Design application report

# Buildings

* 1. **Functionalities needing to be met**
* Need to facilitate the various types of buildings based on the needs of the citizen
  + Residential
  + Industrial
  + Commercial
  + Landmarks
* Based on each unit created, it must be supplied with the various utilities in order to make it a fully functional building unit
* All types of buildings, be it units or whole buildings should be able to be treated equally to ensure that the interaction between them and other classes are uniform.
  1. **Design pattern used (members)**
* The composite pattern was used:
  + Leaves: Residential, Industrial, Commercial, Landmarks
  + Component: Buildings
  + Composite: BuildingUnit
  + Client: Client
  1. **Explanation as to why that pattern was used**

Seeing that all buildings, despite being a whole building or a unit, would need to preform and be treated equally by other structures, the composite design pattern came to mind. This pattern highlights the tree-like structure implemented for the various types of buildings and their children and allow the user to treat both the individual objects and the composition of the objects uniformly. This will therefore allow each leaf (Residential, Industrial, Commercial, Landmarks) and every composite (BuildingUnit) to gain access to resources equally, to be created by citizens equally, to behave equally and contribute towards their function of both housing and providing a place of business, production or tourism (contributing toward citizen satisfaction) as well as contributing towards the economic development of the city themselves (roles in Government and Bank). Additionally, another member was added to allow for the inclusion of resources in each building unit/whole building by iterating through the responsible utilities. This will include the needed resources in each building unit/whole building by iterating through the utilities and their various types, which then calls on the resources (through the Government) to equip each building unit/whole building with resources, thus treating each composite and leaf uniformly. This member is called BuildingIterator and in conclusion, it is responsible for equipping each building unit/whole building with its needed resources by calling upon its responsible utility.