Software Design
Laboratory 1 - Problems

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1 Problem 1

The problem clearly suggests having two different classes, one for Vertex, the other one for Edges. More generally, I would opt for two distinct approaches:

1. Using a collection of Edge and Vertex elements to define the Graph
2. Using Node, with a collection of Nodes (for the associated adjacency list) to define the Graph

Also, in both cases, I've taken into account the idea that a Graph might have multiple connected components, so it's cleary a composition rule(because by deleting for example the main Graph, all it's components must also be deleted). To not enter in an infinite cycle, I've set 0..*.

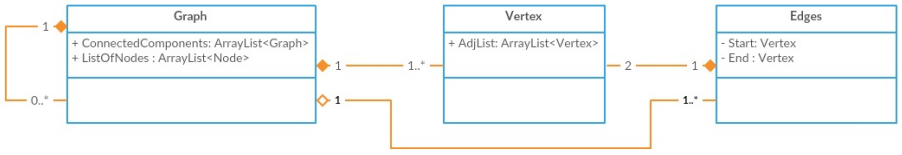

Figure 1: Edges and Nodes approach

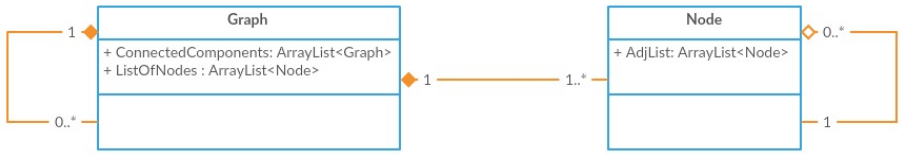

Figure 2: Node with adjancency list

2 Problem 2

For the second problem I've thought that the company is actually defined by the departments in which it's activities are running. Also, I've chosen a dependency between the department and the building, as the building is not, in a functional sense, linked with the department.

Figure 3: Company, department, building

3 Problem 3

The DrawingObj, GeomObj, Text, Groups are classes that should be stand alone, so I've chosen only a dependency between them and the Sheets. Also, the GeomObj is a superclass for the more particular geometric shapes, but that can maintain some general properties, shared by all the geometric shapes (corners —— radius —— focal points etc.).

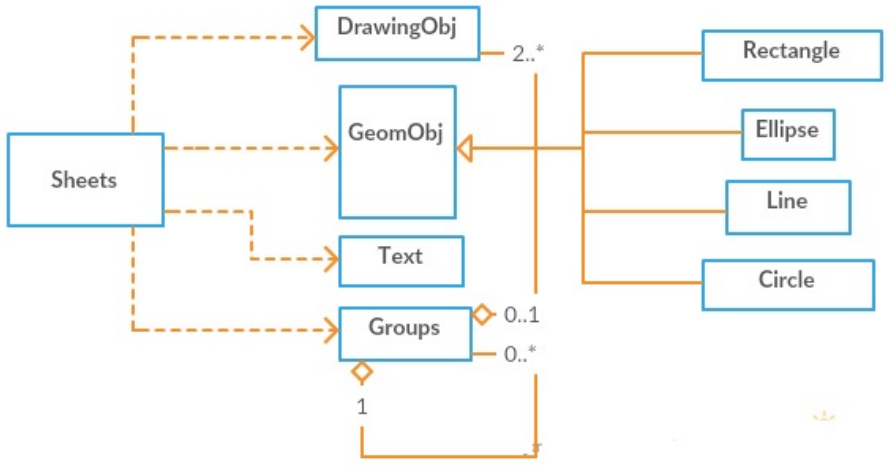

Figure 4: Graphic editor with group management

4 Problem 4

4.a The general blueprint for the classes, highlights some aspects that I've

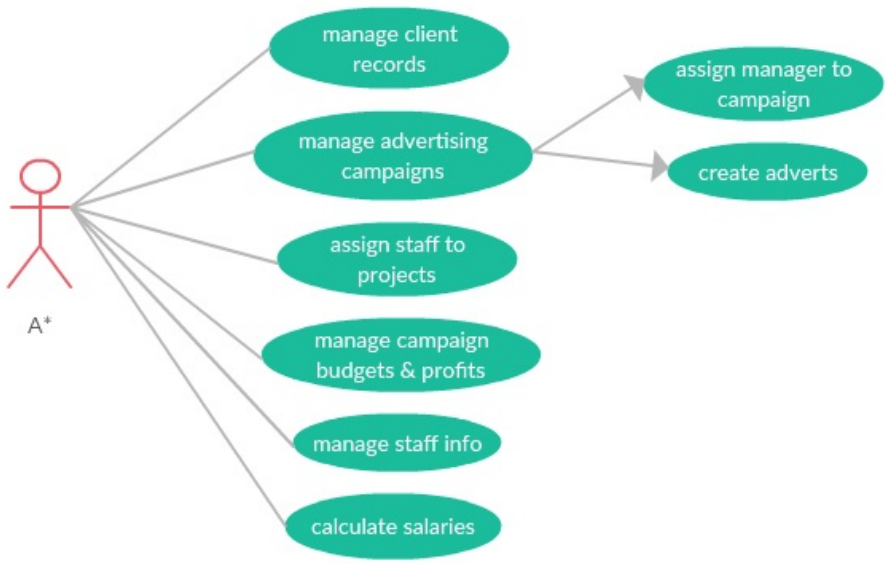

Figure 5: Use case for A*

thought to be definitory for the problem description like:

1. All the clients must have an associated Client Record so I've chosen a 1 to 1 association
2. The same idea as above applies between the Advertising Campaign and Campaign Record.
3. Because both the Client Record and the Campaign Record represent a version of a more general type of Report, or at least a format of a Report, so I've chosen an interface to be extended by the two.

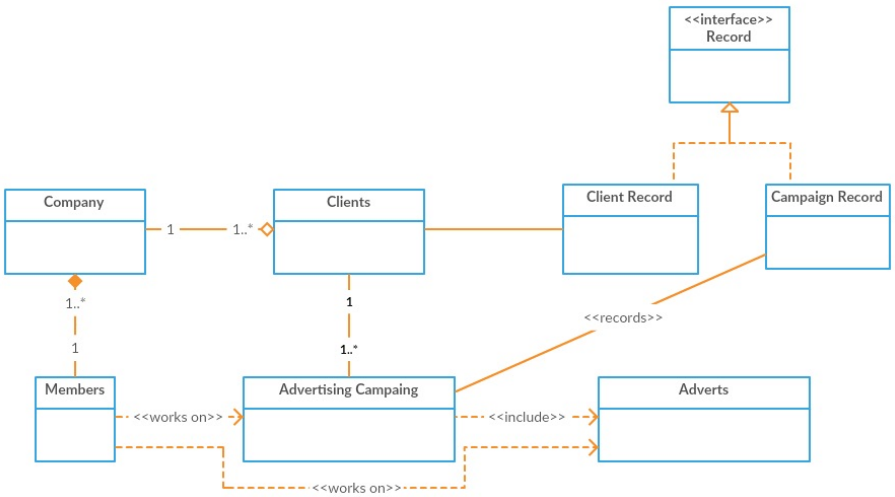

Figure 6: General UML for the A* company