Programming Languages
HW 1, Oct 6 2008

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Due in **two** weeks

Problem 1.

Consider the following EBNF defining floating point constants in Java:

```
float_literal       ::=
      ( decimal_digits ''.'' [ decimal_digits ] [ exponent_part ] [ float_type_suffix ] )
      | ( ''.'' decimal_digits [ exponent_part ] [ float_type_suffix ]
      )
      | ( decimal_digits [ exponent_part ] [ float_type_suffix ] )
decimal_digits   ::=  ''0..9'' { ''0..9'' }
exponent_part    ::=  ''e'' [ ''+'' | ''-'' ] decimal_digits
float_type_suffix  ::=  ''f'' | ''d''
```

1. Show the parse trees of the following: .55555555d, 58e-4, 5e55f

2. If you change the definition of `decimal\_digits` to ''0..9'' [''0..9''], what is going to happen ?

Problem 2.

Next consider the following EBNF (defining integer in Java):

```
integer_literal  ::=
      ( ( ''1..9'' { ''0..9'' } )
      | { ''0..7'' }
      | ( ''0'' ''x'' ''0..9a..f'' { ''0..9a..f'' } ) ) ) <------ FOURTH LINE
      [ ''l'' ]
```

1. What does the fourth line mean?

2. Give 3 examples that obey to this rule.

Problem 3.

Consider the piece of C code shown below:

```c
char c=0;
while(c != 150)
{
  c++;
}
printf(''Finished !'');
```

What do you think this program is intended to do? Will it work correctly? If not, how will you correct it?

Problem 4.
Next, consider the following piece of C code:

```
int i=1;
printf(''%i\n'', 2 * ++i);
printf(''%i\n'', 2 * i++);
```

What is this program going print? Explain.

Miscellania.
There are two reading assignments below. Read them carefully and try to answer the each of accompanying questions. Your answers for these two readings will not be graded, but will be important for the next homework assignment. :) HAPPY HACKING (:

Reading 1. (Brainfuck) Read this: `http://en.wikipedia.org/wiki/Brainfuck`
Write a little program to print ''This class is great !!!''.
Reading 2. (INTERCAL) Read this: `http://en.wikipedia.org/wiki/INTERCAL`
Write a little program to print ''This language is simple to read !!!''.