

HOMWORK 2

ECE505

d2l: hw02

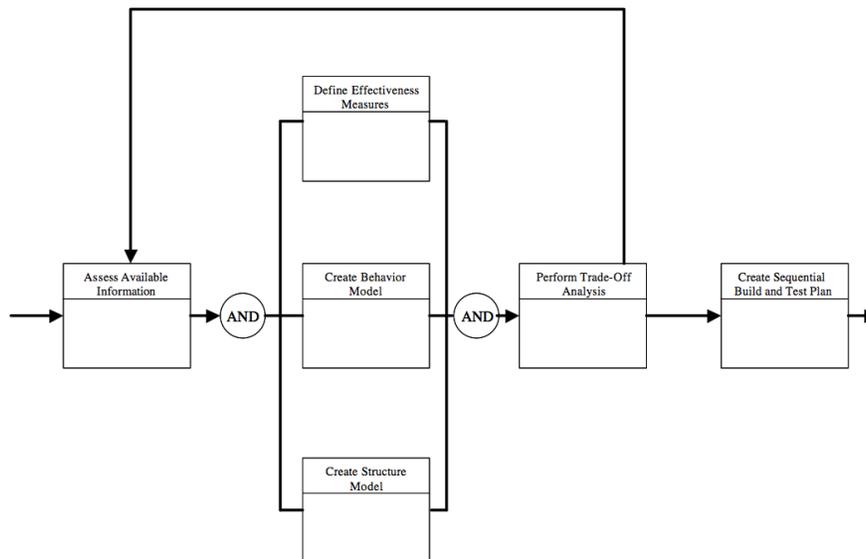
Due: 14 October 2010

This homework provides introduces the use of GME in behavioral modeling, and structural modeling of non-class diagrams. Additionally, you will explore the definition of syntax and semantics for a *textual* language. You will likely need to look in additional resources (papers, books) from the web or library in order to complete this assignment.

1 Charting new territory

Please download and install the GME StateChart modeling paradigm from the class web page. A README file discusses differences between this paradigm and Harel's StateChart representation. Be sure to turn in XML versions of your models. Please continue to use the naming convention from the first homework assignment.

Construct a StateChart representation of the following FFBD using the supplied GME StateChart paradigm. (For more information on this model, see Chapter 3 in Oliver). Export your model to `hw02-lastname-1.xme`.



2 Bib bib bib, bib bib-aran

Download and install the PubDB modeling paradigm from the class web page, and use it to model the bibliography of Harel's StateChart paper from the reading page. Your grade will be based on a complete representation of the bibliography, not its format in output. For example, your generated output from HTML or BIB interpreters *need not* duplicate the ordering, case, formatting, etc., of Harel's paper. Export your model to `hw02-lastname-2.xme`

3 Syntax in da hiz-house

Create an EBNF grammar for the ability to add, subtract, and multiply, terms. You should **not** assume that all numbers are single digit. You should require parentheses if a particular expression has more than two elements, to clarify order of operation.

You are advised to create a shorthand for each syntax type, which you can use in the next part of each assignment. You can name these like: `a1 ::= syntaxobject;` in order to represent $a_i \in \mathcal{A}$. Select a parser generator tool from the web, and generate a parser from your grammar. In addition to submitting your grammar file, include a writeup that describes the parser generator you selected, why you selected it, and any difficulties you had in generating the parser. Your grade will be based on the completeness of your grammar, as well as the clarity and strength of your writeup. Collect these files together in a directory named `hw02-question3` in your submission. You should also submit (perhaps in a subdirectory) the code that was generated using your parser generator.

4 Semantics in da flippity-floppity-floop

Using your definition of syntax elements in Question 3 define the denotational semantics for your language into the standard mathematical terms of add, subtract, and multiply. Submit this definition, and write a brief summary of how you would use these denotational semantics in conjunction with the code generated in Question 3 in order to produce a working compiler.