Tutorial: activity diagrams

October 8, 2012

Purpose

Let you practise developing activity diagrams, and thinking about their practical use.

Exercises

Everyone should become able to do these. If you have trouble ask your tutor.

1. Visit `http://www.uml-diagrams.org/activity-diagrams-examples.html` where you will find brief descriptions of activities, mostly quite familiar from everyday life. Use a few of these for activity diagram practice:

   (a) read the brief description and see what is unambiguous and what would require clarification;

   (b) draw an activity diagram corresponding to the description, noting where you have to make your own interpretation or use knowledge you have from elsewhere;

   (c) click on the activity title to see an activity diagram;

   (d) compare your diagram with the one on the page – which differences are your errors, which different interpretations or choices about what to represent? Are there errors on the page?

   There are a few features that you will see in their diagrams that are good to be able to read but which I will not examine you on. There's no particular reason I shouldn't have included any of these in the course: it's just that my general approach is to try to make sure you can confidently use a small subset of UML sufficient for everyday use, rather than getting lost in too many bits of notation.

   - the use of objects as intermediaries between activities (e.g. Draft Document in Document Management Process): informally this is pretty easy to understand, but the notation isn't good when you get down to details such as "is this a newly created object, or is it a modified version of one we saw earlier?"
   - the use of signals, shown as flag shapes, to start activities (e.g. Check Shopping Cart in Online Shopping): sometimes useful, but it can be just as easy to draw a separate activity diagram for what happens after that signal occurs.
   - the use of labelled entry/exit points, e.g. A, B, C in Online Shopping: a notational convenience especially in big diagrams.

2. Develop an activity diagram for the process of booking a party, as described in the earlier tutorial. Focus on the business-level process, i.e. show the whole computer system in one swimlane and show the client and any other humans, companies or external systems involved each in their own swimlane. Pay particular attention to concurrency.

More challenging questions

Do these if you have time now, or later for revision.

1. Now consider the use of activity diagrams at a much lower level. Pick an interesting sequence diagram e.g. from your earlier work or from the reading, preferably one that involves the UML2 fragment notation such as alt and loop fragments to show more than a simple interaction. Turn it into an activity diagram in which each lifeline becomes a swimlane and each "bit" of computation internal to an object becomes an activity, with messages and returns connecting activities. Could you make this process sufficiently precise that a tool could turn any sequence diagram into an activity diagram? Are there any difficult issues that would come up? Would this ever be useful? Why, or why not?

2. Thinking about each UML diagram type you have met so far, consider the situations in which they would (a) most often (b) occasionally be useful, and why.