

CS 331 Programming Languages, Spring 2013
Quiz 1 Solutions

Quiz 1 was given in class on Friday, January 25, 2013.

1. This problem concerns the grammar given below.

$S \rightarrow Ay$
 $A \rightarrow Ax$
 $A \rightarrow \epsilon$

1a. Based on the above grammar, write a derivation for the string "xxy".

We begin with the start symbol (S), apply one rule at a time, and finish with the required string.

S
 Ay
 Axy
 $Axxy$
 xxy

Note: The final rule applied was " $A \rightarrow \epsilon$ ". Remember that " ϵ " is not a character in our alphabet; it represents the empty string.

1b. Describe the language generated by this grammar.

The language is the set of all strings consisting of zero or more x s followed by a single y . In other words, y , xy , xyy , $xyxy$, $xyxxy$,

*Note: We could represent this language using the regular expression x^*y .*