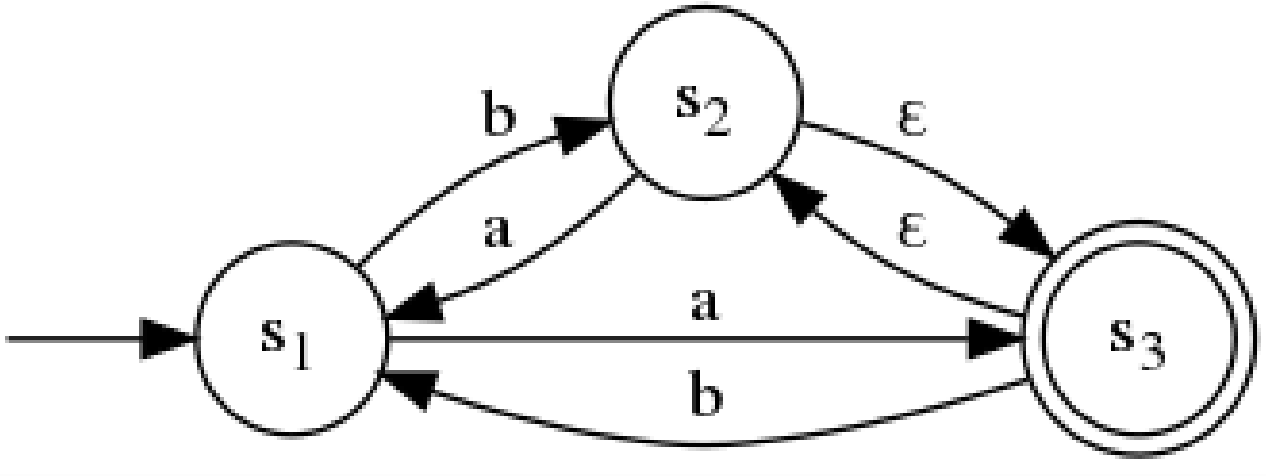
Check-In C4

Review: Syntactic Ambiguity



1. Draw out an equivalent finite automaton to the given one after applying the ε-elimination technique described in class.
2. Is the state machine an NFA (non-deterministic finite automaton) or DFA (deterministic finite automaton)?
3. If the machine is a DFA, create an NFA that recognizes the same language. If the machine is an NFA, create a DFA that recognizes the same language

Administrivia

On Written Work…

If you attend class when a written work is due, you DO NOT have to turn it in

(but you should still do it to make sure you're keeping up)

Administrivia

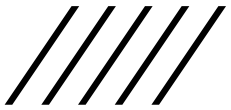
Office Hours TBA

- Will be posted on https://compilers.cool and posted on the class website

- However, Drew does have an “open door” policy – if available, you’re free to come ask a question

How will I know when Drew is available?

- You, maybe



Administrivia

The Drew Positioning System
https://drew.davidson.cool/where
also displayed outside Drew's office

If the sign (or website) says "available in Eaton Hall", feel free to stop by with a question

Corrrolary: if the sign says **not available** please don't disturb (even if the door is open)

Administrivia

Behold: The Project Oracle!

https://compilers.cool/oracles/o1

What's the format of output <x> ?

- Submit input to the Oracle

What's the token for character <y> ?

- Submit y to the Oracle

Administrivia

Behold: The Dragon Trials!

https://compilers.cool/trials/t1

Trial 1

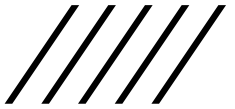
Due on February 6th 11:59 PM (Not accepted late).

Updates

None yet!

Overview

In Project 1, you *used* a scanner-generator (e.g., Flex). In this assignment, you will *create* a scanner-generator. Your scanner-generator should work much like Flex, though it will use a decidedly stripped down format.



FLIPPED WEDNESDAY

Written Work #1

Topics:

- Compiler Overview

Written Work #1: Question 1

What is the purpose of the lexer component of a compiler? Give an example of an input that GCC would flag for a lexical error.

Purpose of the lexer: character string to a token string

Lexer error: ☺ $ @

Non-lexer-error: ===

Written Work #1: Question 2

What is the purpose of the syntactic analysis component of a compiler? Give an example of an input that GCC would flag for a syntactic error.

sentences and paragraphs

purpose: makes sure that tokens are arranged in a valid way to make program constructs

syntax error: a = 3
↳ missing semicolon

Written Work #1: Question 3

What is the purpose of name analysis in a compiler? Give an example of an input that GCC would flag for failing name analysis.

purpose: bind identifiers to symbols

error: use of undeclared variable

```
int main() {
    a = 3;
}
```

↑ did not declare a

Written Work #1: Question 4

What is the purpose of type analysis in a compiler? Give an example of an input that GCC would flag for failing type analysis.

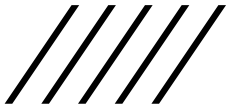
compatible data types

purpose: 1, determine the type of data
2, ensure that valid operations are performed for that type

error: `int a = 4 + 0.125;`

type error: tried to store float into int variable

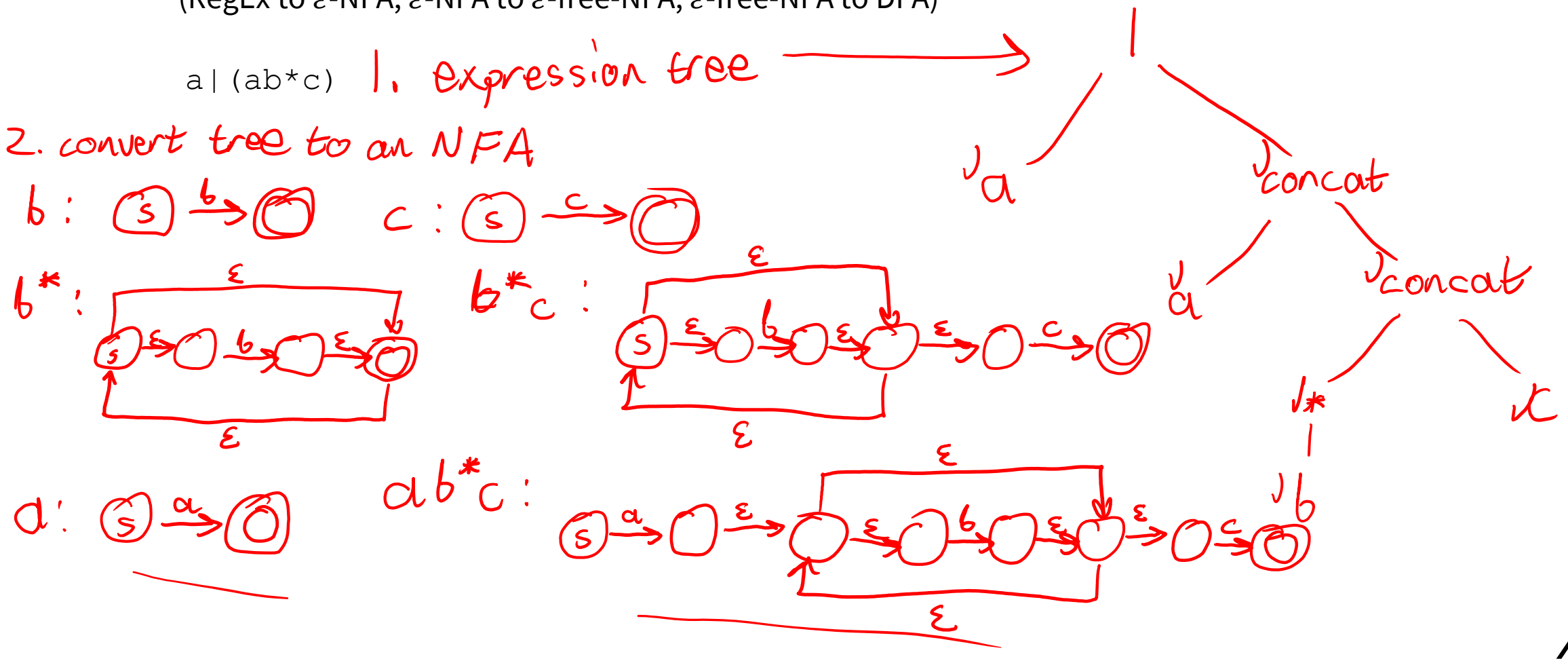
"1" + 3 = "13"

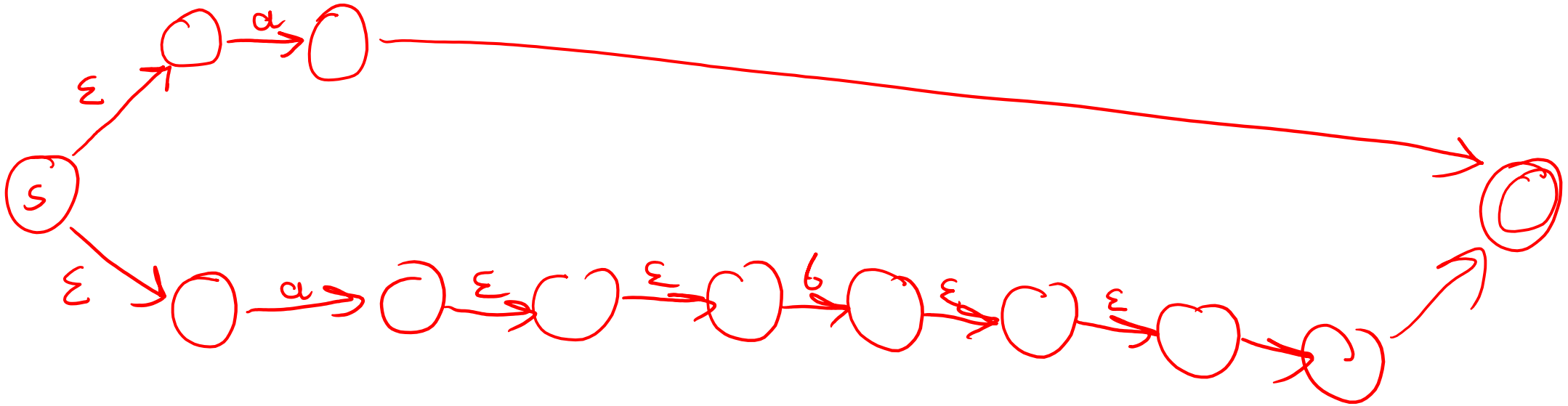


Bonus: Time Permitting

Convert the following regular expression to a DFA using the transformations discussed in class (RegEx to ε-NFA, ε-NFA to ε-free-NFA, ε-free-NFA to DFA)

`a|(ab*c)`

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