

Compiler Construction

Assignment no 01

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1. Keywords

R.E:

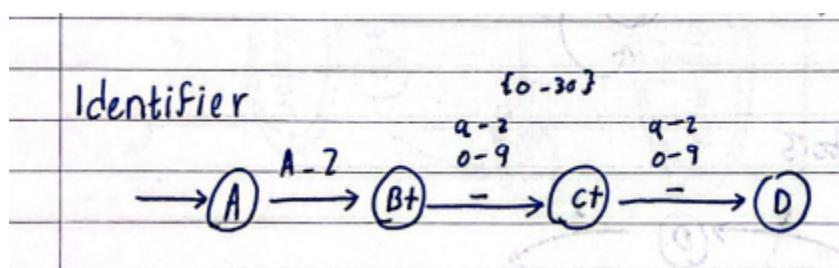
(start + finish + loop + condition + declare + output + input + function + return + break + continue + else)

2. Identifiers

R.E:

(A-Z)((a-z) + (0-9) + (_))^{0,30}

NFA:

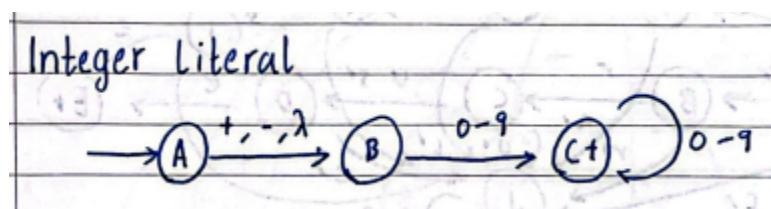


3. Integer Literals

R.E:

(+ | - | λ)(0-9)^+

NFA:

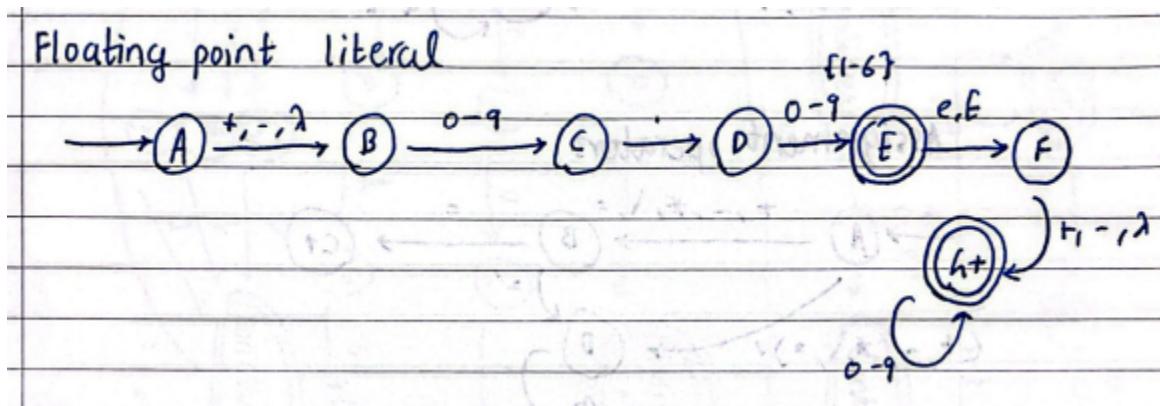


4. Floating-point Literals

R.E:

$(+ \mid - \mid \lambda)(0\text{-}9)^{+}(.\)(0\text{-}9)^{\{1,6\}} ((e + E)(+ \mid - \mid \lambda)(0\text{-}9)^{+})^{+}$

NFA:



5. String Literals

R.E:

$(")([^"\\"\\n] + (\\"))(" + \mid + n + t + r))^*("$

6. Char Literals

R.E:

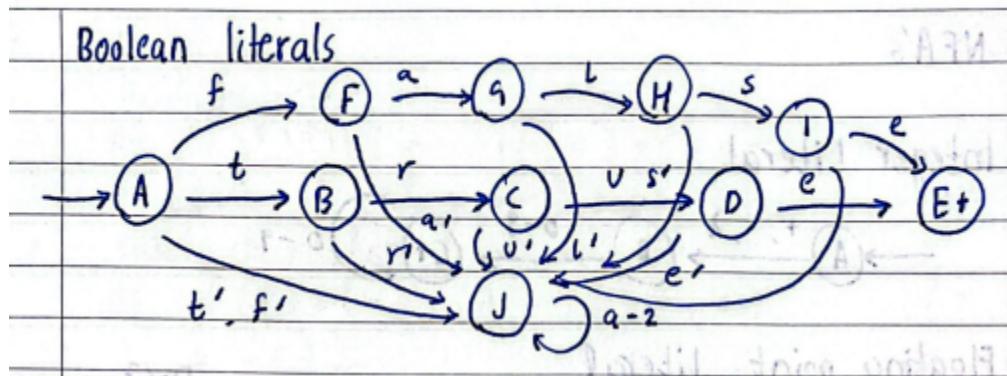
$(')([^"\\"\\n] + (\\"))(' + \mid + n + t + r))(')$

7. Boolean Literals

R.E:

(true + false)

NFA:



8. Operators

R.E:

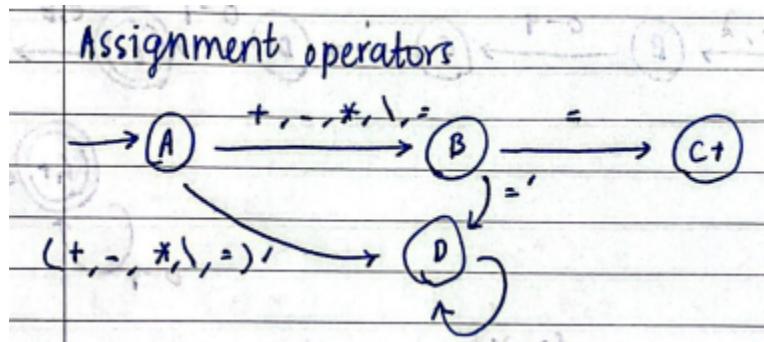
Multi-character:

$(**)$ + $(==)$ + $(!=)$ + $(<=)$ + $(>=)$ + $(\&\&)$ + $(||)$ + $(++)$ + $(--)$ + $(+=)$ +
 $(-=)$ + $(*=)$ + $(/=)$

Single-character:

$(+)$ + $(-)$ + $(*)$ + $(/)$ + $(\%)$ + $(<)$ + $(>)$ + $(!)$ + $(=)$

NFA:

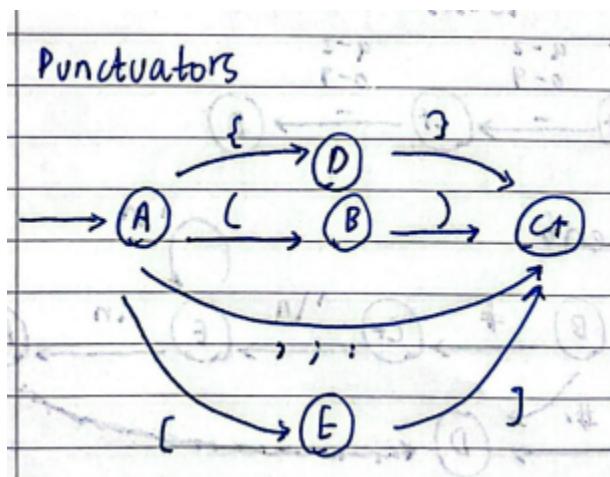


9. Punctuators

R.E:

(() + ()) + ({ }) + ([]) + ([,]) + ((,)) + ((;)) + ((:))

NFA:



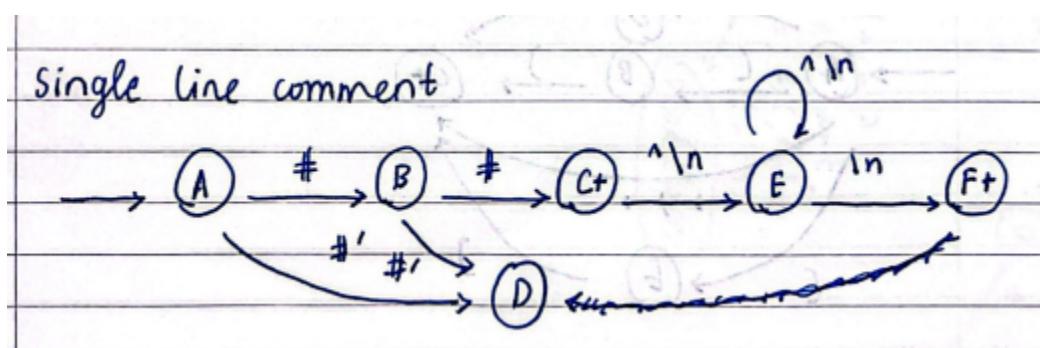
10. Comments

R.E:

Single-line Comment:

(##)([^n]^*)

NFA:

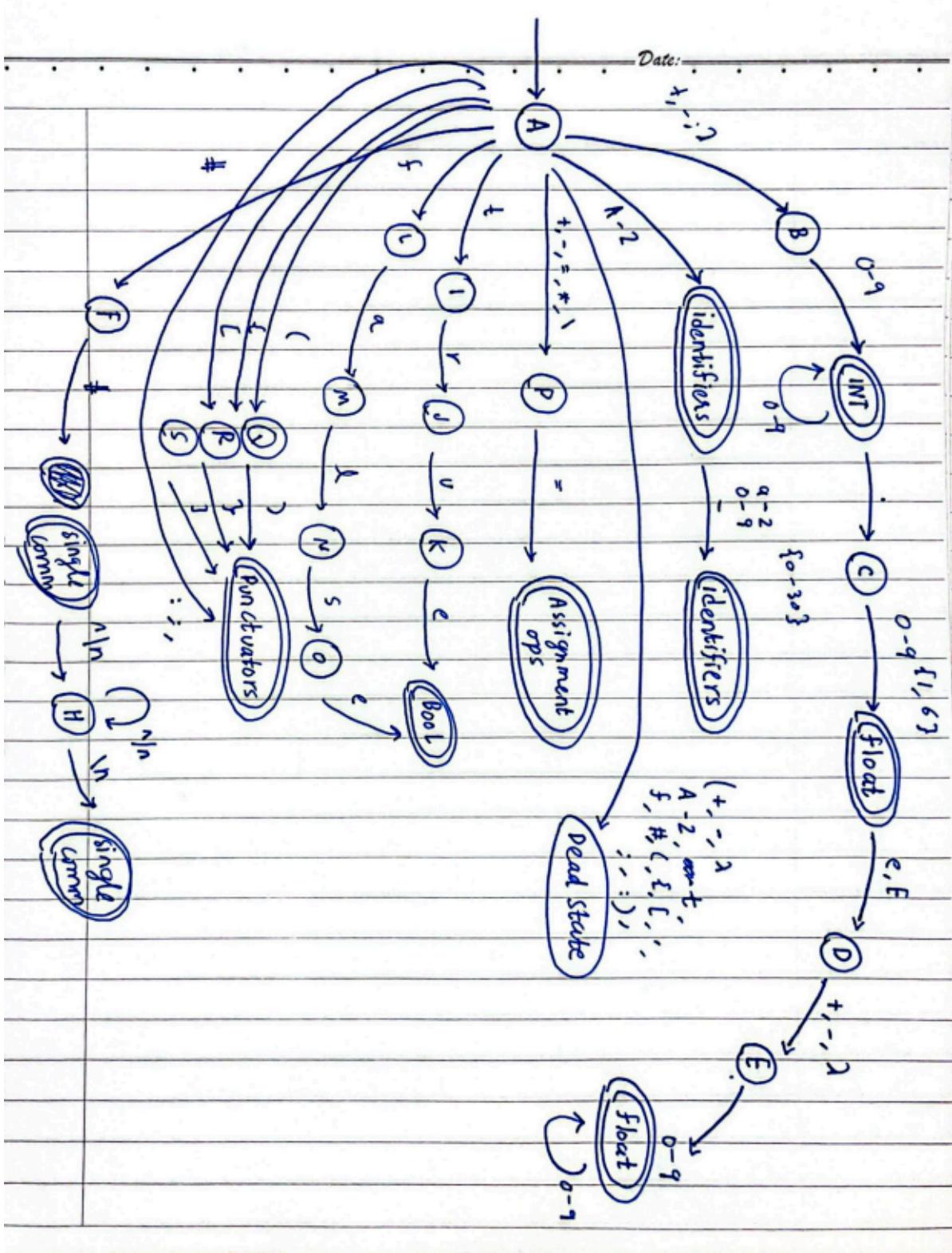


11. Whitespace

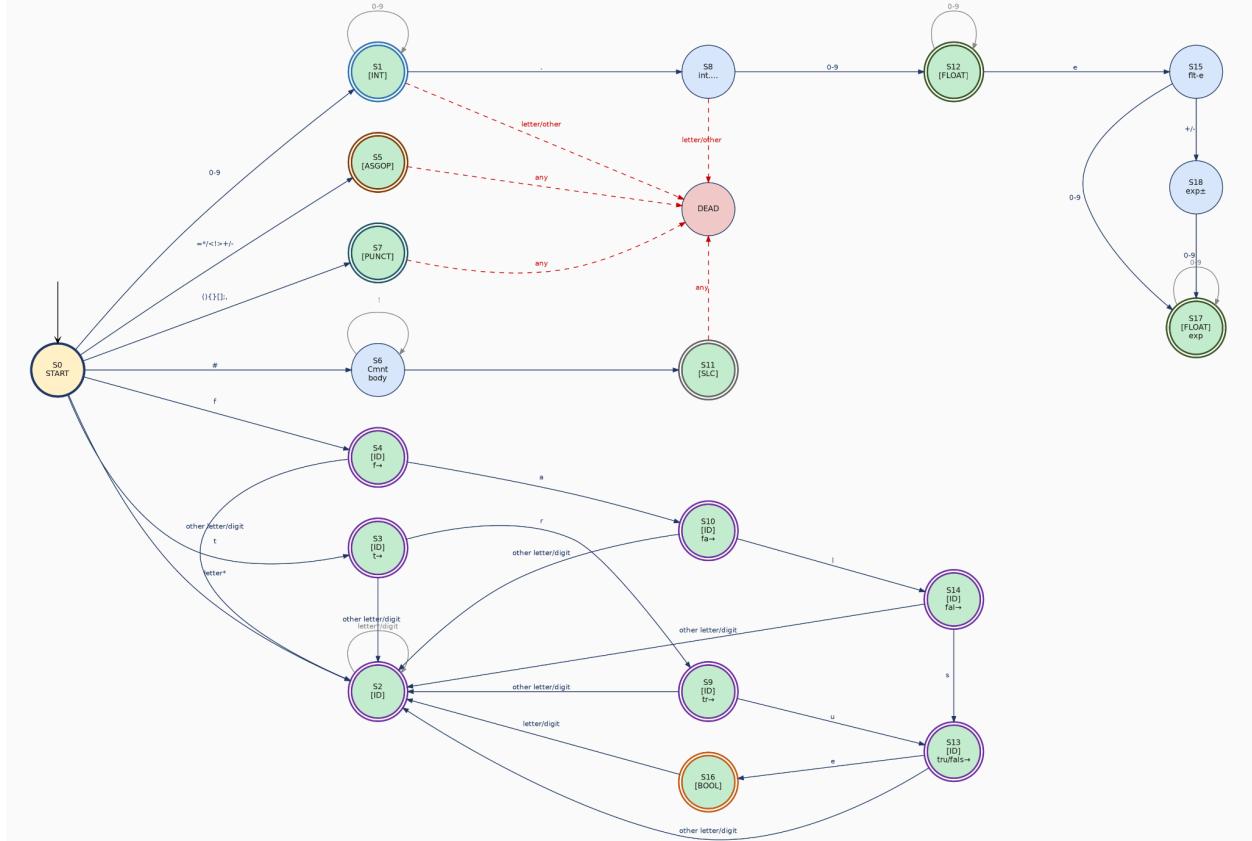
R.E:

((space) + (\t) + (\r) + (\n))^+

COMBINED NFA



MINIMISED DFA



TRANSITION TABLE

State	Token Category	digit (0-9)	letter*	t	r	u	e	f	a	l	s	.	+	/	#	\n	=	*	/	{	}	[]	;	other
S0	START	S1	S2	S3	S2	S2	S2	S4	S2	S2	S2	D E A D	S5	S6	D E A D	S5	S7	DEAD							
S1	INT	S1	DEAD	D E A D	S8	D E A D	DEAD																		
S2	ID	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	D E A D	DEAD												
S3	ID (t→)	S2	S2	S2	S9	S2	S2	S2	S2	S2	S2	D E A D	DEAD												
S4	ID (f→)	S2	S2	S2	S2	S2	S2	S2	S1 0	S2	S2	D E A D	DEAD												

