

**GIT Department of Computer Engineering
CSE 222/505 - Spring 2022
Homework 1 Report**

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1. SYSTEM REQUIREMENTS

There must be Street created before User. User must be enter the length of the street. Length of the building is must be valid.

Another requirement is the building. Building must be unique according to its location. No building should in same location. The building must be within the street length.

The building array memory is increased by twice if the array's capacity is full. And if the total building number is equal to quarter of capacity, the array capacity is decreased half.

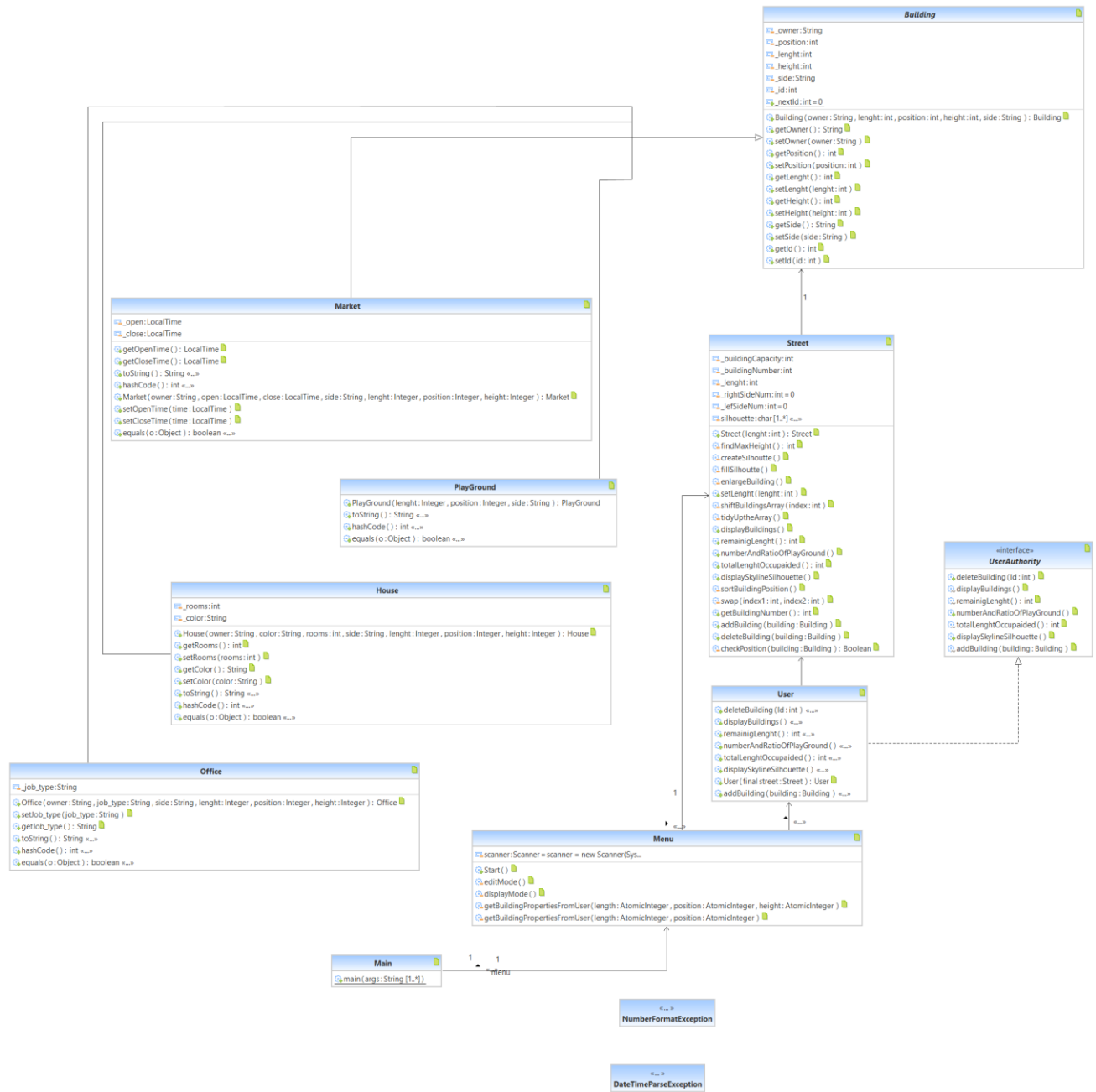
OS requirements:

Operating System should have openjdk 11.0.13 2021-10-19 LTS or above and Jre for OpenJDK Runtime Environment Corretto-11.0.13.8.1 (build 11.0.13+8-LTS) or above to run program.

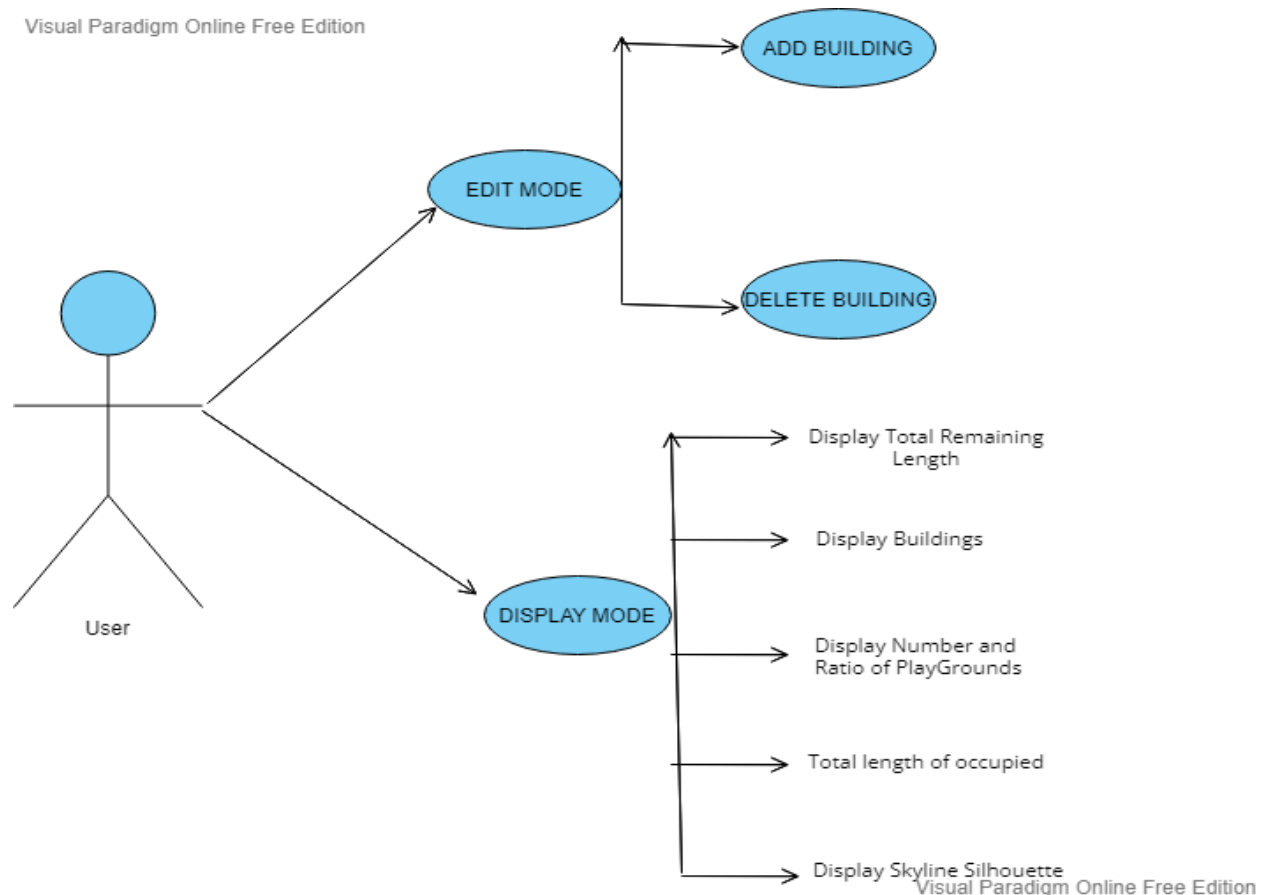
There will be some mistakes while running on jdk and jre below this version.

The user need to enough space to store datas of building.

2.USE CASE AND CLASS DIAGRAMS



2.2 USE CASE DIAGRAM



3.PROBLEM SOLUTION APPROACH

Our problem is that making the Street Planning Software that user can organize the street with two sides. Building has position, length and height properties. The house, office , market and Playground is derived from Building with some additional properties. We use polymorphisim in here.

The street hold buildings in an array .The Building Array is dyamically reallocated if the array capacity is full. When user wanted to add building to the street, program must check the position if Any building is already there. The building is compared with building in its side. There is a Id for each building. The Id is incremented by one each time building is added. Then assign these id to building to be added. First id is 0.

There are two mode. Display and edit mode. User can remove any building in street the querying with building id in edit mode.

User can display all building details in display mode, overridden toString() method is run in backend.

Displaying Skyline Silhouette is solved with some basic steps. Skyline silhouette is stored in 2D char array with initial value of every char is '.' . Firstly all of buildings is sorted by position. When the building is finded, array's value is changed to '#' charechter. Then these value is printed but not '.' Characters in the 2d array.

Other displaying operations can be run in display mode.

3.1 GENERAL METHOD PROBLEMS

ADDING and DELETING FUNCTIONS

```
public void addBuilding(Building building) {
    if(checkPosition(building)){
        if(_buildingNumber >= _buildingCapacity){
            enlargeBuilding();
        }
        buildings[_buildingNumber++] = building;
        building.setId(Building._nextId);
        ++Building._nextId;
        System.out.println(building.getClass().getSimpleName()+ " is added");
        if(building.getSide() == "r"){ ++_rightSideNum;}
        else if(building.getSide() == "l"){++_lefSideNum;}
    }
    else System.out.println("There is no enough space to locate the " + building.getClass().getSimpleName());
}

/**
 * Delete building from Street
 * @param building to be deleted
 */
public void deleteBuilding(Building building) {
    for(int i =0 ; i< _buildingNumber; ++i){
        if(buildings[i].equals(building)){
            shiftBuildingsArray(i);
            --_buildingNumber;
            tidyUptheArray();
            System.out.println("Building is deleted");
        }
    }
}
```

IDE error occurred
See details and submit report

ENLARGING BUILDING ARRAY

```
/**
 * Enlarge the Building array dynamically
 */
private void enlargeBuilding(){
    Building[] tempBuildings = new Building[_buildingCapacity*2];
    System.arraycopy(buildings, srcPos: 0, tempBuildings,
                     destPos: 0, _buildingNumber);
    buildings = tempBuildings;
    _buildingCapacity *=2;
}
```

4.TEST CASES

- Create User with Street Length.
- Create 2 House, 2 Market, 2 Office, 2 Playground.
- Display created building details.
- Delete some buildings from street.
- Display the total remaining length of lands on the street.
- Display the number and ratio of lenth of playgrounds in the street.
- Calculate the total length of street occupied by the markets, houses or offices.
- Display Skyline Silhouette.

5.RUNNING AND RESULTS

There are most of operation's photos in this part.

Main Menu:

```
Terminal: Local x
PS D:\Java\City Planning\src> javac Main.java
PS D:\Java\City Planning\src> java Main

Welcome The City Planning Software
1-> Start Program Menu
2-> Start Driver Code
0-> Close the program
Enter the operation:
1
```

Getting Street Length

```
Welcome The City Planning Software
1-> Start Program Menu
2-> Start Driver Code
0-> Close the program
Enter the operation:
1
Please Enter the Lenght of the Street
40
```

Choosing the Mode Menu

```
1-Editing Mode  
2-Display only Mode  
0-Back to the Main Menu
```

```
1
```

Adding, Deleting Operation Menu

```
1-Add Building on a Land in Street  
2-Delete Building on a Land in Steet  
0-Back to Select Mode
```

```
1
```


Add House

```
1-Add House
2-Add Market
3-Add Office
4-Add Playground
Press another key to Edit Menu
1
```

```
Adding the House
Please Enter the Owner of House : House1
Please Enter the Color of House : Red
Please Enter the Number of Rooms : 3
Please Enter the Position of the Building : 1
Please Enter the Lenght of the Building : 5
Please Enter the Height of the Building : 8
Please Enter the Side of the Street (right to r, left to l): r
House is added
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
```

Add Market

```
1-Add House
2-Add Market
3-Add Office
4-Add Playground
Press another key to Edit Menu
2
Adding the Market
Please Enter the Owner of Market : Market1
Please Enter the Opening Time of Market (ex: 07:06) : 07:30
Please Enter the Closing Time of Market (ex: 09:12) : 21:00
Please Enter the Position of the Building : 3
Please Enter the Lenght of the Building : 7
Please Enter the Height of the Building : 6
Please Enter the Side of the Street (right to r, left to l): l
Market is added
```

Add Office

```
1-Add House
2-Add Market
3-Add Office
4-Add Playground
Press another key to Edit Menu
3
Adding the Office
Please Enter the Owner of Office : Office1
Please Enter the Job Type of Office : Software
Please Enter the Position of the Building : 7
Please Enter the Lenght of the Building : 4
Please Enter the Height of the Building : 7
Please Enter the Side of the Street (right to r, left to l): r
Office is added
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
```

Add PlayGround

```
1-Add House
2-Add Market
3-Add Office
4-Add Playground
Press another key to Edit Menu
4
Adding the PlayGround
Please Enter the Position of the Building : 11
Please Enter the Lenght of the Building : 6
Please Enter the Side of the Street (right to r, left to l) : l
PlayGround is added
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
```

Invalid Location Input

```
1-Add House
2-Add Market
3-Add Office
4-Add Playground
Press another key to Edit Menu
1
Adding the House
Please Enter the Owner of House : House2
Please Enter the Color of House : Blue
Please Enter the Number of Rooms : 3
Please Enter the Position of the Building : 4
Please Enter the Lenght of the Building : 3
Please Enter the Height of the Building : 10
Please Enter the Side of the Street (right to r, left to l) : r
There is no enough space to locate the House
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
```

Displaying Menu

```
1-Editing Mode
2-Display only Mode
0-Back to the Main Menu
2
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Display Building Details (Some Building was added)

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
2
Displaying Buildings
House >> Owner : House1 -> Position : 1 -> Id : 0 -> Side : r
Market >> Opening Time : 07:30 -> Close Time : 21:00 -> Position : 3 -> Id : 1 -> Side : l
Office >> JobType : Software -> Position : 7 -> Id : 2 -> Side : r
PlayGround >> Lenght : 6 -> Position : 11 -> Id : 3 -> Side : l
House >> Owner : House2 -> Position : 12 -> Id : 4 -> Side : r
Office >> JobType : Sport -> Position : 18 -> Id : 5 -> Side : l
Market >> Opening Time : 07:15 -> Close Time : 21:45 -> Position : 17 -> Id : 6 -> Side : r
Office >> JobType : Enterprise -> Position : 27 -> Id : 7 -> Side : l
PlayGround >> Lenght : 3 -> Position : 36 -> Id : 8 -> Side : l

Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Total Remaining Lenght of Lands on the Street

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
1
Displaying Remaining Length
28

Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Number and Ratio of length of Playgrounds

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
3
Displaying the number and ratio of Playground
Total Number : 2 -> Ratio Of Playground: 0,112500
```

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Occupied Land by Markets, Houses or Office

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
4
Displaying the Occupied Length
43
```

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Skyline Silhouette

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouvette of the street.
0- Back to the Mode
5
Displaying Skyline Silhouutte
*****
*   * *****
*   ***  *   *****
*       * **** *       *
*       * *  * *       *****
*       * *  * *       *
*       ***  ***       *   ***
*****
*****
0----5----10----15----20----25----30----35----40
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouvette of the street.
0- Back to the Mode
█
```

Delete Some Buildings

```
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
2
Please Enter the Id of the Building
0
Building is deleted
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
2
Please Enter the Id of the Building
3
Building is deleted
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
2
Please Enter the Id of the Building
4
Building is deleted
1-Add Building on a Land in Street
2-Delete Building on a Land in Steet
0-Back to Select Mode
█
```

Display Buildings Array Remained

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
2
Displaying Buildings
Market >> Opening Time : 07:30 -> Close Time : 21:00 -> Position : 3 -> Id : 1 -> Side : l
Office >> JobType : Software -> Position : 7 -> Id : 2 -> Side : r
Office >> JobType : Sport -> Position : 18 -> Id : 5 -> Side : l
Market >> Opening Time : 07:15 -> Close Time : 21:45 -> Position : 17 -> Id : 6 -> Side : r
Office >> JobType : Enterprise -> Position : 27 -> Id : 7 -> Side : l
PlayGround >> Lenght : 3 -> Position : 36 -> Id : 8 -> Side : l

Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Total Remaining Length of Lands Remained on the Street

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouvette of the street.
0- Back to the Mode
1
Displaying Remaining Length
43

Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouvette of the street.
0- Back to the Mode
```

Number and Ratio of length of Playgrounds

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouvette of the street.
0- Back to the Mode
3
Displaying the number and ratio of Playground
Total Number : 1 -> Ratio Of Playground: 0,037500

Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouvette of the street.
0- Back to the Mode
```


Occupied Land by Markets, Houses or Office

```
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
4
Displaying the Occupied Length
34

Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```

Skyline Silhouette

```
Displaying Mode
1-display the tootal 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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
5
Displaying Skyline Silhoutte
      ****
    ***** *      *****
    *      *      *      *
    *      *      *      *****
    *      *      *      *
    *      *      *      *      ***
    *****      *****      ***
*****
0----5----10----15----20----25----30----35----40
Displaying Mode
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-Display the total length of street occupied by the markets, houses or offices.
5-display the skyline silhouette of the street.
0- Back to the Mode
```