

Practice Problems – Parsing

Sample Solution

1.

Stack	Input	Action
0	<i>aaabb</i> \$	<i>s5</i>
0, <i>a</i> , 5	<i>aabb</i> \$	<i>s5</i>
0, <i>a</i> , 5, <i>a</i> , 5	<i>abb</i> \$	<i>s5</i>
0, <i>a</i> , 5, <i>a</i> , 5, <i>a</i> , 5	<i>bb</i> \$	<i>r3</i>
0, <i>a</i> , 5, <i>a</i> , 5, <i>A</i> , 6	<i>bb</i> \$	<i>r2</i>
0, <i>a</i> , 5, <i>A</i> , 6	<i>bb</i> \$	<i>r2</i>
0, <i>A</i> , 2	<i>bb</i> \$	<i>s3</i>
0, <i>A</i> , 2, <i>b</i> , 3	<i>b</i> \$	<i>s7</i>
0, <i>A</i> , 2, <i>b</i> , 3, <i>b</i> , 7	\$	<i>r4</i>
0, <i>A</i> , 2, <i>B</i> , 4	\$	<i>r1</i>
0, <i>S</i> , 1	\$	<i>accept</i>

2. Since this grammar does not have a start symbol that only appears in one production, we need to add a new start symbol to the grammar:

0. $S' \rightarrow S$
1. $S \rightarrow aSa$
2. $S \rightarrow B$
3. $B \rightarrow Bbb$
4. $B \rightarrow c$

The resulting DFA is shown in Figure 1.

3. The resulting DFA is shown in Figure 2. There are no introduced parsing conflicts.

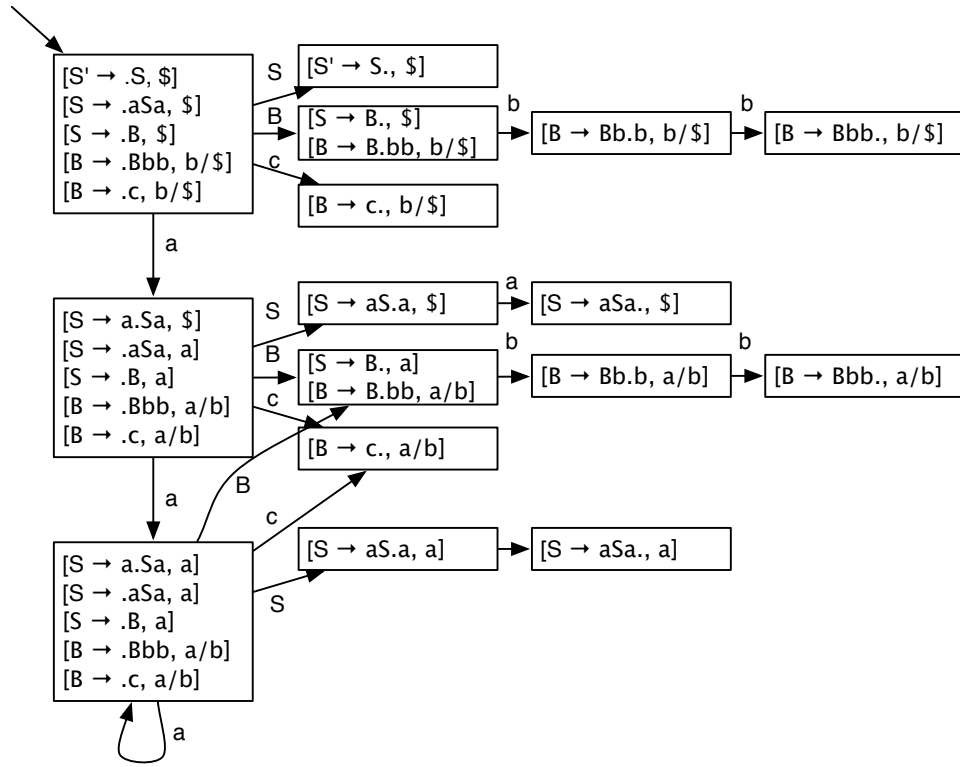


Figure 1: DFA for problem 2.

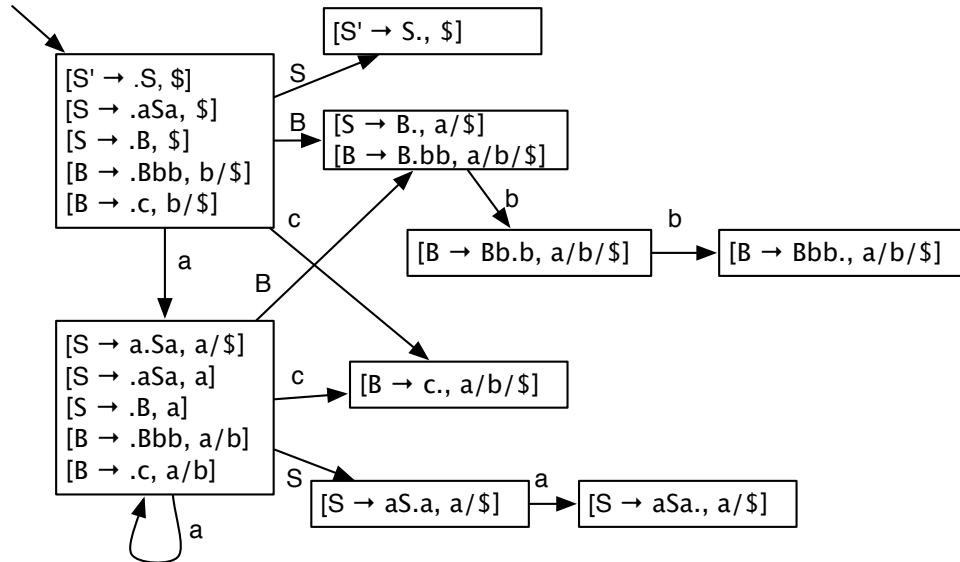


Figure 2: DFA for problem 3.