<u>CS 419</u>

Compiler

Project

Form

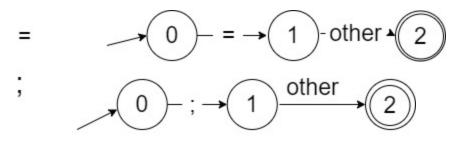
Project Idea:		
Project#3		
Language		•
Team Members NO#:	23	

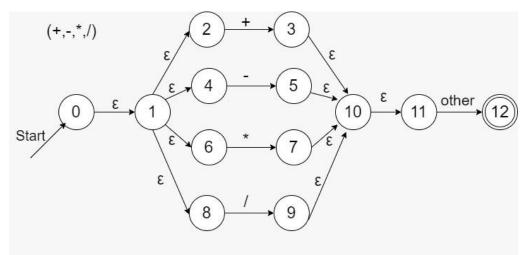
ID	Name	Level& Department	Section(Day- from-to)	Role (Lead/Member)	Grade
201900435	عبدالرحمن محمد فاروق فؤاد	3-Cs	Thursday 8 to 10 am	Leader Leader	
201900348	سلمی سمیر عبدالفتاح محمد	3-Cs	Wednesday 12 to 2pm	Member	
201900845	ممدوح عمر ممدوح عمر مشعل	3-Cs	Wednesday 2 to 4 pm	Member	
201900855	مهران اشرف محمد مصطفی	3-Cs	Wednesday 2 to 4 pm	Member	
201900500	عمر احمد عبدالعزيز يونس	3-Cs	Thursday 8 to 10 am	Member	
201900117	ادهم سيد محمد توفيق	3-Cs	Wednesday 10am to 12 pm	Member	
201900362	سيف الدين احمد سيف	3-Cs	Wednesday 10am to 12 pm	Member	

Regular Expression, Finite automata and Conversion from RegX to NFA, NFA to DFA:

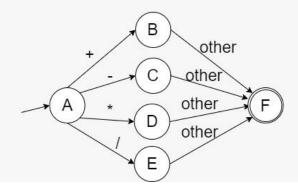
$$\begin{array}{c} \mathsf{RE} \longrightarrow \mathsf{DFA} \\ \mathsf{Type} \longrightarrow 0 - \mathsf{T} \longrightarrow 1 - \mathsf{y} \longrightarrow 2 - \mathsf{p} \longrightarrow 3 - \mathsf{e} \longrightarrow 4 \text{ other } \checkmark 5 \\ \mathsf{Infer} \longrightarrow 0 - \mathsf{I} \longrightarrow 1 - \mathsf{n} \longrightarrow 2 - \mathsf{f} \longrightarrow 3 - \mathsf{e} \longrightarrow 4 - \mathsf{r} \longrightarrow 5 \text{ other } \checkmark 6 \\ \mathsf{If} \longrightarrow 0 - \mathsf{I} \longrightarrow 1 - \mathsf{I} - \mathsf{f} \longrightarrow 2 \text{ other } \checkmark 3 \\ \mathsf{Else} \longrightarrow 0 - \mathsf{E} \longrightarrow 1 - \mathsf{I} - \mathsf{f} \longrightarrow 2 \text{ other } \checkmark 3 \\ \mathsf{Else} \longrightarrow 0 - \mathsf{E} \longrightarrow 1 - \mathsf{I} - \mathsf{p} \longrightarrow 2 - \mathsf{o} \longrightarrow 3 - \mathsf{k} \longrightarrow 4 \text{ other } \checkmark 5 \\ \mathsf{Ipok} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{i} \longrightarrow 2 - \mathsf{p} \longrightarrow 3 - \mathsf{o} \longrightarrow 4 - \mathsf{k} \longrightarrow 5 \text{ other } \checkmark 6 \\ \mathsf{Sipok} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{e} \longrightarrow 2 - \mathsf{q} \longrightarrow 3 - \mathsf{k} \longrightarrow 4 - \mathsf{f} \longrightarrow 6 - \mathsf{c} \longrightarrow 7 - \mathsf{e} \longrightarrow 8 \text{ other } \checkmark 9 \\ \mathsf{Ipokf} \longrightarrow 0 - \mathsf{I} \longrightarrow 1 - \mathsf{p} \longrightarrow 2 - \mathsf{o} \longrightarrow 3 - \mathsf{k} \longrightarrow 4 - \mathsf{f} \longrightarrow 6 - \mathsf{o} \longrightarrow 6 - \mathsf{c} \longrightarrow 7 - \mathsf{e} \longrightarrow 8 \text{ other } \checkmark 9 \\ \mathsf{Sipokf} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{i} \longrightarrow 2 - \mathsf{p} \longrightarrow 3 - \mathsf{o} \longrightarrow 4 - \mathsf{k} \longrightarrow 5 - \mathsf{f} \longrightarrow 6 - \mathsf{c} \longrightarrow 7 - \mathsf{e} \longrightarrow 8 \text{ other } \checkmark 9 \\ \mathsf{Sipokf} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{i} \longrightarrow 2 - \mathsf{p} \longrightarrow 3 - \mathsf{o} \longrightarrow 4 - \mathsf{k} \longrightarrow 5 - \mathsf{f} \longrightarrow 6 - \mathsf{o} \longrightarrow 6 - \mathsf{c} \longrightarrow 7 - \mathsf{s} \longrightarrow 8 - \mathsf{s} \longrightarrow 9 \text{ other } \checkmark 10 \\ \mathsf{Rational} \longrightarrow 0 - \mathsf{R} \longrightarrow 1 - \mathsf{a} \longrightarrow 2 - \mathsf{l} \longrightarrow 3 - \mathsf{l} \longrightarrow 4 - \mathsf{o} \longrightarrow 5 - \mathsf{n} \longrightarrow 6 - \mathsf{a} \longrightarrow 7 - \mathsf{l} \longrightarrow 8 \text{ other } \checkmark 9 \\ \mathsf{Endthis} \longrightarrow 0 - \mathsf{E} \longrightarrow 1 - \mathsf{n} \longrightarrow 2 - \mathsf{d} \longrightarrow 3 - \mathsf{l} \longrightarrow 4 - \mathsf{o} \longrightarrow 6 - \mathsf{l} \longrightarrow 6 - \mathsf{l} \longrightarrow 7 - \mathsf{l} \longrightarrow 8 \text{ other } \char 10 \\ \mathsf{Nvee} \longrightarrow 0 - \mathsf{k} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Respondwith} \longrightarrow 0 - \mathsf{R} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 - \mathsf{r} \longrightarrow 4 \text{ other } \backsim 6 \\ \mathsf{Scan} \longrightarrow 0 - \mathsf{S} \longrightarrow 1 - \mathsf{r} \longrightarrow 2 - \mathsf{e} \longrightarrow 3 -$$

Require
$$\longrightarrow 0$$
 - R $\rightarrow 1$ - e $\rightarrow 2$ - q $\rightarrow 3$ - u $\rightarrow 4$ - i $\rightarrow 5$ - r $\rightarrow 6$ - e $\rightarrow 7$ - other $\stackrel{\bullet}{\bullet}$ 8

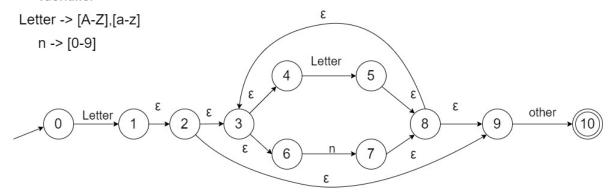




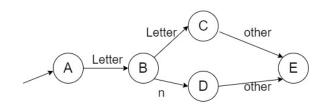
	NFA State DFA State		
{0}	{0,1,2,4,6,8}		
{3}	{3,10,11} B		
{5}	{5,10,11}	С	
{7}	{7,10,11}	D	
{9}	{9,10,11}	E	
{12}	{12}	F	



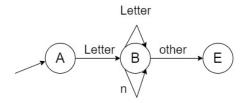
Identifier

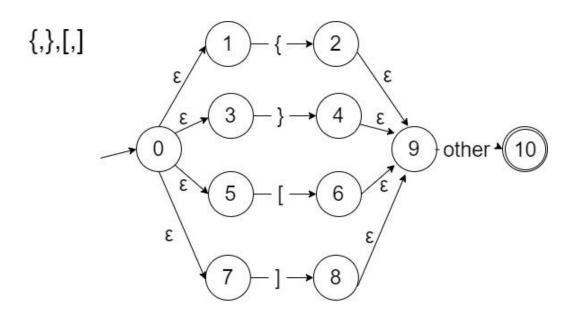


	NFA State	DFA State
{0}	{0}	Α
{1}	{1,2,3,4,6,9}	В
{5}	{5,8,9}	С
{7}	{7,8,9}	D
{10}	{10}	E

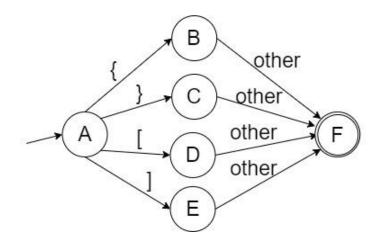


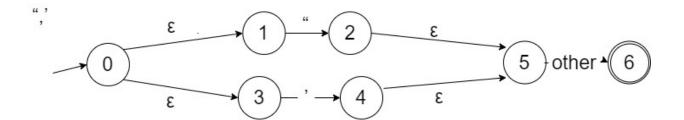
Minimizing the Number of States



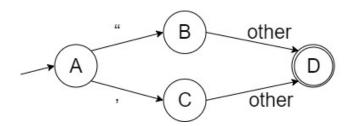


(0,1,3,5,7) {2,9} {4,9}	A B C
{4,9}	С
{6,9}	D
{8,9} E	
{10}	F
	{8,9}



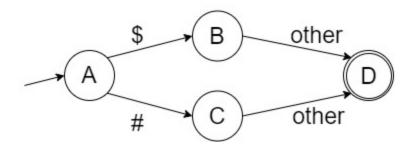


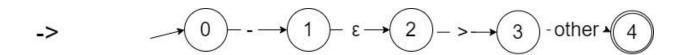
		NFA State	DFA State
	{0}	{0,1,3}	А
[A,"]	{2}	{2,5}	В
[A,']	{4}	{4,5}	С
	{6}	{6}	D



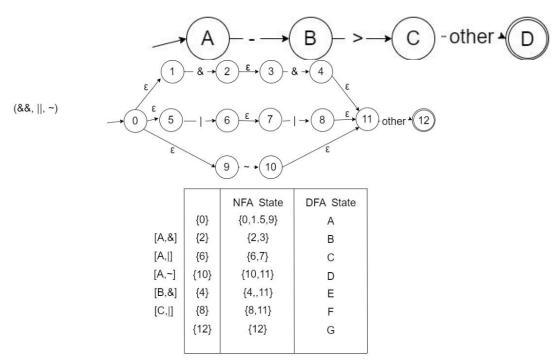
|*| 0 1 5other 6 6

		NFA State	DFA State
	{0}	{0,1,3}	Α
[A, \$]	{2}	{2,5}	В
[A,#]	{4}	{4,5}	С
	{6}	{6}	D

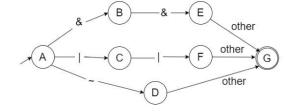


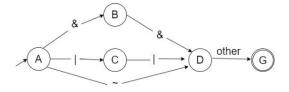


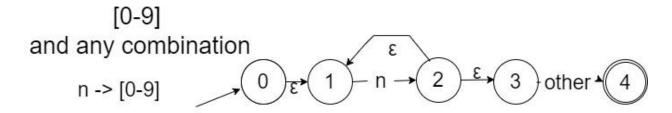
61			
>		NFA State	DFA State
	{0}	{0}	А
[A,-]	{1}	{1,2}	В
[A,>]	{3}	{3}	С
	{4}	{4}	D



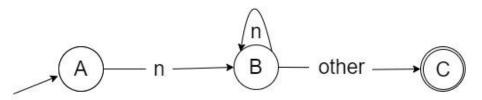
Minimizing the Number of States



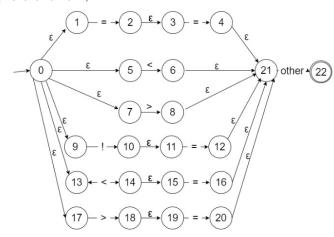




	NFA State	DFA State
{0}	{0,1}	Α
{2}	{1,2,3}	В
{4}	{4}	С



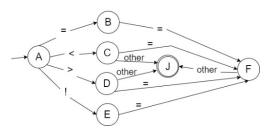
(==, <, >, !=, <=, >=)

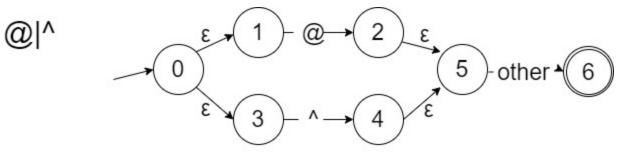


= → B — = → F	other
	other
$A \hookrightarrow C = G$	other
D other O	other
i H	other
E = 1	

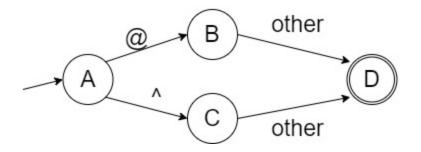
		NFA State	DFA State
	{0}	{0,1,5,7,9,13,17}	Α
[A,=]	{2}	{2,3}	В
[A,<]	{6,14}	{6,14,15.21}	С
[A,>]	{8,18}	{8,18,19,21}	D
[A,!]	{10}	{10,,11}	E
[B,=]	{4}	{4,21}	F
[C,=]	{16}	{16,21}	G
[D,=]	{20}	{20,,21}	н
[E,=]	{12}	{12,21}	1
	{22}	{22}	J

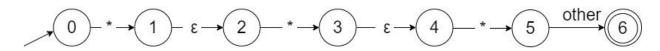
Minimizing the Number of States



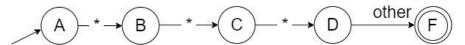


		NFA State	DFA State
	{0}	{0,1,3}	А
[A,@]	{2}	{2,5}	В
[A,^]	{4}	{4,5}	С
	{6}	{6}	D





	NFA State	DFA State
{0}	{0}	А
{1}	{1.2}	В
{3}	{3,4}	С
{5}	{5}	D
{6}	{6}	F



 $0 \leftarrow 1 - \epsilon \rightarrow 2 - l \rightarrow 3$ other 4

	NFA State	DFA State
{0}	{0}	A
{1}	{1.2}	В
{3}	{3}	С
{4}	{4}	D

$$A - < \rightarrow B - / \rightarrow C$$
 other D

/>	$0 - 1 - 1 - \varepsilon \rightarrow 2 - 3 \xrightarrow{\text{other}} 4$
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	NFA State	DFA State
{0}	{0}	A
{1}	{1.2}	В
{3}	{3}	С
{4}	{4}	D

$$A - I \rightarrow B \rightarrow C \xrightarrow{\text{other}} D$$

