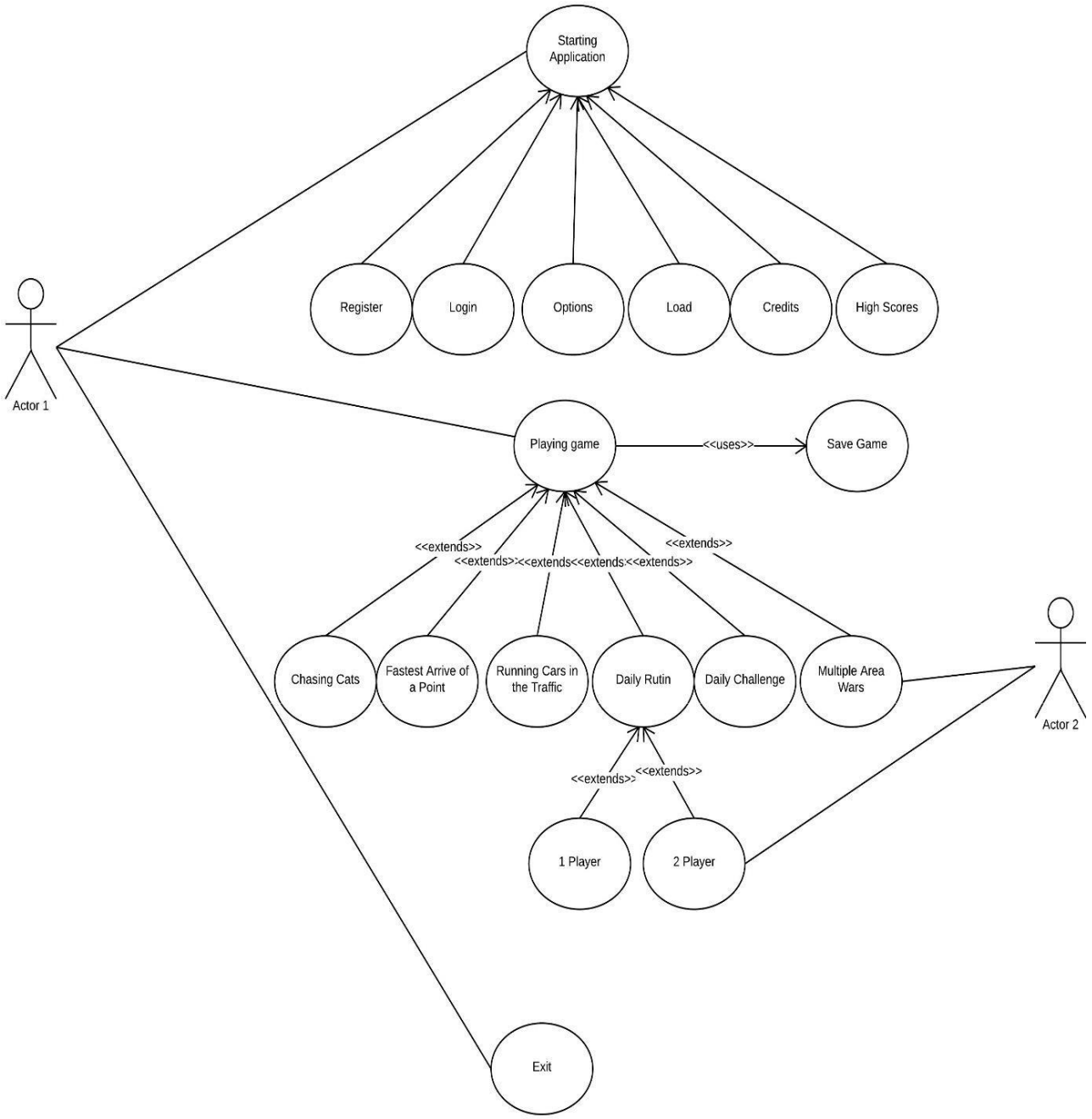
	Kids	**Objective Seekers**	**Speed Lovers**	**Daily Visitors**	**Challengers**
Single Player Mode User	+	+	+	+	-
Multiplayer Mode User	-	-	-	-	+

The terms that are used to determine the user profiles in the table are shown in the brackets near their detail explanation as below:

1. Player: Since our project is game developing, our only user type is player. Due to the our game has multiplayer option, it should considered separately.
    a. Player in Single Player Mode: It has 5 different game options to play. Each game mode corresponds for almost different player genres.
        i. Children Players(13-)(Kids): Chasing Cats and running from cars in traffic modes are suitable for 13- children. They like to chase and run after games.
        ii. Player who like to do objectives(Objective Seekers): Daily routine mode of the game is suitable for these type of players. Locally, there will be assign some objectives to the player according to the his/her experience.
        iii. Player who likes speed(Speed Lovers): Fastest arrive of a point mode of the game is for this kind of players. It contains shortest path and quick decisions.
        iv. Player who like dynamic contents(Daily Visitors)): Daily challenge mode of the game is suitable for these kind of players. In this mode, some duties are assigned to the player to be fulfill by server.
    b. Player in Multi Player Mode: It has only one game option to play. This mode of the game require network connection.

i. Player who challenge another human player(Challengers): Multiplayer mode of the game is suitable for these kind of players. Player can connect another players game, while the second player in the Daily Routine mode and has network connection, without any notice. The first player should fight with the second player and beat it. If second player can run and hide enough fast, s/he can win the competition.

2.2 Use Case Diagram



A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system. This type of diagram is typically used in conjunction with the textual use case and will often be accompanied by other types of diagrams as well.

2.3 Use Cases

In software and systems engineering, a use case is a list of steps, typically defining interactions between a role (known inUnified Modeling Language (UML) as an "actor") and a system, to achieve a goal. The actor can be a human, an external system, or time. As an important requirement technique, use cases have been widely used in modern software engineering over the last two decades.

Use Case	Register
Goal	To create a user profile
Actors	Player
Preconditions	The player must open the software
Scenarios	1- Player press “New Player” from the main menu 2- The system shows profile creation page 3- Player enters the name and password 4- The system saves the profile name and password in the directory and creates a new folder for storing user data specific to that profile
Issues	

Use Case	Log in
Goal	To log in with created account
Actors	Player
Preconditions	1- Player must open the software 2- Player must have an account
Scenarios	1- Player press “Log in” from the main menu 2- The system shows user name and password boxes 3- Player enters user name and password 4- The system takes that inputs and returns the datas of this account 5- The system returns to main menu
Issues	

Use Case	Options
Goal	To modify options of the game
Actors	Player
Preconditions	The player must open the software
Scenarios	1- Player press “Options” from the main menu 2- The system takes that input and shows Options page. 3- Player change settings such as video, sound, controls etc… 4- User press “done” when finished 5- The system takes inputs and apply them
Issues	

Use Case	Load
Goal	To load presviously saved game
Actors	Player
Preconditions	1- Player must log in 2- Player must have save file in the game directory
Scenarios	1- Player press “Load” from the main menu 2- The system shows previous saved files 3- Player locate the saved session from previous saved files 4- Player press “done” to start loading 5- The system takes that input and instantiates objects and player in it according to the previously saved data 6- The system returns the generated session
Issues	

Use Case	Save
Goal	To save players current session
Actors	Player
Preconditions	Player must be in a session
Scenarios	1- Player press specified button to open the menu 2- The system takes the keyboard input and runs the corresponding function 3- Player press “Save” from main menu 4- The system takes that selection and open the save game page 5- Player selects an available saving slot and write the name of the save file 6- Player presses “Done” button at the end

	7- System takes that input and checks whether there is a save file related to that saving slot 7.a- If there is, system asks the user whether he/she wants to overwrite old save files or not. 7.a.a - If the user selects “Yes”, system takes that input and overwrites the old save file with new values 7.a.b- If the user selects “No”, system returns to the save game window without any changes 7.b- If there isn’t a save file at that slot, system creates a new save file and stores it in the profile directory.
Issues	

Use Case	Chasing Cats
Goal	To catch the maximum number of cats
Actors	Player
Preconditions	1- Player must choose the proper game mode 2- Player must log in
Scenarios	1- Player press “Chasing Cats” from the main menu 2- The system loads to map 3- The system spawns dog and cats in suitable places, randomly 4- The system applies game constraints 5- The system starts timer. 6- Cats will be played by Artificial Intelligence 7- Player manages the dog 8- The system saves score 8.a-If player has higher score then latest highest score, it will be saved as new highest score by the system
Issues	

Use Case	Daily Routine
Goal	To do daily routine objectives
Actors	Player
Preconditions	1- If player selects multiplayer, device must have internet connection 2- Player must log in 3- Player must choose the proper game mode
Scenarios	1- Player press “Daily Routine” from the main menu 2- The system get sub menu to select player number

	2.a- If the player select “single player”, the system generate single player game 2.a.a- The system loads to map 2.a.b- The system spawns dog, friendly and enemy dogs, cats and cars in the suitable places, randomly 2.a.c- The system assigns game objectives 2.a.d- The system applies game constraints 2.a.e- Enemy and friendly dogs, cats and cars will be played by Artificial Intelligence 2.a.f- Player manages the dog 2.a.g- Dog should do some certain objective during the day 2.b-If the player select “multiplayer”, the system generate multiplayer game 2.b.a- The system loads to map 2.b.b- The system spawns dog, friendly and enemy dogs, cats and cars in the suitable places, randomly 2.b.c- The system assigns game objectives 2.b.d- The system applies game constraints 2.a.e- Friendly dogs, cats and cars will be played by Artificial Intelligence 2.b.f- Player manages the dog 2.b.g- The system connect opponent player to the game 2.b.h- Enemy dogs manage by opponent player 2.b.i- The player try to fight, run or hide from opponent players
Issues	

Use Case	Running Cars In The Traffic
Goal	To arrive the given point without any car accident
Actors	Player
Preconditions	Player must choose the proper game mode
Scenarios	1- Player press “Running Cars” from the main menu 2- The system loads to map 3- The system spawns dog and cars in suitable places, randomly 4- The system applies game constraints 5- Cars will be played by Artificial Intelligence 6- Player manages the dog
Issues	

Use Case	Fastest Arrive of a Point
Goal	To arrive the given point as fast as possible

Actors	Player
Preconditions	Player must choose the proper game mode
Scenarios	1- Player press “Fastest Arrive” from the main menu 2- The system loads to map with obstacles 3- The system spawns dog in suitable places, randomly 4- The system create arrive point in suitable place 6- The system applies game constraints 7- The system starts the timer. 8- Obstacles will move linearly 9- Player manages the dog
Issues	

Use Case	Daily Challenge
Goal	To progress with doing objectives
Actors	Player
Preconditions	1- Player must choose the proper game mode 2- Device must have an internet connection 3- Player must log in
Scenarios	1- Player press “Daily Challenge” from the main menu 2- The system connect to the server 3- The system loads to map with obstacles according to server based information 4- The system spawns dog according to server based information 5- The system creates enemies and obtacles 6- The system assigns objectives before the game start 7- The system applies game constraints 8- Enemies and obstacles will be played by Artificial Intelligence 9- Player manages the dog 10- The system shows up to date objectives by the server, during the game
Issues	

Use Case	Multiplayer Area Wars
Goal	To match two player via network
Actors	Player
Preconditions	1- Player must choose the proper game mode 2- Device must have internet connection

	3- Player must log in
Scenarios	1- Player press “Multiplayer Area Wars” from the main menu 2- The system loads to map 3- The system spawns dog, friendly and enemy dogs, cats and cars in the suitable places, randomly 4- The system activate network connection 5- The system synchronizes the map 6- The system searchs the opponent who is in the daily routine mode. 7- The system offers an opponent to the player 7.a- If player accept the offer battle will be start 7.b- If player doesn’t accept the offer, the system proposes new opponent 8- The player should attack the opponent player 8.a- If the player can kill the opponent player, the player will win 8.b- If the opponent player can kill the player, the opponent player will win 8.c- If the opponent player can hide or run from the player for a time, the opponent player will win
Issues	If one of the player exit the game or lose the network connection, enemy of this player is accepted as winner.

Use Case	Credits
Goal	To shows credits page
Actors	Player
Preconditions	The player must open the software
Scenarios	1- Player press “Credit” from the main menu 2- The system shows credit page 3- Player selects “ok” button when done 4- System takes that input and returns to the main menu
Issues	

Use Case	High Scores
Goal	To show high scores until then
Actors	Player
Preconditions	The player must open the software
Scenarios	1- Player press “High Scores” from the main menu 2- The system shows high score page 3- Player selects “ok” button when done

	4- System takes that input and returns to the main menu
Issues	

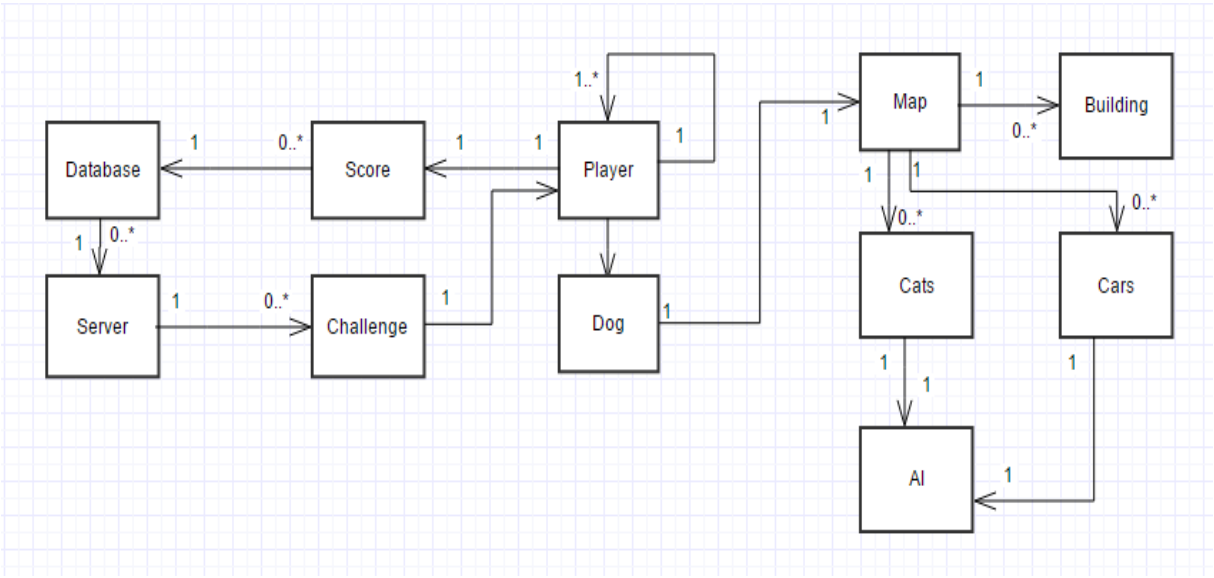
Use Case	Exit
Goal	To exit from the game
Actors	Player
Preconditions	The player must open the software
Scenarios	1- Player press “Exit” from the main menu 2- The system takes that input and terminates the game
Issues	Asking if user wants to save when user prompts exit while playing the game

3. EARLY SYSTEM MODELS

3.1 Conseptual Model

In software engineering, an entity-relationship model (ERM) is an abstract and conceptual representation of data. Our conceptual model is a model made of the composition of concepts, which are used to help people know, understand, or simulate a subject the model represents.

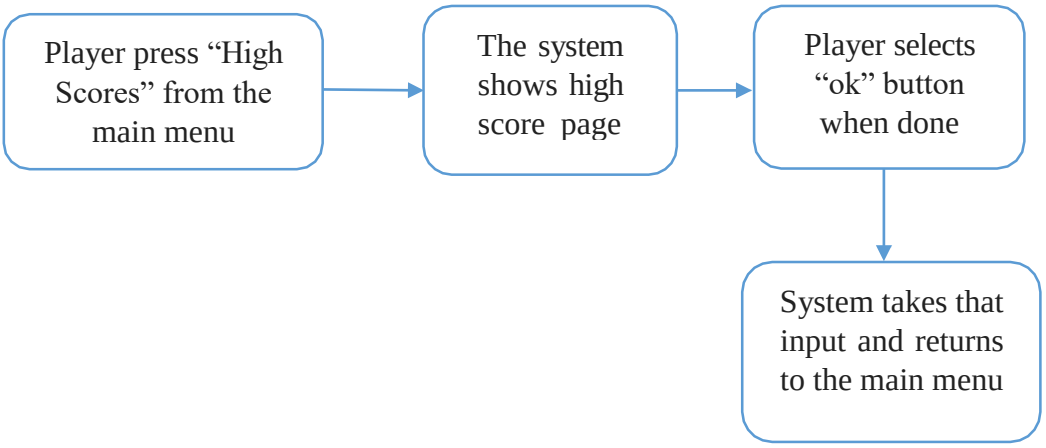
Online flowchart tool which is called Gliffy was used while creating this coseptual model which can be found below:



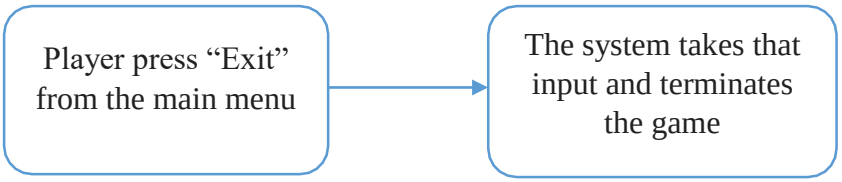
Conseptual Model

3.2 Flow Diagrams

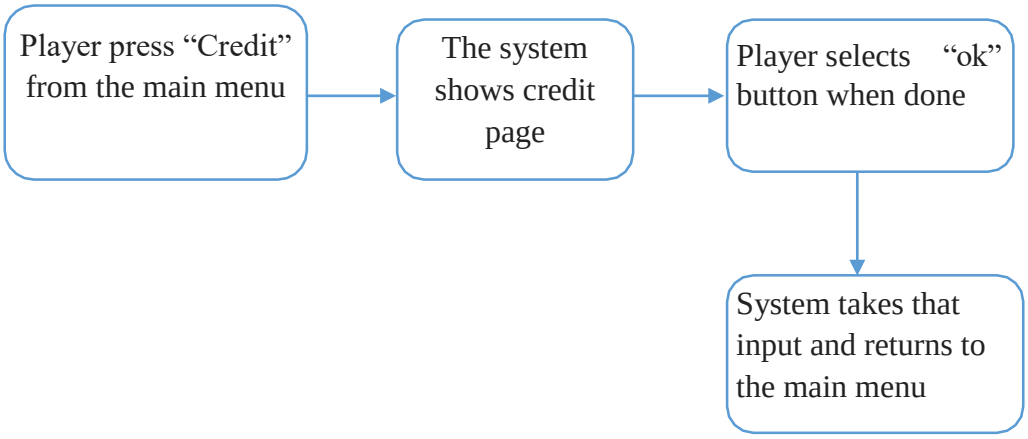
High Scores:



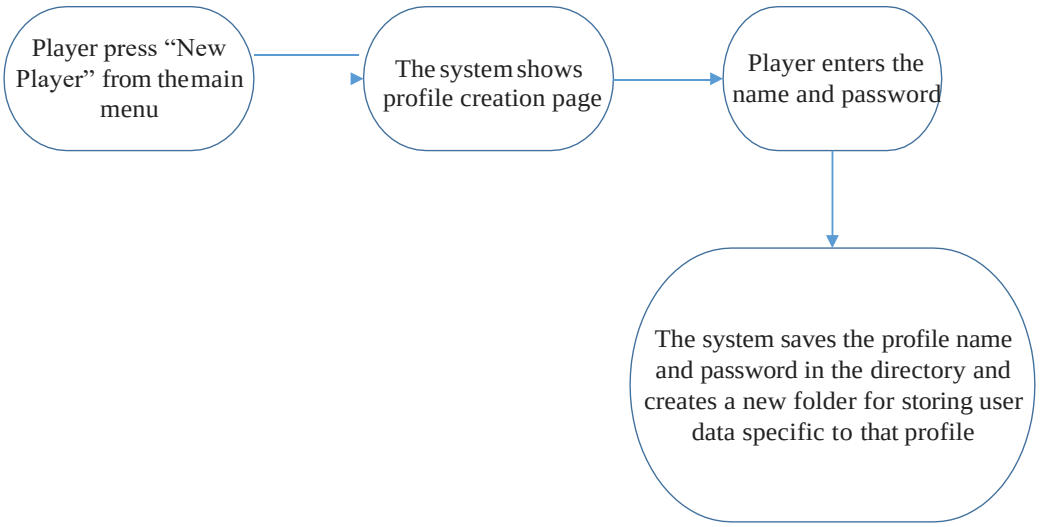
Exit:



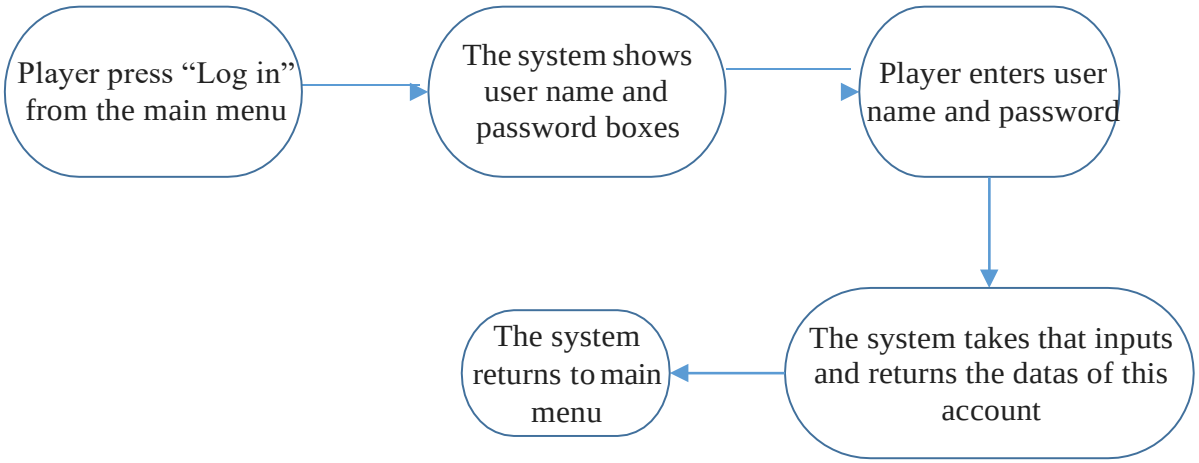
Credits:



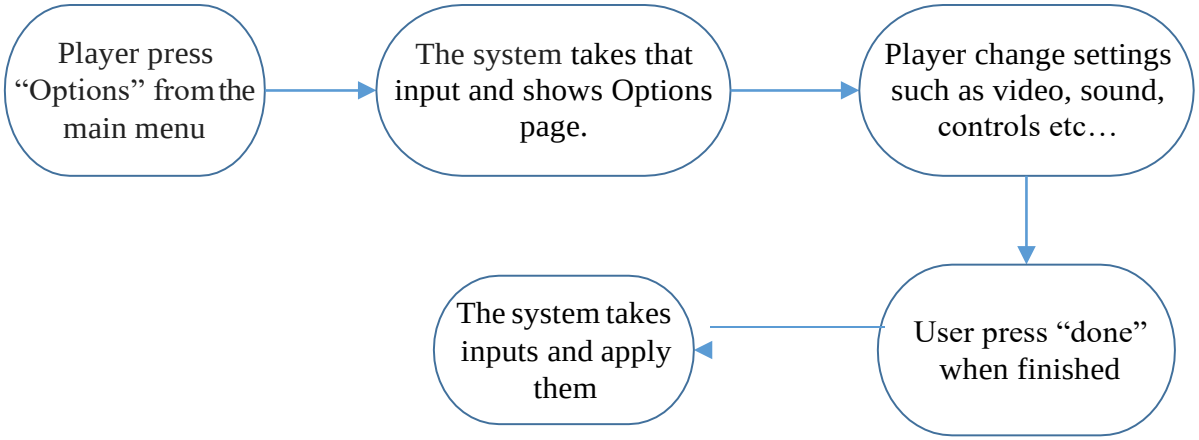
Register:



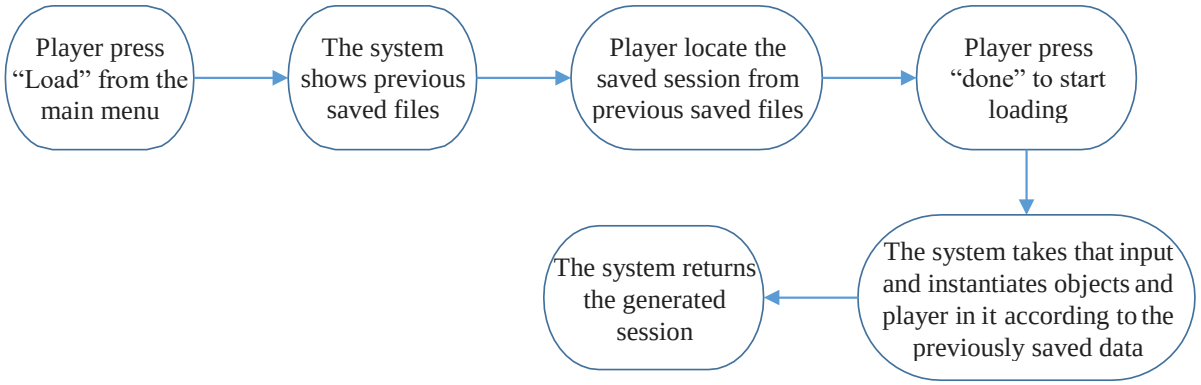
Log in:



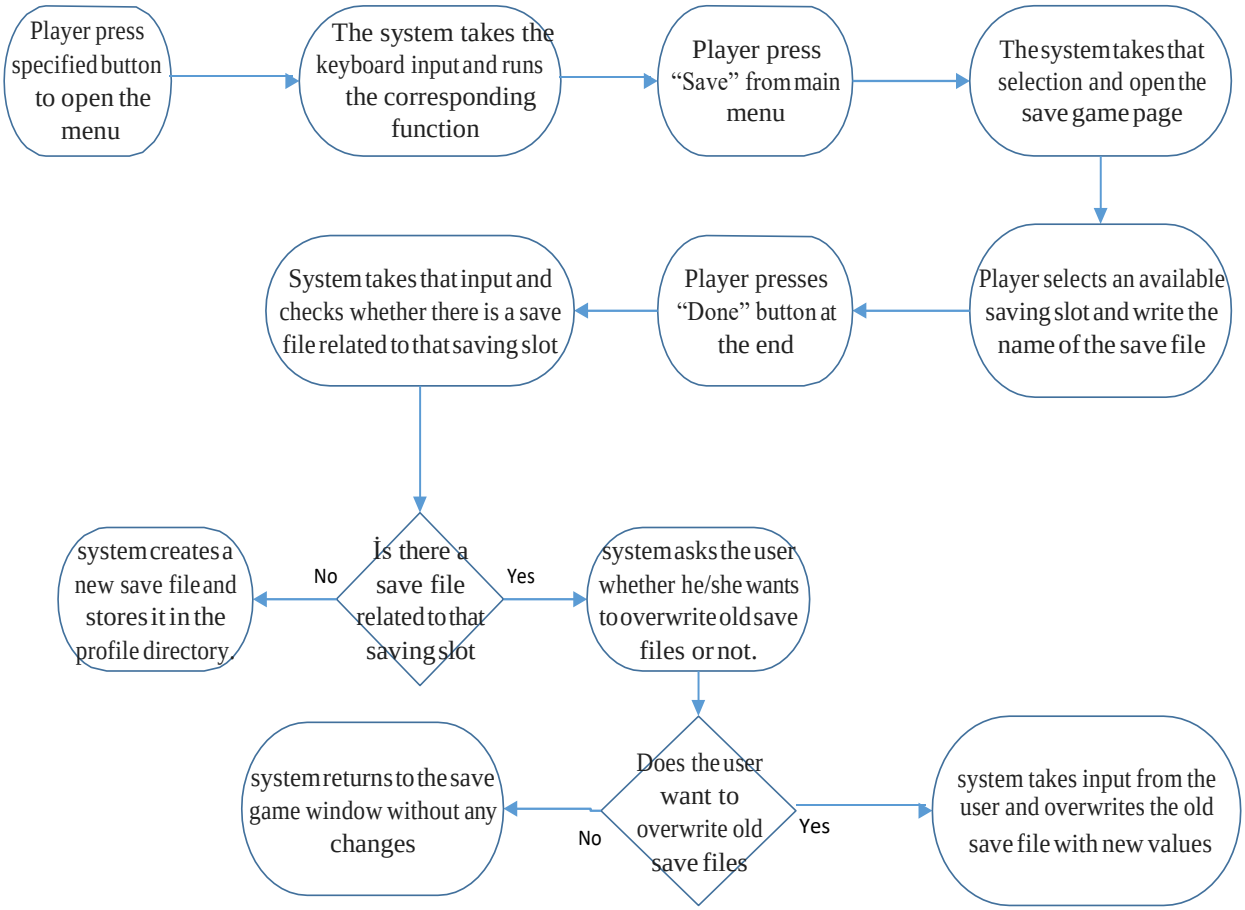
Options:



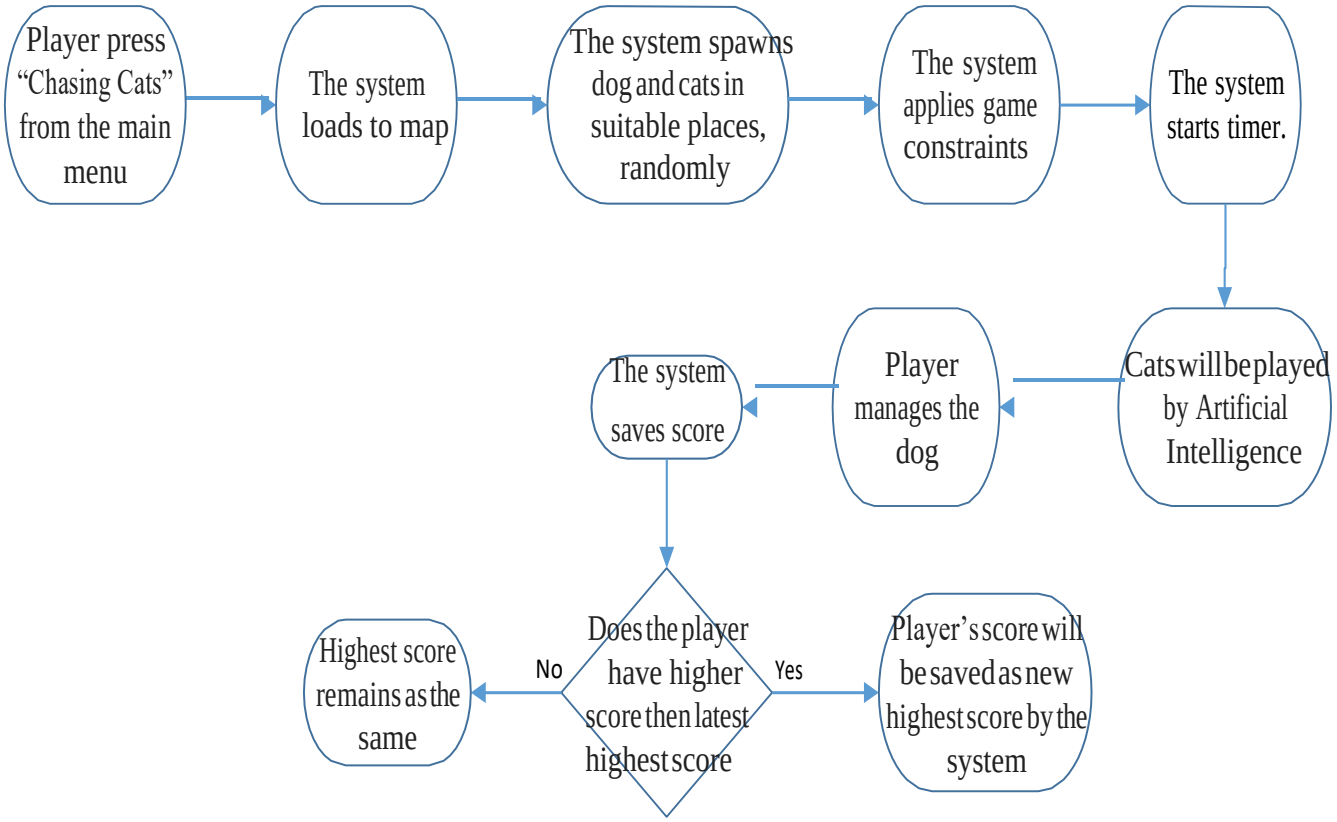
Load:


Player press "Load" from the main menu
The system shows previous saved files
Player locate the saved session from previous saved files
Player press "done" to start loading
The system takes that input and instantiates objects and player in it according to the previously saved data
The system returns the generated session

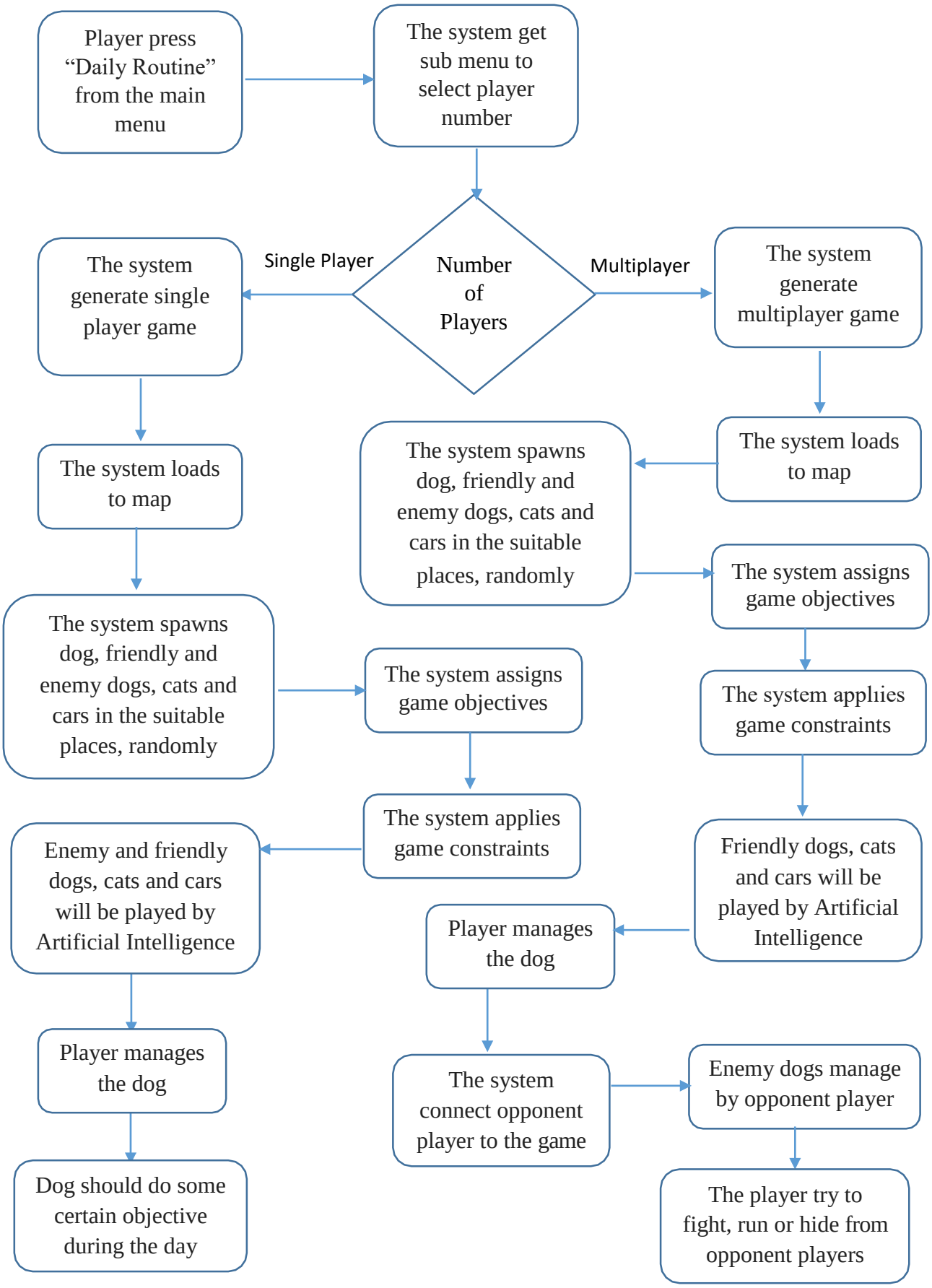
Save:


Player press specified button to open the menu
The system takes the keyboard input and runs the corresponding function
Player press "Save" from main menu
The system takes that selection and open the save game page
Player selects an available saving slot and write the name of the save file
Player presses "Done" button at the end
System takes that input and checks whether there is a save file related to that saving slot
İs there a save file related to that saving slot
No
Yes
system creates a new save file and stores it in the profile directory.
system asks the user whether he/she wants to overwrite old save files or not.
Does the user want to overwrite old save files
No
Yes
system returns to the save game window without any changes
system takes input from the user and overwrites the old save file with new values

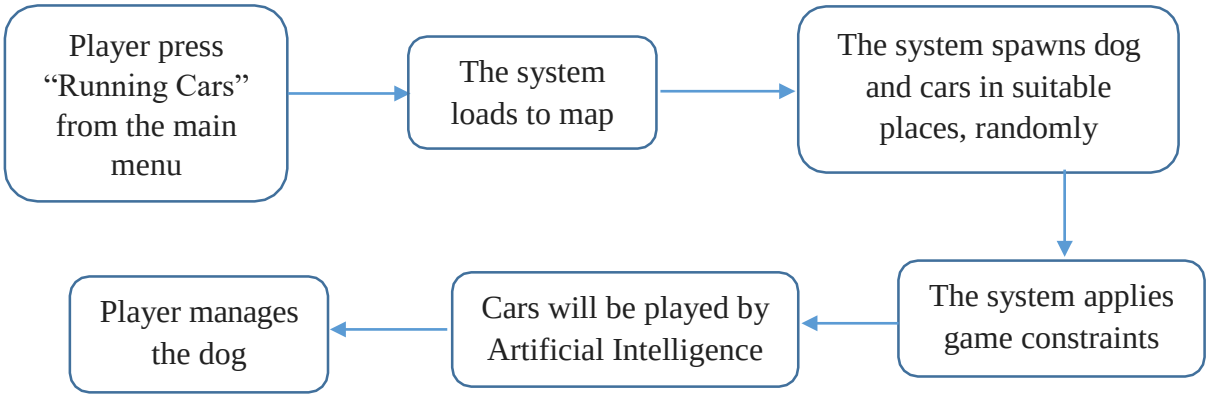
Chasing Cats:



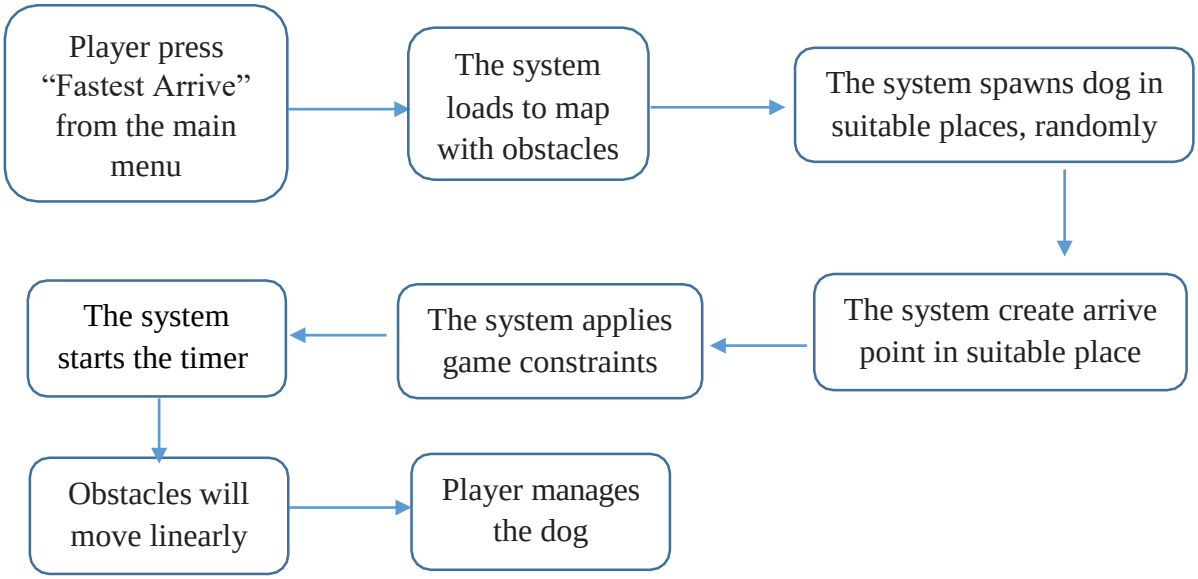
Daily Routine:



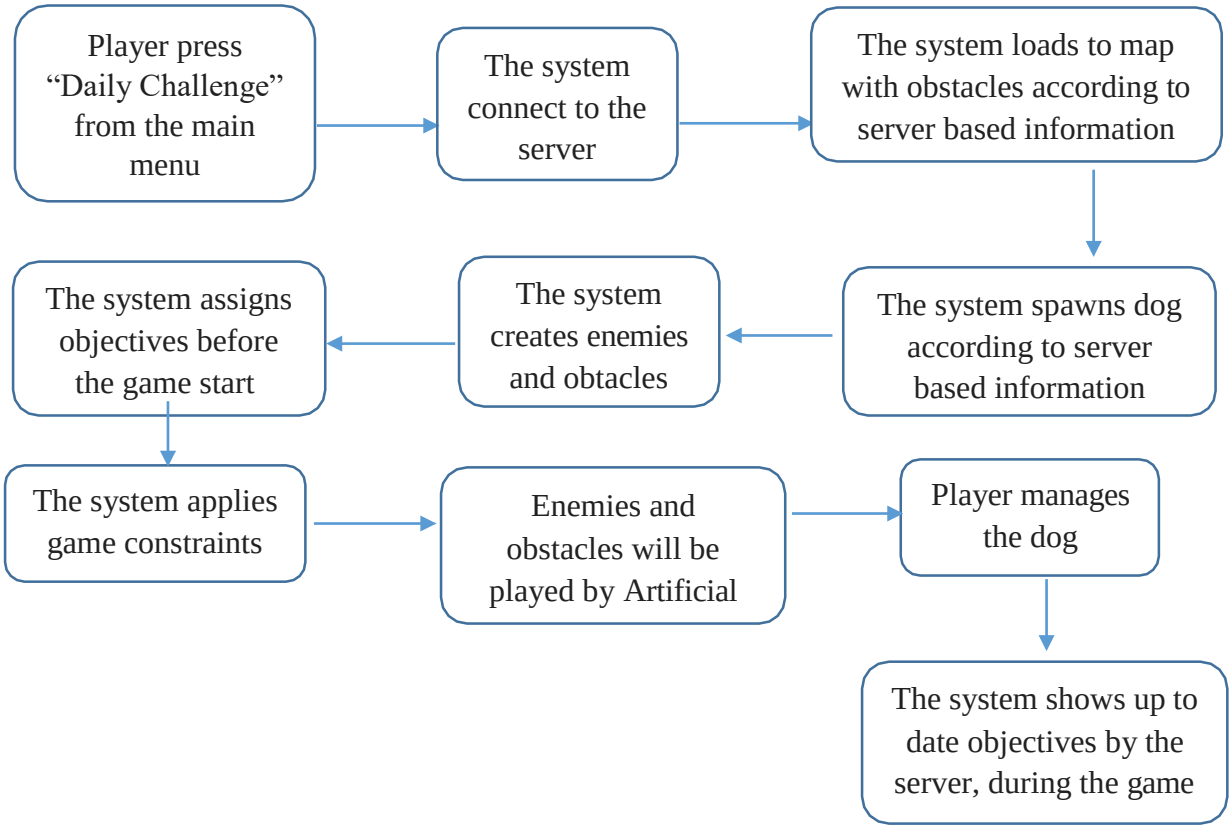
Running Cars In The Traffic:



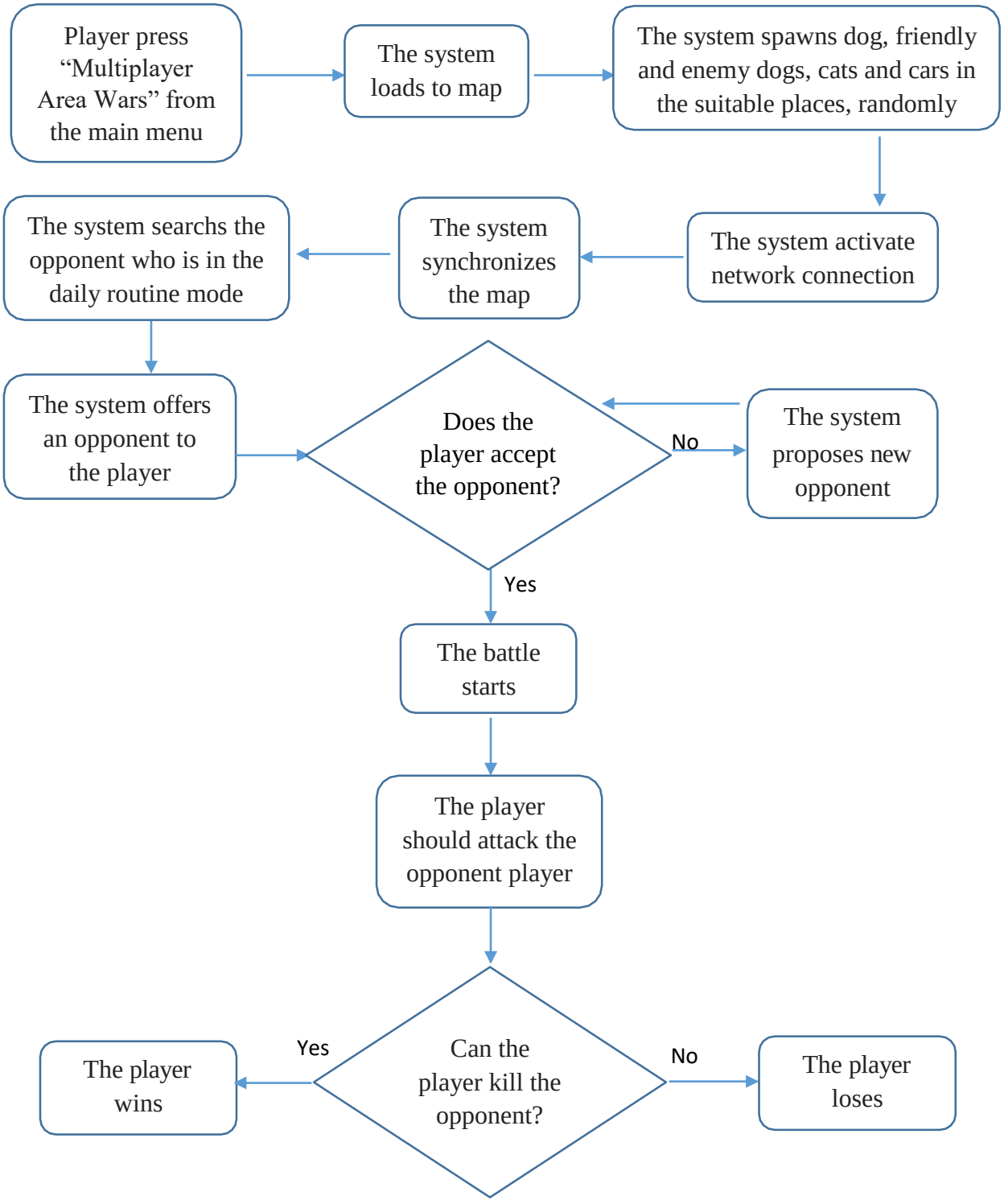
Fastest Arrive of a Point:



Daily Challenge:



Multiplayer Area Wars:



4. USER STORIES

	Feature	Preconditions	Actions
Chasing Cats	Catch, High Score	Map Loading, Objects Generation	AI, Collision Control
Daily Routine Single Player	Daily Tasks, Point System	Map Loading, Objects Generation, Single Player	AI, Collision Control
Daily Routine Multiplayer	Daily Tasks, Point System	Map Loading, Objects Generation, Multiplayer, Internet Connection	Player Interactions, AI, Collision Control
Running Cars in the Traffic	Reaching Destination	Map Loading, Objects Generation	AI, Collision Control
Fastest Arrive of a Point	Obstacle Avoidance	Suitable Destination, Map Loading, Objects Generation	AI, Collision Control
Daily Challenge	Up to Date Challenges	Map Loading, Objects Generation, Internet Connection	Instant Objectives, AI, Collision Control, Player Interactions,
Multiple Area Wars	Player Match	Map Loading, Objects Generation, Multiplayer, Internet Connection	Player Interactions, AI, Collision Control

The terms that are used in the user stories table are explained in detail as below. Each row represents the subtitles of this user stories section, each column indicates itemized explanation of these subtitles.

4.1 Story of Chasing Cats

- **Feature:**
  - In a given time dog is supposed to catch the maximum number of cats it can catch.
  - End of the every game, score is saved and if player has higher score then latest highest score, it will be saved as new highest score.
- **Scenario:**
  - **Preconditions:**
    - Predefined map will be loaded when this mode of the game started.
    - Dog and cats will be spawned in suitable places in the map randomly.
    - Game constraints will be applied after all of these preconditions are set.
  - **Actions:**
    - Cats will be played by Artificial Intelligence.
    - Artificial Intelligence will determine the next move and speed of the cats, according to the dog's current coordination and the buildings in the map.
    - Dog will be played by Player. Player can not move into buildings.

4.2 Story of the Daily Routine

- **Feature:**
  - Player should do every day some routine objectives such that, walking, running, eating.
  - In daily routines the tasks' difficulties will be assign by player's experience.
  - If player don't play this mode of the game every day at least one time, the points of the player will be decrease.
- **Scenario-1:**
  - **Preconditions:**
    - Single Player is activated
    - Predefined map will be loaded when this mode of the game started.
    - Dog, enemy and friendly dogs, cats and cars will be spawned in suitable places in the map randomly.
    - Game objectives will be assign before the game start.
    - Game constraints will be applied after all of these preconditions are set.
  - **Actions:**
    - Enemy and friendly dogs, cats and cars will be played by Artificial Intelligence.
    - Artificial Intelligence will determine the next move of enemy and friendly dogs, cats and cars according to each others locations, player's dog's location and the building in the map.
    - Dog will be played by Player. Player can not move into buildings.
    - Dog should do some certain objective during the day. Objectives will be divisible.
- **Scenario-2:**
  - **Preconditions:**
    - Multiplayer is activated
    - Predefined map will be loaded when this mode of the game started.
    - Dog, enemy and friendly dogs, cats and cars will be spawned in suitable places in the map randomly.
    - Game objectives will be assign before the game start.
    - Game constraints will be applied after all of these preconditions are set.
    - Enemy player connect to the player's game.
  - **Actions:**
    - First player (player who in the daily routine mode.) can run from the second player (player who in the multiplayer mode.).
    - First player can hide from the second player.
    - First player can fight with the second player.

4.3 Story of Running Cars In The Traffic

- **Feature**:
  - Dog should arrive one point the given location without has any car accident.
- **Scenario:**
  - **Preconditions:**
    - Predefined map will be loaded when this mode of the game started.
    - Dog and cars will be spawned in suitable places in the map randomly.
    - Game constraints will be applied after all of these preconditions are set.
  - **Actions:**
    - Cars will be played by Artificial Intelligence.

        - Artificial Intelligence will determine the next move and speed of the cars, according to the dog's current coordination, the buildings in the map and the road.
        - Dog will be played by Player. Player can not move into buildings.

4.4 Story of Fastest Arrive of a Point

- **Feature:**
    - In this game mode, player should avoid the obstacles like cars, buildings and reach the pre-defined point as fast as possible.
- **Scenario:**
    - **Preconditions:**
        - Predefined map with obstacles will be created when this mode of the game started.
        - Dog will be spawned in suitable start place in the map.
        - Arrive point will be created suitable place according to the users level.
        - Game constraints will be applied after all of these preconditions are set.
    - **Actions:**
        - Cars will be played by Artificial Intelligence.
        - Artificial Intelligence will be basic and obstacles will move linearly.
        - Dog will be played by Player. Player can not move through the buildings and the cars.

4.5 Story of Daily Challenge

- **Feature:**
    - Players can request a new challenge after they completed the current one that is assigned to them.
    - In daily challenges, the tasks will be assigned to a player according to their experience by a server.
    - Players will be totally free to decide to play this mode or not.
    - Players will be challenged in terms of their level.
- **Scenario:**
    - **Preconditions:**
        - Map will be generated according to the server based information when this mode of the game started.
        - Dog will be spawned according to the server based information.
        - Enemy and obstacles will be created to challenge the dog in this mode.
        - Game objectives will be assigned before the game start.
        - Game constraints will be applied after all of these preconditions are set.
    - **Actions:**
        - Enemies and obstacles will be played by Artificial Intelligence.
        - Objectives of a challenge will be displayed
        - Obstacles will stay in constant places and the enemies will be controlled by artificial intelligence. Artificial Intelligence will challenge the player with the aid of the given challenge. Locations of the enemies will be determined by the artificial intelligence.
        - Dog will be played by Player. Player can not move through the buildings and obstacles.
        - Dog should do some up-to date objectives that are given by server. Objectives will be displayed to the player.

4.6 Story of Multiplayer Area Wars

- Feature:
    - First player who is in this mode, should beat the second player who is in the daily routine mode, in a certain time.
    - If second player can beat the first player, second player will win.
    - If second player run from the first player, second player will win.
    - If second player hide from the first player, second player will win.
    - If one of the player exit the game or lose the network connection, enemy of this player is accepted as winner.
- Scenario:
    - Preconditions:
        - Predefined map will be loaded when this mode of the game started.
        - Dog, enemy and friendly dogs, cats and cars will be spawned in suitable places in the map randomly.
        - Network connection should be active.
        - Suitable enemy player should be available.
        - Game map should be synchronized.
    - Actions:
        - First player can beat the second player.
        - First player can chase the second player.
        - Second player can run from the first player.
        - Second player can hide from the first player.
        - Second player can hide from the first player.
        - Second player can attack and beat to the first player.