GIT Department of Computer Engineering

CSE 222/505 - Spring 2022

Homework #1 Report

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1. SYSTEM REQUIREMENTS

This is a city planning software that will be used for designing a small one street town.
We can create our town with Streets.
So first, we need to have Street objects to hold the buildings.

```
public Street(int userLength)
```

To create a street object, we should give the length of the street as parameter.

```
Street mainStreet = new Street(50);
```

We can create a Street object like this with a given length parameter.

User can add a building to the street. User can delete any building on the street.

```
public void addBuilding(Building newBuilding)
```

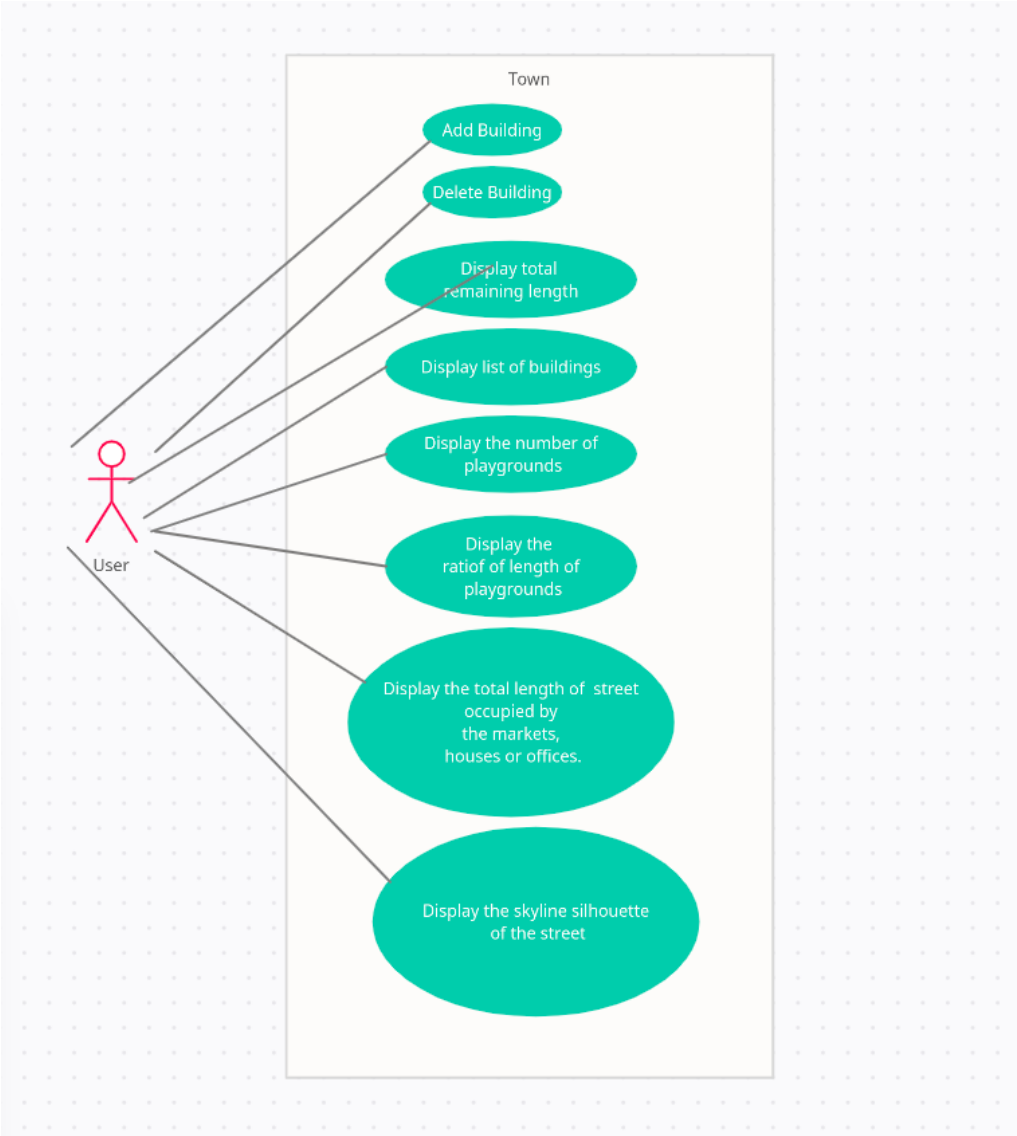
To add building to the street, building object should be given as parameter.

```
public void deleteBuilding(int index)
```

To delete a building on the street, index of the building should be given as parameter

User has 2 modes:
1: Edit mode, which user can add or delete building,
2: View mode, which user can display information about streets

2. USE CASE AND CLASS DIAGRAMS



3. PROBLEM SOLUTION APPROACH

We are asked to design and and implement a city planning software
that will be used for designing a small street town.

There would be a market, house, playground and office in this town.

My biggest problem was how to design the class hierarchy.
Must have classes were Market class, House class, Office class and Playground class.
These classes have common properties like position, height and length.
For code reusability, I know that I had to use Inheritance.
After long time of thinking, finally I decided to create a base class called "Building".
This base class was going to keep the common features of home, office , market and playground.
Eventually, I did the implementations of the "Building" class.
Everything was working perfectly.

Second problem was, how to combine these buildings to create one big town.
Then I decided to have an independent street class.
This class was going to hold all buildings in the town.
This class also contains methods like adding and removing buildings.
Finally, I created a class named "Street" to hold all buildings.
I did most of the implementations about town in the street class.
Printing skyline silhouette of the street is done in the street class.

4. TEST CASES

Create a Street

```
Street mainStreet = new Street(50);
```

Create a Building Object (House, Office, Market, Playground)

```
House house = new House(1, 10, 15, "Right", 3, "Yellow", "Serhat", 100);
```

Add Buildings to the Street

```
mainStreet.addBuilding(house);
```

Delete Building From the Street

```
mainStreet.deleteBuilding(2);
```

Display the skyline silhouette of the street

```
mainStreet.printStreet();
```

Display the total remaining length of lands on the street

```
mainStreet.printRemainingLength();
```

Display the number and ratio of lenth of playgrounds in the street

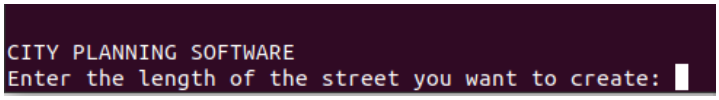
```
mainStreet.printPlaygroundInfo();
```

Total length of street occupied by the markets, houses or offices.

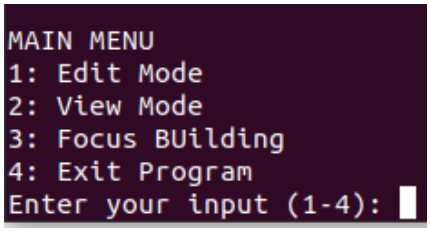
```
mainStreet.printTotalLengths();
```

5. RUNNING AND RESULTS

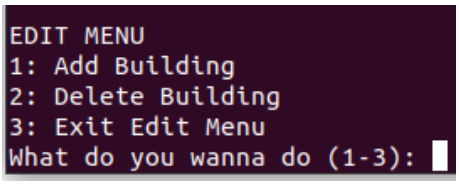
Create a Street



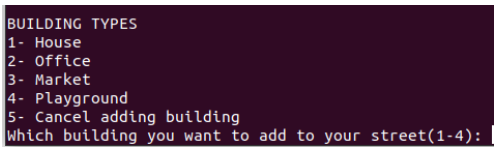
Main Menu



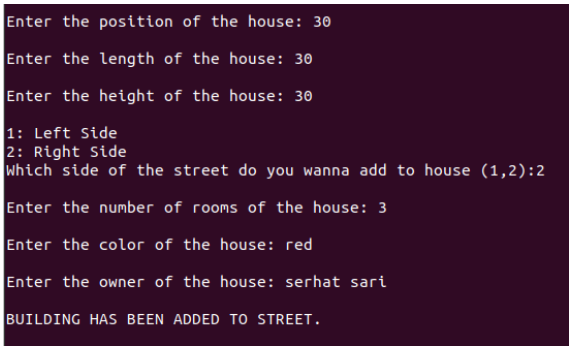
Edit Menu



Choose building type to add



Add Building



Delete Building

```
LIST OF BUILDINGS
1: Type = House, Street Side = Right, Position = 30

Enter the number of the building to delete: 1
```

View Menu

```
VIEW MENU
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 View Menu
What do you wanna do (1-6):
```

Display remaining length

```
Remaining Length: 78
```

Display the list of the buildings

```
1.BUILDING:

HOUSE INFO:
Position: 2
Length: 2
Height: 12
Street Side: Right
Number of Rooms: 3
Color: red
Owner: serhat
```

Display the number and ratio of playgrounds

```
Number of playgrounds: 1
Ratio of lenth of playgrounds in the street: 0.15
```

Display the total lenghts of the buildings

```
TOTAL LENGTHS
Total Length of Markets: 0
Total Length of Houses: 2
Total Length of Offices: 0
```

Display the skyline silhouette of the street

```
Skyline silhouette of the street

 *************
 *           *
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 *           *
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########################################
```

Focus Building

```
LIST OF BUILDINGS
1: Type = House, Street Side = Right, Position = 2
2: Type = Playground, Street Side = Right, Position = 1

Which building do you want to focus on: 1

Focusing on house:
Owner of the house: serhat
```