Programmer som Data - Assignment2

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1 PLC

2.4
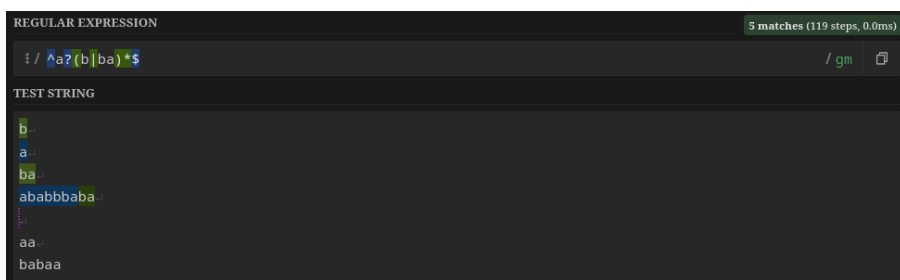
Refer to the file

2.5
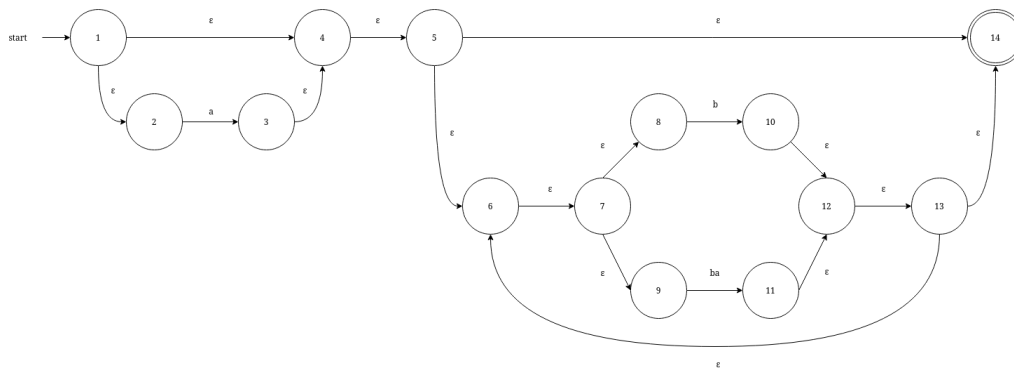
3.2

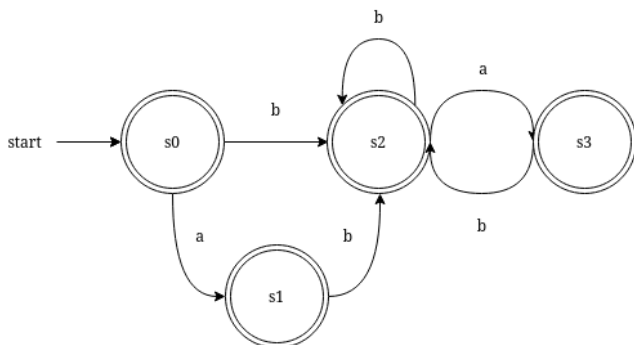**Regex:**

```
a?(b|ba)*
```


NFA:

DFA:

2 BCD 2.1

a:

    0*42

b:

    0*((?!42).)*

c:

    0*([1-9]\d{2,}|(?!40|41|42)[4-9]\d)

3   BCD 2.2

NFA:
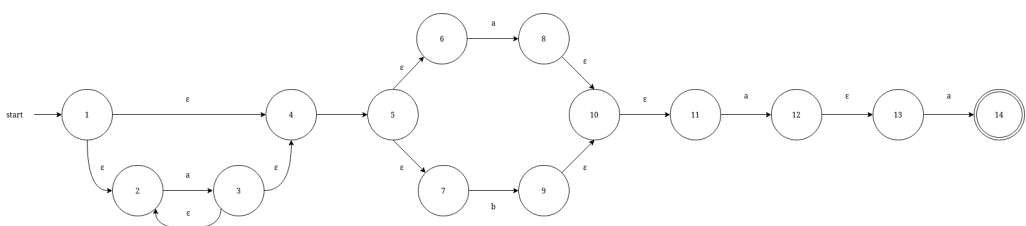
DFA:

NFA state	DFA state	a	b
{1,2,4,5,6,7}	1	2	5
{2,3,4,5,6,7,8,10,11}	2	3	5
{2,3,4,5,6,7,8,10,11,12}	3	4	5
{2,3,4,5,6,7,8,10,11,12,13,14}	4	4	5
{9,10,11}	5	6	X
{12,13}	6	7	X
{14}	7	X	X
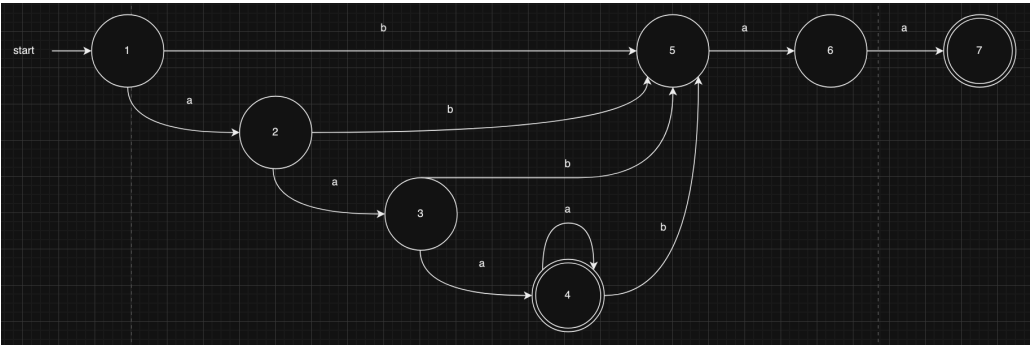
4 helloLex

4.1 Question 1

In *hello.fsl*, two regular expressions are present:

```
['0'-'9']
_
```

Their semantic values (in order):

```
LexBuffer<char>.LexemeString lexbuf
failwith "Lexer error: illegal symbol"
```

The first regular *[0-9]* matches with a single digit between 0 to 9. Its semantic value will be called upon match, capturing the input.

Second regular expression, which is a catch-all that will account for all other cases that does not satisfy the first regular expression. The associated value will be called upon match, raising an exception stating "Lexer error: illegal symbol".

4.2 Question 2

- *hello.fs* file.
- According to the output, we have 3 states.

4.3 Question 3

4.4 Question 4

*Refer to the file **hello2.fsl** in the folder **Exercise_HelloLex**.*

4.5   Question 5

```
~/Desktop/fsharp on ☁ brs@embankment.com took 2s
❯ sudo mono fslex.exe --unicode /Users/bastjansejberg/Documents/GitHub/CatSquish
-PAD-2023/assignment-1/Exercise_HelloLex/hello3.fsl -o hello3.fs
compiling to dfas (can take a while ?.)
10 states
writing output

~/Desktop/fsharp on ☁ brs@embankment.com
❯ fsharpc -r FsLexYacc.Runtime.dll hello3.fs
Microsoft (R) F# Compiler version 11.0.0.0 for F# 5.0
Copyright (c) Microsoft Corporation. All Rights Reserved.

~/Desktop/fsharp on ☁ brs@embankment.com took 7s
❯ mono hello3.exe
Hello World from FsLex!

Please pass a digit:
42.43
The lexer recognizes 42.43
```

*Refer to the file **hello3.fsl** in the folder **Exercise_HelloLex**.*