Lab 2

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Crafting a Compiler

3.3 Write regular expressions that define the strings recognized by the FAs in Figure 3.33 on page 107.

1. $(ab|ba)^*(aba|bab)^+$
2. $(a(b|(c)^+)(d)^*$
3. $(a(b)^+c)$

3.4

1. (a|(bc)*d)+

NFA STATE	DFA STATE	TYPE	a	b	c	d
{0,1,3,4,7}	A		B	C		D
{2,9,10,11,13,14,17,20}	B	accept	E	F		G
{5}	C				H	
{8,9,10,11,13,14,17,20}	D	accept	E	F		G
{10,11,12,13,14,17,19,20}	E	accept	E	F		G
{15}	F				I	
{10,11,13,14,17,18,19,20}	G	accept	E	F		G
{4,6,7}	H			C		D
{14,16,17}	I			F		G

2. ((0|1)*(2|3)+)|0011

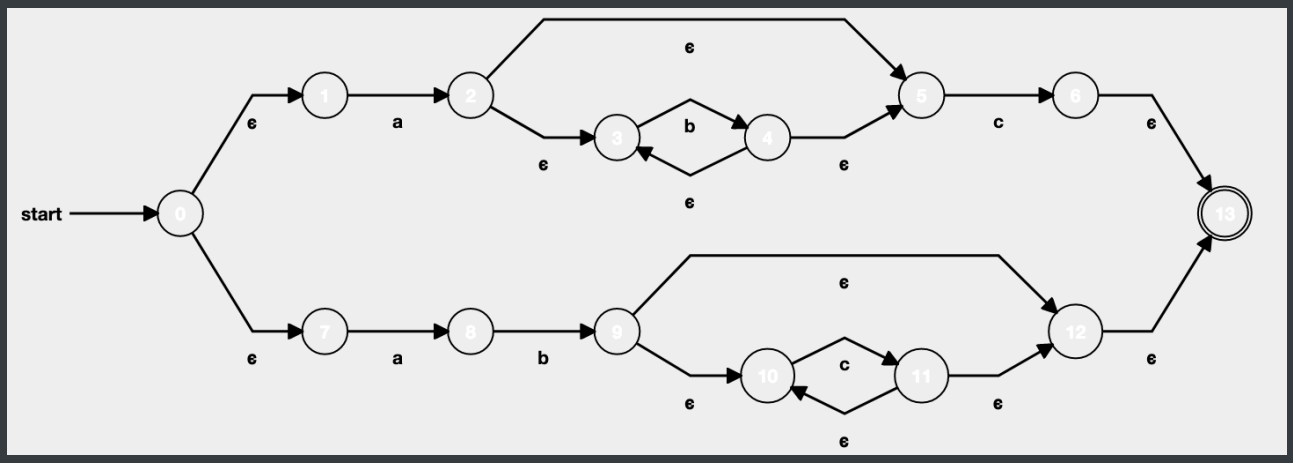
NFA STATE	DFA STATE	TYPE	0	1	2	3
{0,1,2,3,5,8,9,11,21}	A		B	C	D	E

{2,3,4,5,7,8,9,11,22}	B		F	C	D	E
{2,3,5,6,7,8,9,11}	C		G	C	D	E
{10,13,14,15,17,20,26}	D	accept			H	I
{12,13,14,15,17,20,26}	E	accept			H	I
{2,3,4,5,7,8,9,11,23}	F		G	J	D	E
{2,3,4,5,7,8,9,11}	G		G	C	D	E
{14,15,16,17,19,20,26}	H	accept			H	I
{14,15,17,18,19,20,26}	I	accept			H	I
{2,3,5,6,7,8,9,11,24}	J		G	K	D	E
{2,3,5,6,7,8,9,11,25,26}	K	accept	G	C	D	E

3. (aNot(a))*aaa

NFA STATE	DFA STATE	TYPE	N	a	o	t
{0,1,7}	A			B		
{2,8}	B		C	D		
{3}	C				E	
{9}	D			F		
{4}	E					G
{10}	F	accept				
{5}	G			H		
{1,6,7}	H			B		

3.15



Dragon

3.3.4 Most languages are case sensitive, so keywords can be written only one way, and the regular expressions describing their lexeme is very simple. However, some languages, like SQL, are case insensitive, so a keyword can be written either in lowercase or in uppercase, or in any mixture of cases. Thus, the SQL keyword SELECT can also be written select, Select, or sElEcT, for instance. Show how to write a regular expression for a keyword in a case insensitive language. Illustrate the idea by writing the expression for "select" in SQL.

```
# Regex...
[Ss][Ee][Ll][Ee][Cc][Tt]
# in python...
ignorecase = re.compile('select', re.IGNORECASE)
```