

Quiz 1 and Quiz 2 Solutions

Quiz 1.1

1. For each term shown below put the letter of the phrase (on the accompany page) that best (of the available choices) describes the word. (no letter should be used more than once.)

a. Finite Automata

B. An abstract machine that recognizes a language specified by a regular expression

b. Regular Expression

J. A notation used to specify tokens

c. Scanner Generator

A. An example of a compiler writing tool that takes as input the specification of the tokens of the language. The specification of the tokens is done with regular expressions.

d. Fixed-Point Computations

P. Computations that terminate when they reach a state where further iterations produce the same answer

e. Symbol table

I. A data structure that allows information to be associated with identifiers

Quiz 1.1

f. Complete Finite Automata

N. A finite automata that explicitly includes all error transitions

g. Parser

F. Part of a compiler that determines if the input stream is a sentence in the source language

h. Scanner

D. Part of a compiler that groups characters into tokens

i. Context Free Grammar

E. A notation used to specify the syntax of a programming language or legal sequences of tokens in the programming language

j. Intermediate Representation

G. Code created by the front end of a compiler for later use by the back end of a compiler

Quiz 2.1

1. Systems that implement regular expressions (such as flex) often have operators that make writing regular expressions easier. In the following are some examples of these operations. For each item write a regular expression that uses only the basic operations I showed in the lecture (concatenation RS , union $R|S$ and closure R^*) as translations of the operations shown below. In the following the alphabet is $\{0,1,2,3,4,5,6,7,8,9\}$

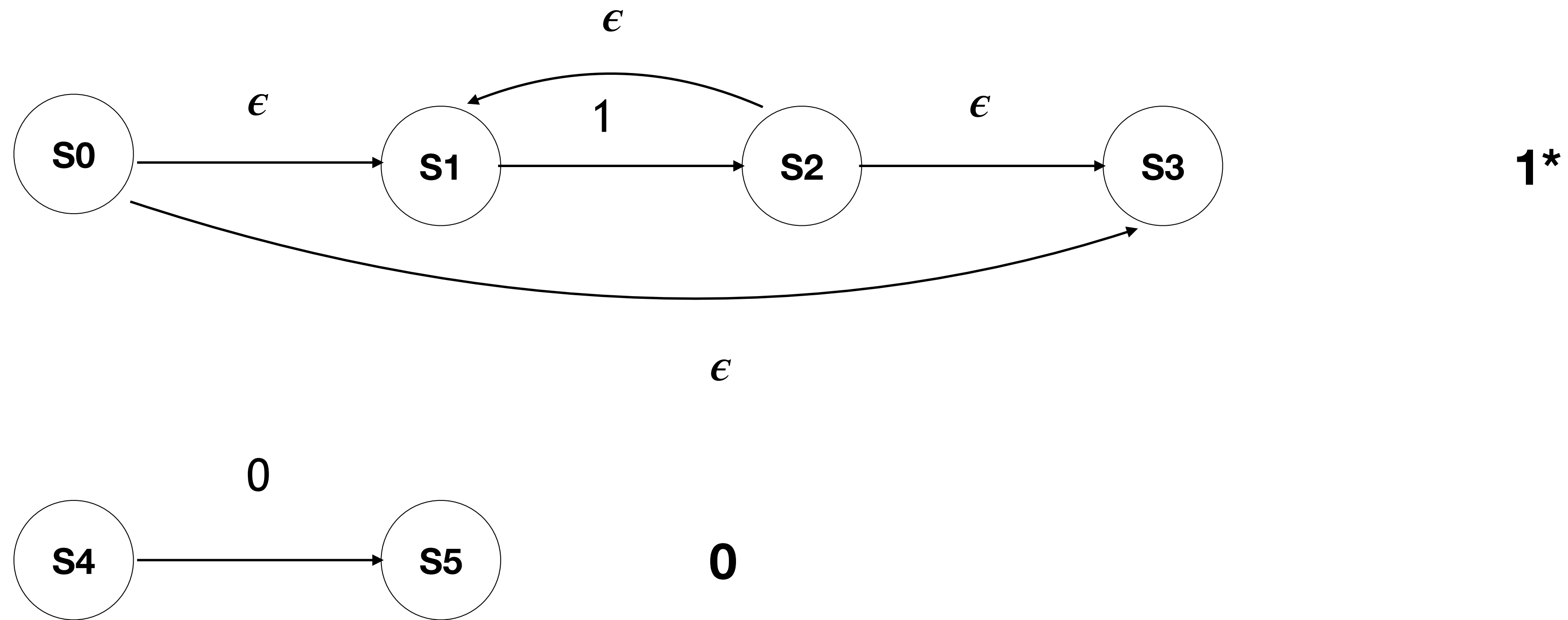
a. 1^+ is a regular expression that specifies the language $\{x \mid x \text{ is a sequence one or more } 1\text{s}\}$
 11^*

b. $[2-5]$ is a regular expression that specifies the language $\{2, 3, 4, 5\}$.
 $2|3|4|5$

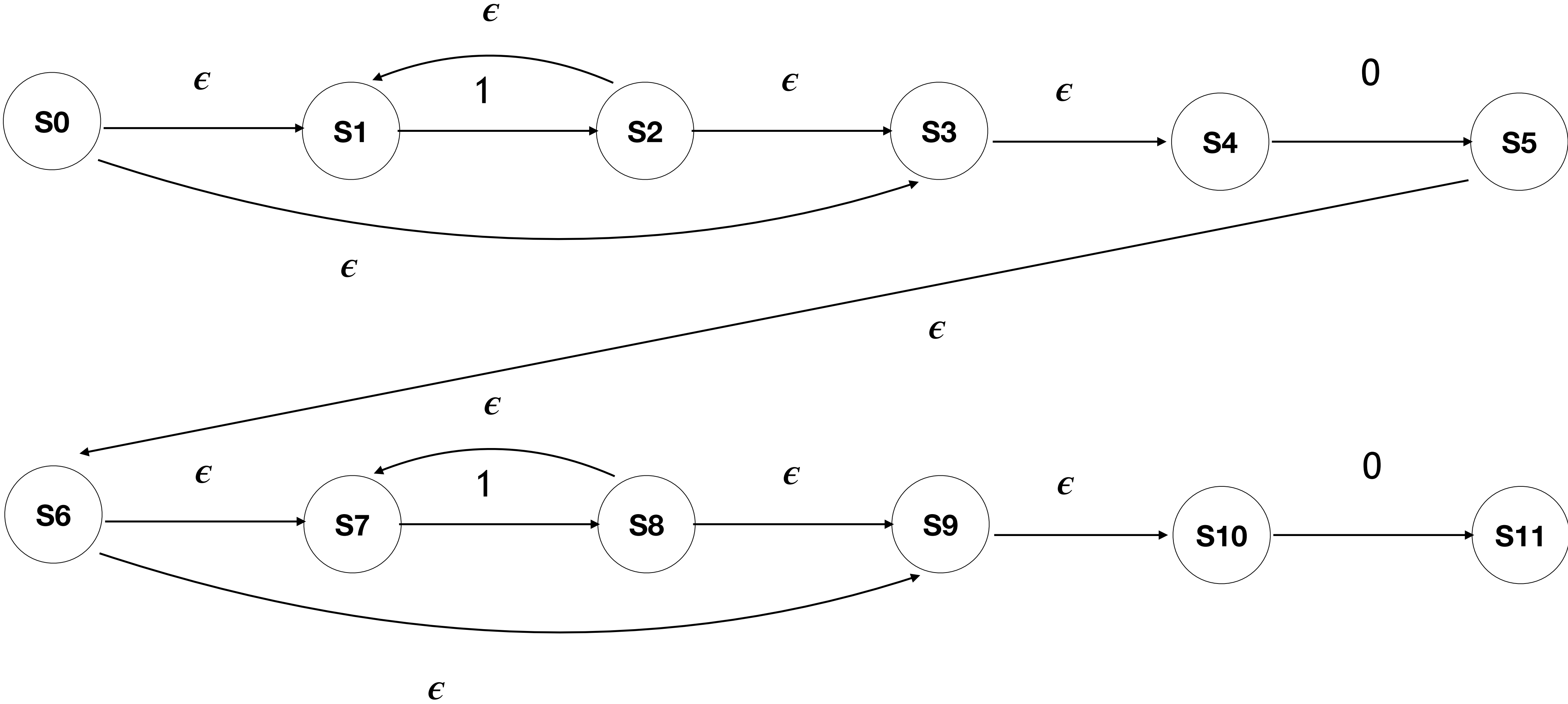
c. $[1-3]\{2,\}$ is a regular expression that specifies the language $\{x \mid x \text{ is a string consisting of any combination of } 1, 2 \text{ or } 3\text{s that is at least } 2 \text{ characters long}\}$. Some example strings are 11, 232, 3333, 12, 321, ...
 $(1|2|3)(1|2|3)^*$

d. $[\wedge 1-5]^+$ is a regular expression that specifies the language $\{x \mid x \text{ is a string containing characters } 6, 7, 8 \text{ or } 9 \text{ that is at least } 1 \text{ character long}\}$
 $(6|7|8|9)(6|7|8|9)^*$

Quiz 2.2



Quiz 2.2
(1*01*0)



Quiz 2.2

$(1^*01^*0)^*$

