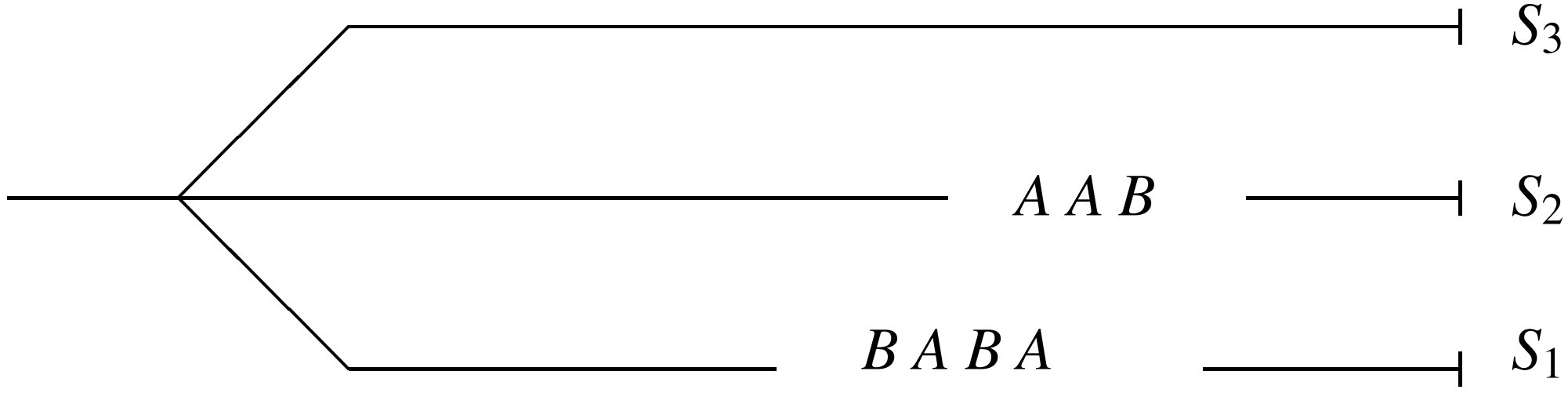
S_3
$A\ A\ B$
S_2
$B\ A\ B\ A$
S_1