

Source File: ~/4301/07/lab07.(C|CPP|cpp|c++|cc|cxx|cp)
Input: Under control of `main` function
Output: Under control of `main` function
Value: 2

For $\Sigma = \{a, b\}$, construct a pushdown automata that accepts the set consisting of

$$\{w \mid w \in \{a, b\}^* \text{ and has one more } a\text{'s than } b\text{'s}\}$$

Valid strings include `a`, `aab`, `aba`, and `baa`, but not ϵ , `b`, `ab`, `aaba`, `bb`, `abab`, `aaaaa`, `bbba`, `aabb`, `aaabbbb`, `aaaabbbbb`, or `babb`.

This assignment will use the same header file and sample `main` function used for Lab 06. A sample execution sequence is shown in Figure 1. To use the `Makefile` as distributed in class, add a target of `lab07` to `targets2srcfiles`.

Additional notes:

- The `main` function appends the character ‘%’ to each line as it is read in.
- The halt state is 0 and the start state is 1.
- For each input string tested, the stack is initialized to ‘@’.

```

1 newuser@csunix ~> cd 4301
2 newuser@csunix ~/4301> ./getlab.ksh 07
3   * Checking to see if a folder exists for Lab 07. . .No
4   * Creating a folder for Lab 07
5   * Checking to see if Lab 07 has sample input and output files. . .Yes
6   * Copying input and output files for Lab 07
7     from folder /usr/local/4301/data/07 to folder ./07
8   * Checking to see if /usr/local/4301/src/lab07main.C exists. . .Yes
9   * Copying file /usr/local/4301/src/lab07main.C to folder ./07
10  * Checking to see if /usr/local/4301/include/lab07.h exists. . .No
11  * Copying file /usr/local/4301/src/Makefile to folder ./07
12  * Adding a target of lab07 to targets2srcfiles
13  * Touching file ./07/lab07.cpp
14  * Edit file ./07/lab07.cpp in Notepad++
15 newuser@csunix ~/4301> cd 07
16 newuser@csunix ~/4301/07> ls
17 00.dat      00.out      Makefile    lab07.cpp    lab07main.C
18 newuser@csunix ~/4301/07> make lab07
19 g++ -g -Wall -std=c++11 -c lab07main.C -I/usr/local/4301/include -I.
20 g++ -g -Wall -std=c++11 -c lab07.cpp -I/usr/local/4301/include -I.
21 g++ -o lab07 lab07main.o lab07.o -L/usr/local/4301/lib -lm

```

Figure 1. Commands to Compile, Link, & Run Lab 07 (Part 1 of 3)

```
22 newuser@csunix ~/4301/07> cat 00.dat
23 a
24 aab
25 aba
26 baa
27 aaabb
28 aabab
29 aabba
30 abaab
31 ababa
32 abbaa
33 baaab
34 baaba
35 babaa
36 bbaaa
37
38 b
39 ab
40 aaba
41 bb
42 abab
43 baaaa
44 bbba
45 aabb
46 aaabb
47 aaaabbbbbb
48 babb
49 newuser@csunix ~/4301/07> cat 00.dat | ./lab07
50 Your Name
51 CS 4301
52 Lab 7
53 {w | w in {a, b}* and has one more a's than b's}
54
55 Input: a Result: ** accepted **
56
57 Input: aab Result: ** accepted **
58
59 Input: aba Result: ** accepted **
60
61 Input: baa Result: ** accepted **
62
63 Input: aaabb Result: ** accepted **
64
65 Input: aabab Result: ** accepted **
66
```

Figure 1. Commands to Compile, Link, & Run Lab 07 (Part 2 of 3)

```
67 Input: aabba Result: ** accepted **
68
69 Input: abaab Result: ** accepted **
70
71 Input: ababa Result: ** accepted **
72
73 Input: abbaa Result: ** accepted **
74
75 Input: baaab Result: ** accepted **
76
77 Input: baaba Result: ** accepted **
78
79 Input: babaa Result: ** accepted **
80
81 Input: bbaaa Result: ** accepted **
82
83 Input:      Result: -- NOT accepted --
84
85 Input: b Result: -- NOT accepted --
86
87 Input: ab Result: -- NOT accepted --
88
89 Input: aaba Result: -- NOT accepted --
90
91 Input: bb Result: -- NOT accepted --
92
93 Input: abab Result: -- NOT accepted --
94
95 Input: baaaa Result: -- NOT accepted --
96
97 Input: bbba Result: -- NOT accepted --
98
99 Input: aabb Result: -- NOT accepted --
100
101 Input: aaabbbb Result: -- NOT accepted --
102
103 Input: aaaabbbbb Result: -- NOT accepted --
104
105 Input: babb Result: -- NOT accepted --
106
107 newuser@csunix ~/4301/07> cat 00.dat | ./lab07 > my.out
108 newuser@csunix ~/4301/07> diff 00.out my.out
109 newuser@csunix ~/4301/07>
```

Figure 1. Commands to Compile, Link, & Run Lab 07 (Part 3 of 3)