Daily Questions

(due September 19, 2005) An identifier (name of a variable, class, or method) in Java must consist only of the upper and lower case letters, digits, `$`, and `_` characters. An identifier must have at least one character; it can be arbitrarily long; and it may not start with a digit. Furthermore, an identifier may not be any of the following words:

`if`, `for`, `int`, `class`

(there are many other reserved words, but including them all would only add pointless tedium to this question). Write a pattern (if you read Kozen, Sipser calls it a regular expression) that matches Java identifiers. In addition to the operations described in Sipser, you may also use (these are defined in Kozen):

#	Matches any character in Σ.
@	Matches any string in Σ^*.
$\sim \alpha$	Matches any string that doesn't match the regular expression α.
$\alpha \cap \beta$	Matches any string that matches both regular expressions α and β.

Whichever text you use, you can assume that the following patterns have already been defined:

$\alpha = \mathsf{A} \cup \mathsf{B} \cup \mathsf{C} \cup \ldots \cup \mathsf{Z} \cup \mathsf{a} \cup \mathsf{b} \cup \mathsf{c} \cup \ldots \cup \mathsf{z}$

$\beta = \mathsf{0} \cup \mathsf{1} \cup \mathsf{2} \cup \mathsf{3} \cup \mathsf{4} \cup \mathsf{5} \cup \mathsf{6} \cup \mathsf{7} \cup \mathsf{8} \cup \mathsf{9}$