# GIT Department of Computer Engineering
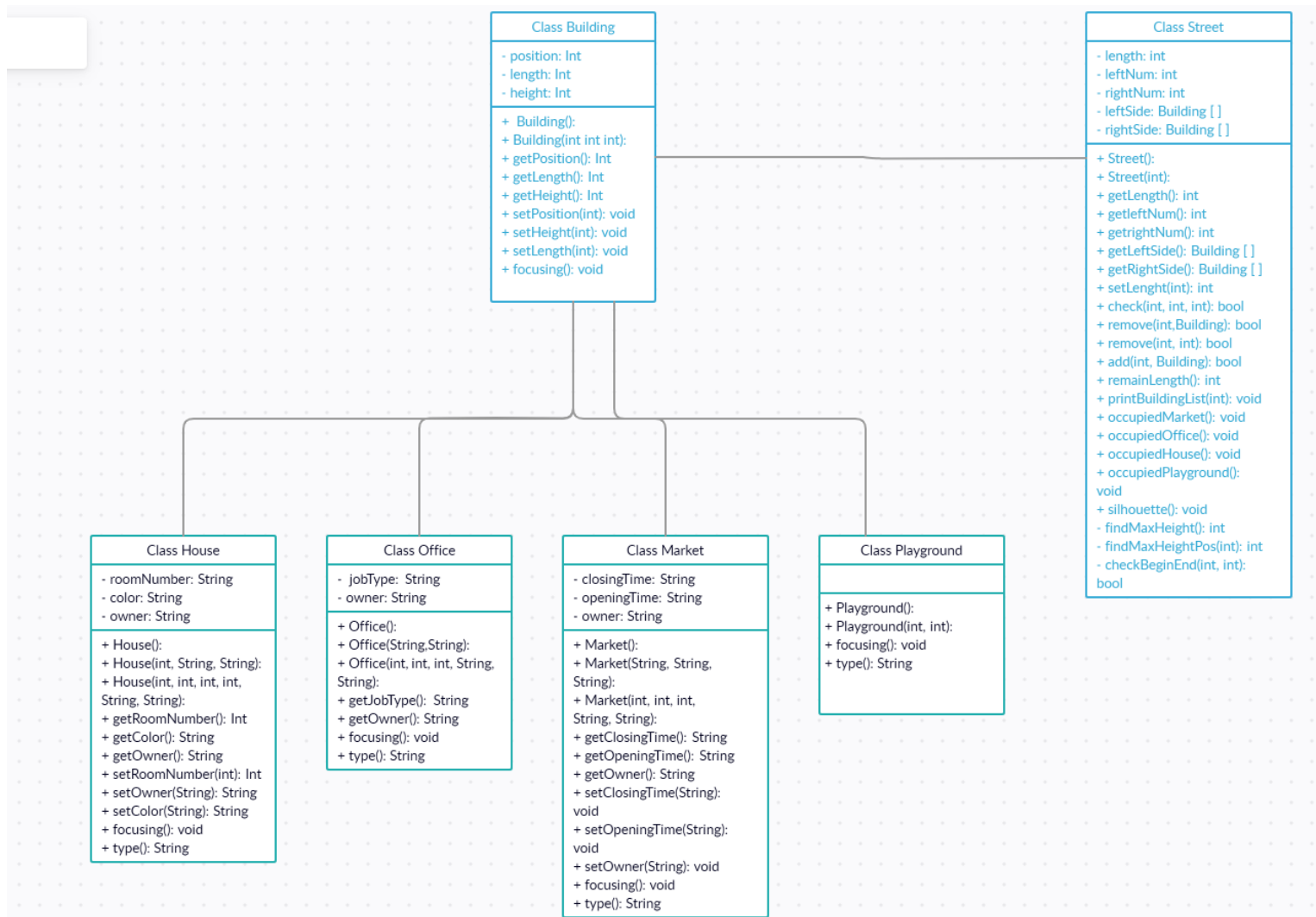# CSE 222/505 - Spring 2022
# Homework # Report

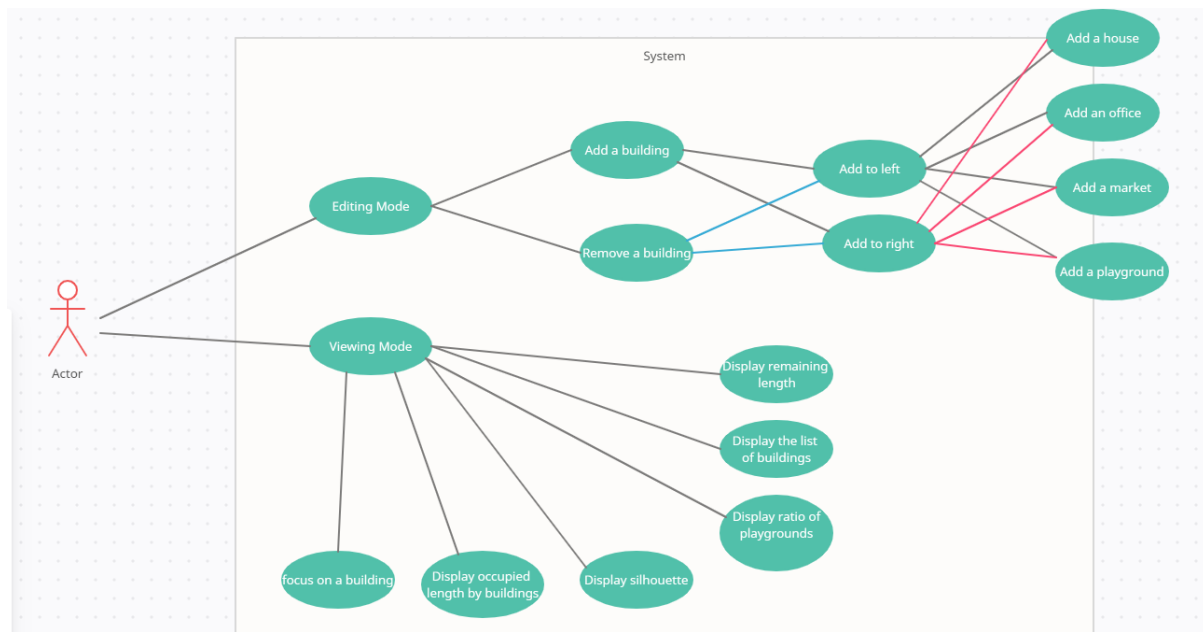## Emre YILMAZ
## 1901042606

## 1. SYSTEM REQUIREMENTS

The system is a street design program. Street must have 2 side (left-right) and the user can set the length at the beginning of the program. At the beginning of the program, there is no building in the street. There are 4 building type. User can add any of these four building types to any side of the street and can set the properties of those buildings. Buildings can have common and distinctive features. In addition to add/remove process, the user can access some information such as the remaining free land, the land occupied by the buildings, the properties of the buildings etc. User can display the skyline silhouette of the street.

## USE CASE AND CLASS DIAGRAMS

Class Diagram:

### Class Building

- position: Int
- length: Int
- height: Int

+ Building():
+ Building(int int int):
+ getPosition(): Int
+ getLength(): Int
+ getHeight(): Int
+ setPosition(int): void
+ setHeight(int): void
+ setLength(int): void
+ focusing(): void

### Class Street

- length: int
- leftNum: int
- rightNum: int
- leftSide: Building [ ]
- rightSide: Building [ ]

+ Street():
+ Street(int):
+ getLength(): int
+ getleftNum(): int
+ getrightNum(): int
+ getLeftSide(): Building [ ]
+ getRightSide(): Building [ ]
+ setLenght(int): int
+ check(int, int, int): bool
+ remove(int,Building): bool
+ remove(int, int): bool
+ add(int, Building): bool
+ remainLength(): int
+ printBuildingList(int): void
+ occupiedMarket(): void
+ occupiedOffice(): void
+ occupiedHouse(): void
+ occupiedPlayground(): void
+ silhouette(): void
- findMaxHeight(): int
- findMaxHeightPos(): int
- checkBeginEnd(int, int): bool

### Class House

- roomNumber: String
- color: String
- owner: String

+ House():
+ House(int, String, String):
+ House(int, int, int, int, String, String):
+ getRoomNumber(): Int
+ getColor(): String
+ getOwner(): String
+ setRoomNumber(int): Int
+ setOwner(String): String
+ setColor(String): String
+ focusing(): void
+ type(): String

### Class Office

- jobType: String
- owner: String

+ Office():
+ Office(String,String):
+ Office(int, int, int, String, String):
+ getJobType(): String
+ getOwner(): String
+ focusing(): void
+ type(): String

### Class Market

- closingTime: String
- openingTime: String
- owner: String

+ Market():
+ Market(String, String, String):
+ Market(int, int, int, String, String):
+ getClosingTime(): String
+ getOpeningTime(): String
+ getOwner(): String
+ setClosingTime(String): void
+ setOpeningTime(String): void
+ setOwner(String): void
+ focusing(): void
+ type(): String

### Class Playground

+ Playground():
+ Playground(int, int):
+ focusing(): void
+ type(): String

Case Diagram



## 2. OTHER DIAGRAMS

No need in this homework

## 3. PROBLEM SOLUTION APPROACH

In this assignment, we were asked to design a street where buildings can be added and removed to it, and the properties of the buildings it owns can be displayed. Since there are 2 sides to the street, I created a class called **Street** and defined 2 classic Java arrays. I have also created a class called **Building** to represent generic buildings. One of the arrays in the **Street** class was set up as the **Building** type to hold the buildings on the left and the other was set up to hold the buildings on the right.

When adding a new building to one of these arrays, it was first checked for the validness of the input and checked that it coincided with another building. During the addition process, buildings were added to the end of the arrays. I have defined 4 custom classes of the building name type such as **House**, **Office**, **Market** that inherit the **Building** class. Thus, buildings with appropriate parameters in specific building types such as **House** and **Office** could be added to the street. After these operations, viewing operations in PDF have become very easy. However, the silhouette extraction function was challenging for this

assignment. In the Street class, during the top-down silhouette extraction process, many private auxiliary functions were used, such as the function that calculates longest height in a specific position, function to find out if a position is at the top of the position where it is located, functions to find out if a position is the starting or ending position of any building etc.

### 4. TEST CASES

- Firstly, 2 House, 2 Office, 2 Market and 1 Playground objects are created.
- The position first House object is set as -3. It is an invalid value and the program warns us.
- First Office (that is named office1) and the second Market (that is named market2) are set to coincide with other buildings. Again, the program warns us about coinciding and does not the add the buildings to arrays
- It is printed that the total remaining length in the street It is printed .
- Buildings on the left side and buildings on the right side are printed with their position information separately.
- Total length on the street that is occupied by buildings is printed for each different Building types.
- Number of playgrounds and its ratio  to the street are printed.
- Some focusing methods are tested.
- Then, printed the silhouette of the street.
- Removed an element from the building array.
- Then, it is printed the silhouette of the array, again.
- **Finally**, a menu appears for user. You can try all the function yourselves. You can reach the view and edit menu, you can check their all the operations.
- In the interactive test where the user uses the menu, all inputs have been checked with exception handling.

## 5. RUNNING AND RESULTS



```
emre@emre-VirtualBox:~/Desktop/hw1$ javac Driver.java
emre@emre-VirtualBox:~/Desktop/hw1$ java Driver
Street object has been created.
Length of the street is set as 100 m.

****************************************** Creating and trying to add the building objects to street ******************************************

house0 object is created. Trying to add the object to left side of the street
There is no land for your adding process! Try another building.

house1 object is created. Trying to add the object to left side of the street
Adding process is done successfuly!

office1 object is created. Trying to add the object to left side of the street
There is no land for your adding process! Try another building.

office2 object is created. Trying to add the object to left side of the street
Adding process is done successfuly!

market1 object is created. Trying to add the object to left side of the street
Adding process is done successfuly!

market2 object is created. Trying to add the object to left side of the street
There is no land for your adding process! Try another building.

playground1 object is created. Trying to add the object to left side of the street
Adding process is done successfuly!

****************************************** streeting viewing functions ******************************************

Remaning length on the left side of the street: 80 m
Remaning length on the right side of the street: 75 m
Remaning total length of the street: 155 m

Buildings on the left side:
House (beginning position: 0)
Office (beginning position: 35)

Buildings on the right side:
Market (beginning position: 5)
Playground (beginning position: 41)

Total length on the left side of the street occupied by Houses is: 10
```



```
Total length on the left side of the street occupied by Houses is: 10
Total length on the right side of the street occupied by Houses is: 0
Total length on the street occupied by Houses is: 10

Total length on the left side of the street occupied by Markets is: 0
Total length on the right side of the street occupied by Markets is: 15
Total length on the street occupied by Markets is: 15

Total length on the left side of the street occupied by Offices is: 10
Total length on the right side of the street occupied by Offices is: 0
Total length on the street occupied by Offices is: 10

Number of total playgrounds is: 1
Ratio of the playgrounds to the Street is: %10.00

The job-type of this office is Engineering

The closing time of this market is 21.00


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****************************************** Removing an object from the street ******************************************

Removing process is done successfuly!
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***************************** Removing an object from the street *****************************

Removing process is done successfuly!


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Welcome to GTU Street. Please select the mode:
1. Viewing Mode
2. Editing Mode

Your selection:
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```
Welcome to GTU Street. Please select the mode:
1. Viewing Mode
2. Editing Mode

Your selection: 2

1. Add a building
2. Remove a building

Your selection: 1

Which side do you want to add a building?
1. Left
2. Right1

What building type do you want to add ?
1. House
2. Office
3. Market
4. Playground

Your selection: 2

Enter the position: 55
Enter the length: 15
Enter the height: 20
Enter the job type: engineer
Enter the owner: emre

Adding process is done successfuly!


Welcome to GTU Street. Please select the mode:
1. Viewing Mode
2. Editing Mode

Your selection: 1

1. Display the total remaining length of lands on the street
2. Display the list of buildings on the street
3. Display the number and ratio of lenth of playgrounds in the street.
4. Calculate the total length of street occupied by the markets, houses or offices
5. display the skyline silhouette of the street
6. EXIT

Your selection: 5
```

Adding process is done successfuly!


Welcome to GTU Street. Please select the mode:
1. Viewing Mode
2. Editing Mode

Your selection: 1

1. Display the total remaining length of lands on the street
2. Display the list of buildings on the street
3. Display the number and ratio of lenth of playgrounds in the street.
4. Calculate the total length of street occupied by the markets, houses or offices
5. display the skyline silhouette of the street
6. EXIT

Your selection: 5


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Welcome to GTU Street. Please select the mode:
1. Viewing Mode
2. Editing Mode

Your selection: