

[*CHAR*]  
 $STATE ::= READ \mid WRITE$

|  $EOF : CHAR$

$STRING == seq(CHAR \setminus \{EOF\})$

$File$ $content : STRING$ $state : STATE$ $position : \mathbb{N}$
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$FileInit$ $File'$
$content' = \langle \rangle$ $state' = WRITE$

$Overwrite$ $\Delta File$ $in? : STRING$
$state = WRITE$ $content' = in?$ $state' = state$

$Append$ $\Delta File$ $in? : CHAR \setminus \{EOF\}$
$state = WRITE$ $content' = content \frown \langle in? \rangle$ $state' = state$

If a user tries to reopen an open file it will not reset the read position.

$Open$ $\Delta File$
$state = WRITE \Rightarrow state' = READ \wedge position' = 0$ $state = READ \Rightarrow state' = state \wedge position' = position$ $content' = content$

$Close$ $\Delta File$
$state' = WRITE$ $content' = content$

*ReadChar*

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$\Delta File$

$out! : CHAR$

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$state = READ$

$content' = content$

$state' = state$

$position \in dom\ content \Rightarrow out! = content\ position \wedge position' = position + 1$

$position \notin dom\ content \Rightarrow out! = EOF \wedge position' \notin dom\ content$

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