Solution 3: Of objects and features

ETH Zurich

1 Classes vs. objects

Solution

There is no unique solution. Sample answers:

1.1 Definition and description of the concept "Class". A class is a description of a set of possible run-time objects to which the same features are applicable.

   A class does several things:
   
   – It provides a description of how objects will behave at runtime in response to feature calls
   – It provides an interface for the programmer to interact with the definition of objects during development
   – It is a source of new objects in a running system

   As such, a class can be interpreted as "a form of template" (where the term class is associated to a collection of related entities - objects that are considered to be instances of the same class defining their properties and operations), "a form of structure" (offering a restricted interface to clients), and "a form of type" (allowing to declare entities with a type that is a class).

   Definition and description of the concept "Object". An object is a software machine allowing programs to access and modify a collection of data. An object can be manipulated through a set of operations, defined in its generating class. Objects only exist at run-time.

   1.2 A class can be looked at as the blueprint of a machine, while the object is the actual machine built according to the blueprint.

2 Categorizing features

Solution

Queries:
   
   • actual_time
   • duration
   • speedup
   • is_time_running

Commands:
3 Feature reading

Solution

1. Target is of type `TRAFFIC_LINE`.

2. Target is of type `TRAFFIC_POINT`.

3. Target is of type `TRAFFIC_STATION`.

4 Writing more feature calls

Solution

Listing 1: Class `PLANNER`
class PLANNER

inherit TOURISM

feature -- Explore Paris

explore_on_click is
  -- Explore Paris!
  do
    Paris.display
    -- Paris.display must be the first line (loads and displays Paris map)

Line1.remove_all_segments
Line1.extend (Station_concorde)
Line3.remove_all_segments
Line3.extend (Station_concorde)
Line7_a.remove_all_segments
Line7_a.extend (Station_concorde)
Line8.remove_all_segments
Line8.extend (Station_concorde)
Line2.remove_all_segments
Line2.extend (Line3.terminal_1)
Line2.extend (Line7_a.terminal_1)
Line2.extend (Line1.terminal_1)
Line2.extend (Line8.terminal_1)
Line2.extend (Line2.terminal_1)
end
end