Prose Assignment

Due Fri 6th Mar 2010

1. Consider a domain-specific language (DSL), with the following grammar:

```
@input Double x;
@start Double program := add(x,k1,k2) | mul(x,k1) | div(x,k1);
Double k1;
Double k2;
```

where x is an input variable with the type double. A program outputs a number as the result of evaluating the expression on the input. Assume that a program with the "add" operator has higher rank than programs with "mul" and "div" operators.

Implement prose code to synthesize top four programs (within the DSL) that are consistent with the given input-output examples.

Input	Output	SamplePrograms
3	18	a. add(x, 11, 4)
		b. mul(x, 3)
20	5	a. add(x, -10, -5)
		b. div(x, 4)
10	20	a. add(x, 5, 5)
		b. mul(x, 2)

2. Consider a DSL, with the following grammar:

$$E \rightarrow E + E \mid id$$

where id is an input variable with the type unsigned integer. Write Prose code to synthesize top four programs (within the DSL) that are consistent with the following input-output examples.

Input	Output
10	100
20	200
3	30

Email your code (including witnessFunctions, rankingFunctions, grammar, semantics and mainFunction) to habeep@iisc.ac.in and CC rekhapai@iisc.ac.in.