

Team-24 Design Pattern Application Report

We made use of 11 design patterns:

Singleton: The singleton was used in the ResourceManager, CitizenManager, CityManager, ZoneManager to ensure a single instance of the core management systems was used

Command: We encapsulate city operations as objects to make issuing said operations simple and efficient. It was used in the BuildCommand, DemolishCommand, ChangePolicyCommand, UpdateResourcesCommand, SimulationCommands.

State: It was used to manage the life cycle of buildings used in the Abandoned, Operational, UnderConstruction and UnderMaintenance.

Observer: Notification and alerts of changes in the system that affected the civilization. Used in the Building, Zone, Government, Citizens and Statistics classes.

Visitor: Separated the algorithms and function calls from object structures. Used in the BuildingVisitor, InspectionVisitor, MaintenanceVisitor, Building, Commercial, Industrial, Residential, Landmark classes

Strategy: Defined different methods and policies for running the city. Used in the TaxStrategy, HighIncomeTaxStrategy, LowIncomeTaxStrategy and TaxPolicy classes

Factory Method: Used to create building attributes. Used in the BuildingAttributeFactory and BuildingAttribute classes.

Memento: Used to store specific policies and previously successful strategies. Used in the Policy, PolicyMemento and Government classes.

Facade: Provided an easy to use, unified interface. Used in the SimulationFacade, SimulationEngine classes

Composite: Handled zones and treated them uniformly. Used in the ZoneManager and zone classes.

Builder: Used to construct complex road networks efficiently. Used in the RoadBuilder, Road and RoadNetwork classes.