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Note Title

2013-01-17

HW1 Exercises 1.2, 1.4-1.6  
in the textbook, due 1/24

Please turn in hard copy, unless  
you are in Section 6 (Apogee)

Heron's formula to compute the area of a triangle,  
as:

$$\sqrt{s(s-a)(s-b)(s-c)}, \text{ where } s = \frac{a+b+c}{2},$$

and  $a, b, c$  are the sides of the triangle.

In a high-level language (e.g. ML or Triangle),  
the expression

let  $s = (a+b+c)/2$

in  $\text{sqrt}(s * (s-a) * (s-b) * (s-c))$

evaluates to the desired area.

In a hypothetical assembly language, you would

have to write:

adds b to R1 and sets R1 to the updated value



LOAD R1 a; ADD R1 b; ADD R1 c; DIV R1 #2;

LOAD R2 R1;

LOAD R3 R1; SUB R3 a; MULT R2 R3;

— R2 now contains  $s \times (s-a)$

LOAD R3 R1; SUB R3 b; MULT R2 R3;

LOAD R3 R1; SUB R3 c; MULT R2 R3;

LOAD R0 R2; CALL SQRT j

An example derivation using the CFG on the slides.

Start  $\Rightarrow$  Letter  $\Rightarrow$  c

Another one:

Start  $\Rightarrow$  Start Digit  $\Rightarrow$  Start LetterDigit  $\Rightarrow$

$\Rightarrow$  Start d Digit  $\Rightarrow$  Letter d Digit  $\Rightarrow$

$\Rightarrow$  a d Digit  $\Rightarrow$  a d 7