Contents

1 Idea

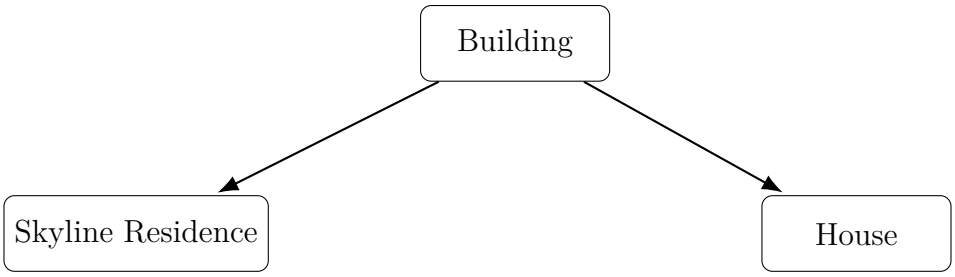
Multiple cities exist each corresponding to unique players. We choose which player to play as in menu.

Players can do bunch of things in their cities that expand their cities, leading to changes in *Eco-Scores*. There are checkpoints on reaching certain EcoScore which give players experience.

Players can share their cities (we will display city resources and expansion). They can compete on EcoScore (simple EcoScore comparision with some motivation on boosting EcoScore for the loser, or think something different).

2 Class Hierarchy

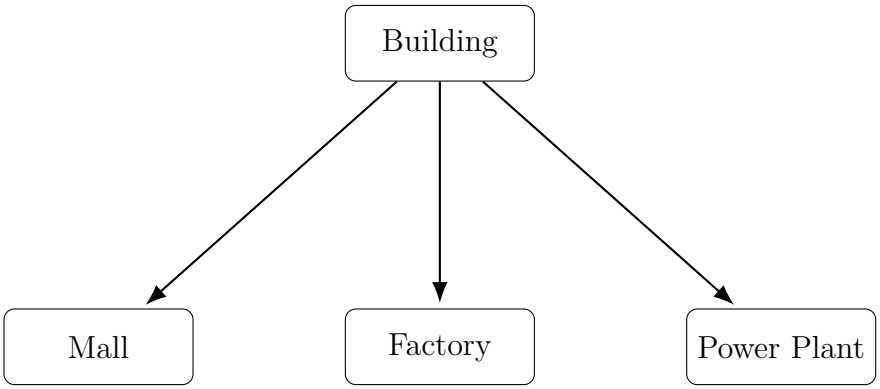
2.1 Residential:



1. **Building:** Land cover
2. **House:** # of Rooms
3. **Skyline Residence:** # of Apartments

Building Residential objects increase population count.

2.2 Commercial

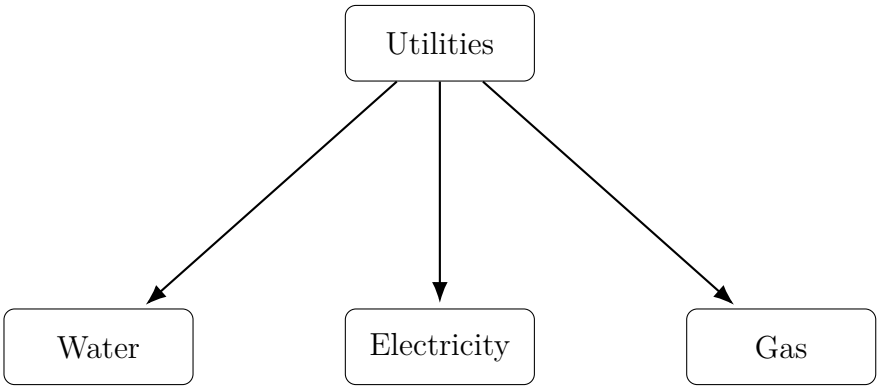


1. **Building:** Land cover
2. **Mall:** # of outlets

3. **Factory:** Has a Level. Player works in the factory and earns money according to some function of the level of the factory.

4. **Power Plant:** Energy generation capacity. Option to make different types of powerplants.

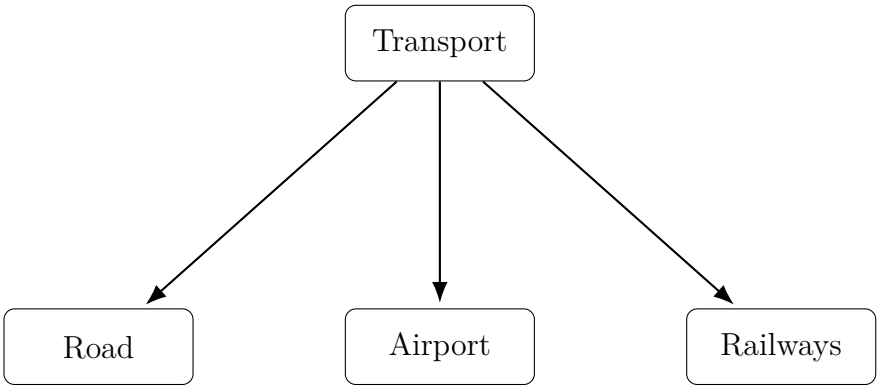
2.3 Utility



Not much here, Utility objects will have Capacity and Current Usage.

Utility objects will be attributes of Residential objects.
Global Water, Electricity, Gas objects will also be set to track total consumption of the city.

2.4 Transport



Transport: has a fixed maintenance cost, travel cost, maintenance state and a level attribute. A higher level reduces travel costs. Each travel action decreases the maintenance score.

2.5 Vehicles

Not much here. EV and ICE Vehicles. Fixed cost of each.

3 Other Classes

3.1 City

We will have City array.
Attributes are cityName, Player, EcoScore.

3.2 Player

1. **Gold**: Earned through working in the Factory. Starts with some amount.
2. **Experience** Different from gold. Expanding, building or any other activity gains experience.

3.3 Environment

1. **Pollution Level:** Increases/Decreases by (not) choosing environmentally friendly practices.
2. **EcoScore:** Improve by choosing environmentally friendly practices.
3. **Population:** # of people living. Calculated using # of Houses and Skyline Residences.
4. **Transport Network** A score given based on Road, Railway, Airport network.

4 Activities:

Each of the function need to relate to choosing *Environmentally Friendly Practices.*

4.1 Buy()

Overloaded to buy buildings.

4.2 Maintenance()

Shows things needing maintenance. Overload friend operator to maintain stuff.

4.3 GoToMall()

Wastes gold. Earns experience.

4.4 GoToWork()

Earns Money. Has a cooldown before player can go again.

4.5 ShowMyCity()

Shows Environment attributes.

4.6 Compete()

Chooses competitor city. Shows both city resources, compates eco scores of both.

4.7 Log()

Records each action in logs.txt