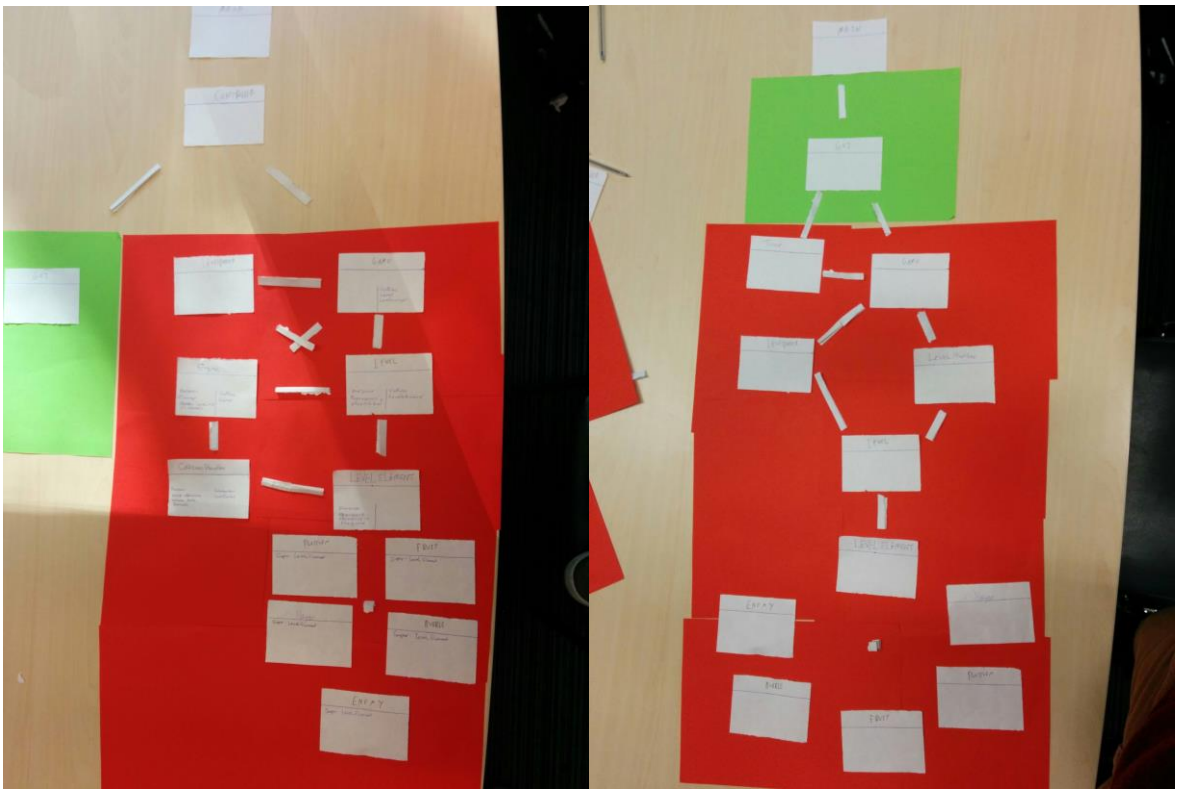
**Exercise 1 - The Core**

## 1.1 Responsibility Driven Design



## 1.2 Main Classes

**Controller**

| Collaborators: | Purposes: |
|---|---|
| Game | Connects the model (Game) and the view (GUI). |

**Game**

| Collaborators: | Purposes: |
|---|---|
| LevelParser | Represent a game with all related attributes. |
| Level | |
| Engine | |

**Engine**

| Collaborators: | Purposes: |
|---|---|
| CollisionHandler | Apply physics and other events to a Level. |
| Level | |

**Level**

| Collaborators: | Purposes: |
|---|---|
| LevelElement | Represent a Level in a game. |

**LevelElement**

| Collaborators: | Purposes: |
|---|---|
| | Represent all the elements in a given Level. |

**GUI**

| Collaborators: | Purposes: |
|---|---|
| | Visualise a game in its current state. |

**LevelParser**

| Collaborators: | Purposes: |
|---|---|
| | Loads a file from a text file. |

**CollisionHandler**

| Collaborators: | Purposes: |
|---|---|
| | Detects collisions in a Level. |

## 1.3 Less important Classes

The Classes not mentioned above are the subclasses of LevelElement and they did not seem significant enough to specifically mention as the closely resemble LevelElement.

As for the differences between our setup and the newly derived one, they are as follows:
1. The Engine class is split up into the StepTimer and various LevelModifiers. If we put them all in one Class it would have been a mess now it is much more readable.
2. The missing controller, because of JavaFX demanding to be the main Class that has to be run we could not implement a separate controller class.

On all other accounts the two models resemble each other very closely, as such we did not change anything to our codebase.

## 1.4 Class Diagram

See Scrumbledore_Sequence_Diagram.asta in the UML folder.

## 1.5 Sequence Diagram

See Class Diagram Scrumbledore 2.0.png/.asta in the UML folder.

### Exercise 2 - UML in practice

1. If the relation between two classes is a composition it would mean that one class is a definite part of the whole, which is the other class. On the other hand, an aggregation relationship would mean that the class could be a part of the other class, but could also be independently used.

   In our own game for instance, we implemented the classes Game and Level. Since our game consists of level and can't be played without them, the relationship between Game and Level can be called a composition.
2. Currently we do not have any parameterized classes. You can use these sort of classes if these classes only use certain parameter types. For instance, a list that only contains instances of the type String and only has methods that process this certain type, you can parameterize this class.
3. We have one 'polymorphism' and one 'is-a' hierarchy. We used polymorphism for the subclasses of LevelElement so that we could make a lot of different level elements in the game. For the KineticsLevelModifier we made more subclasses in order to simplify the structure. These subclasses 'are-a' KineticsLevelModifier, but not the way around. According to the lecture none of our current hierarchies should be removed since no 'reuse'-hierarchy is taking place.