

Problem 10

1 The basic problem

Suppose an object needs to react differently to various messages depending on its state – that is, it has various modes. The differences are as significant as though the object had changed class.

Consider, for example, the case of a class `DrawingTool` which must react differently to mouseclicks depending on whether the user is in the process of using a rectangle-drawing tool, a selection tool or an enlargement tool.

2 An initial solution...

3 A standard solution: STATE

We define a separate abstract class – say `State` – whose objects represent the state of the object we're interested in (which let's say has class `Context`). The concrete subclasses implement the behaviour required in the various states. A `Context` knows about its `State`. When a context receives a request, it passes the request on to its `State`. When the `Context` changes state in a significant way, its `State` object is replaced by a new `State` object of a different concrete subclass, which implements the newly required behaviour.

To check your understanding of the solution, sketch a class diagram for the case of the drawing tool.

4 When and why is this solution good?