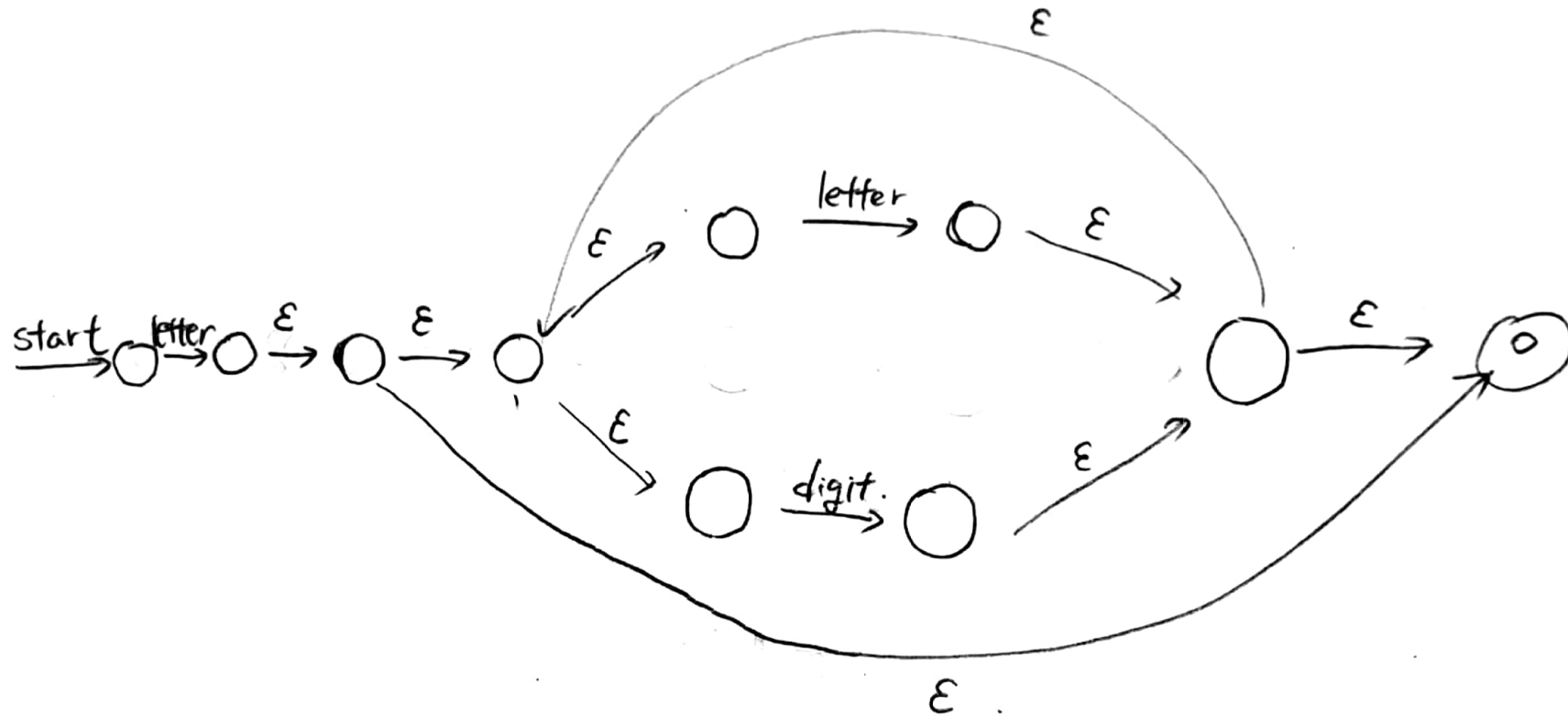


TEAM 3 김세진 (20200453), 김은솔 (20201501)

NFA ID: letter (letter | digit)*

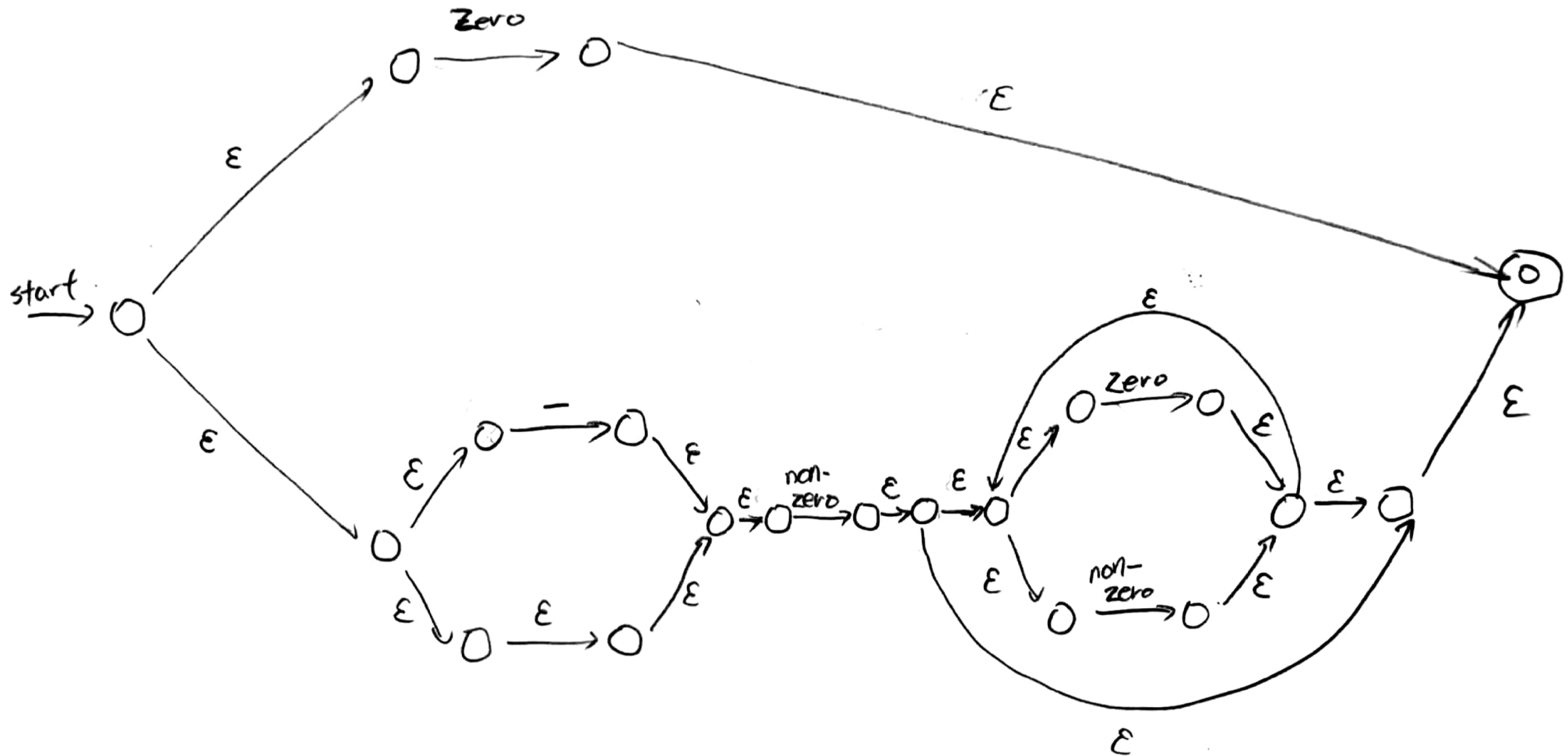
digit = 0/1/2/3/4/5/6/7/8/9

letter: a/b/c.../z/A/B/C.../Z



NFA INT : $zero | ((- | \epsilon) non-zero (zero | non-zero)^*)$

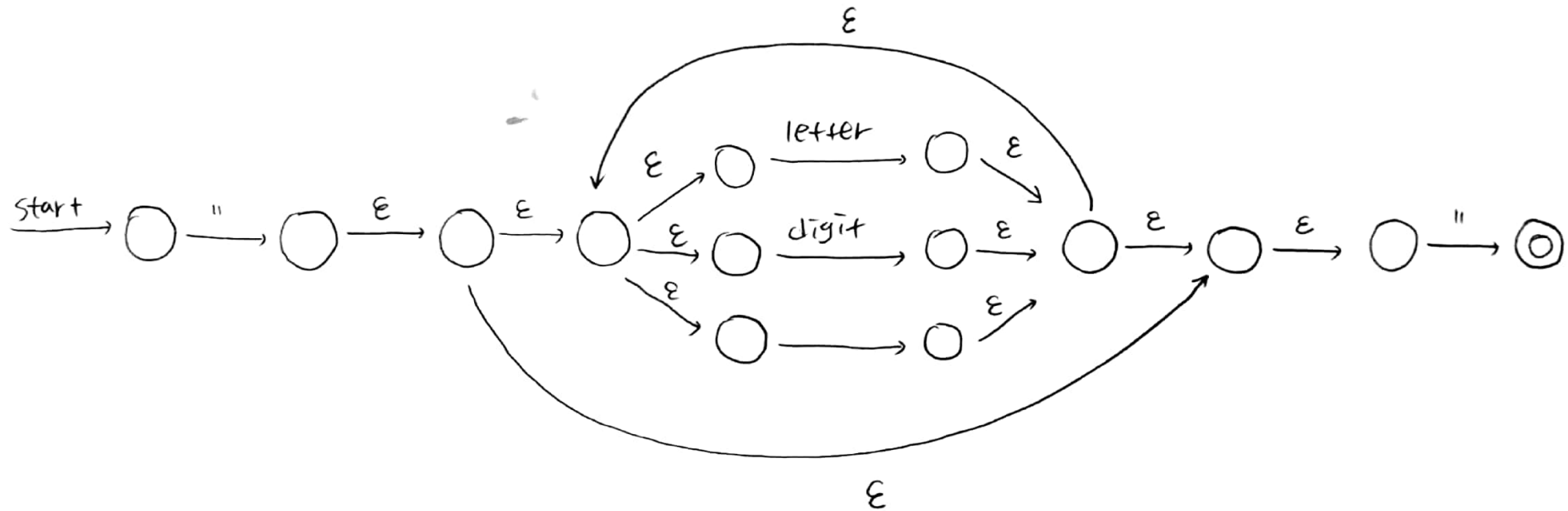
non-zero: 1|2|3|4|5|6|7|8|9



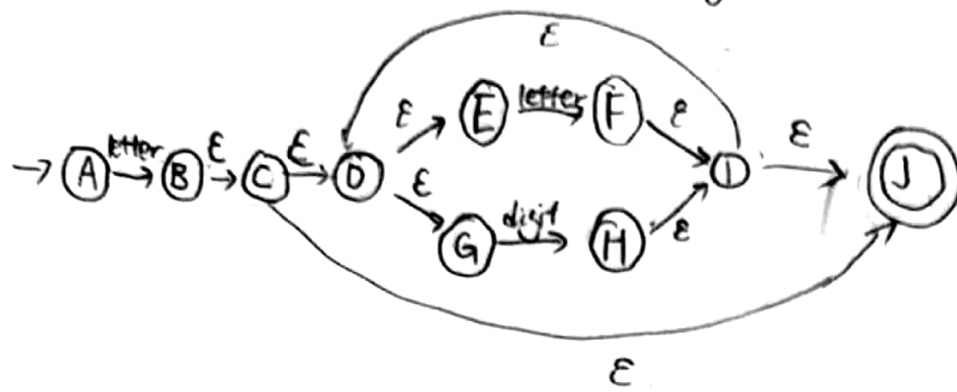
NFA STRING: "(letter|digit)*"

letter: a|b|c|...|z|A|B|C|...|Z

digit: 0|1|2|3|4|5|6|7|8|9



DFA ID: letter (letter | digit)*



$$T_0 = \epsilon\text{-closure}(A) = \{A\}$$

$$T_1 = \epsilon\text{-closure}(\delta(T_0, \text{letter})) = \{B, C, D, E, G, J\}, \epsilon\text{-closure}(\delta(T_0, \text{digit})) = \emptyset$$

$$T_2 = \epsilon\text{-closure}(\delta(T_1, \text{letter})) = \{D, E, G, F, I, J\}$$

$$T_3 = \epsilon\text{-closure}(\delta(T_1, \text{digit})) = \{D, E, G, H, I, J\}$$

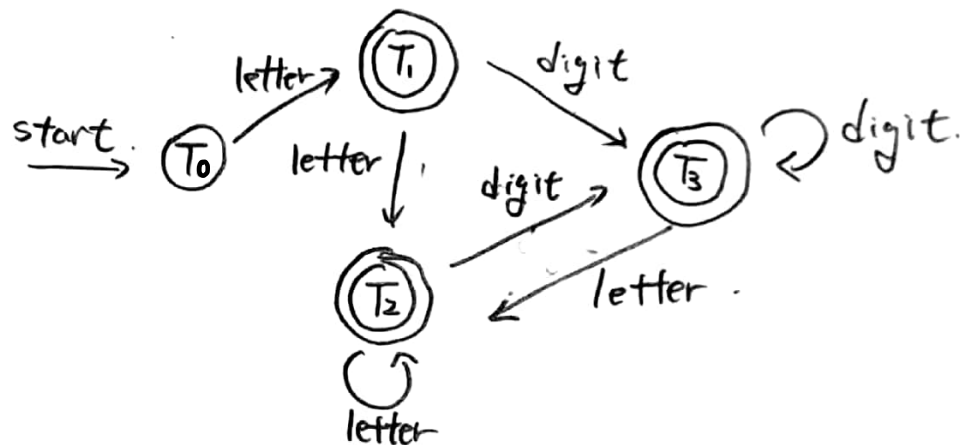
$$\epsilon\text{-closure}(\delta(T_2, \text{letter})) = \{D, E, G, F, I, J\} = T_2$$

$$\epsilon\text{-closure}(\delta(T_2, \text{digit})) = \{D, E, G, H, I, J\} = T_3$$

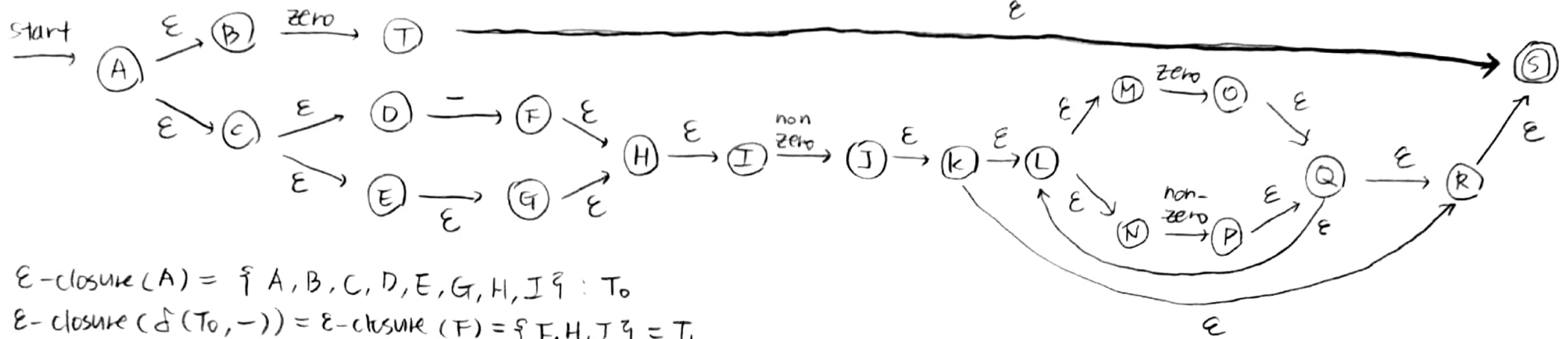
$$\epsilon\text{-closure}(\delta(T_3, \text{letter})) = \{D, E, G, F, I, J\} = T_2$$

$$\epsilon\text{-closure}(\delta(T_3, \text{digit})) = \{D, E, G, H, I, J\} = T_3$$

	letter	digit
T_0	T_1	\emptyset
T_1	T_2	T_3
T_2	T_2	T_3
T_3	T_2	T_3



DFA: INT zero | ((-|ε) non-zero (zero | non-zero)*) zero → z non-zero → nz



ϵ -closure(A) = {A, B, C, D, E, G, H, I} : T_0

ϵ -closure($\delta(T_0, -)$) = ϵ -closure(F) = {F, H, I} = T_1

ϵ -closure($\delta(T_0, z)$) = ϵ -closure(T) = {T, S} : T_2

ϵ -closure($\delta(T_0, nz)$) = ϵ -closure(J) = {J, K, L, M, N, R, S} : T_3

ϵ -closure($\delta(T_1, -)$) = \emptyset ϵ -closure($\delta(T_1, z)$) = \emptyset

ϵ -closure($\delta(T_1, nz)$) = ϵ -closure(J) = T_3

ϵ -closure($\delta(T_2, -)$) = \emptyset ϵ -closure($\delta(T_2, z)$) = \emptyset ϵ -closure($\delta(T_2, nz)$) = \emptyset

ϵ -closure($\delta(T_3, -)$) = \emptyset

ϵ -closure($\delta(T_3, z)$) = ϵ -closure(O) = {O, Q, L, M, N, R, S} : T_4

ϵ -closure($\delta(T_3, nz)$) = ϵ -closure(P) = {Q, L, M, N, R, S, P} : T_5

ϵ -closure($\delta(T_4, -)$) = \emptyset

ϵ -closure($\delta(T_4, z)$) = ϵ -closure(O) = T_4

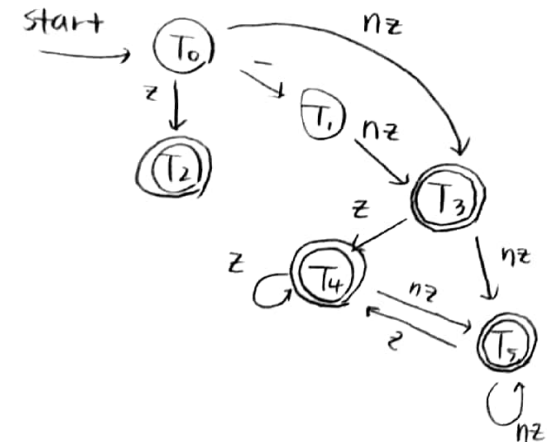
ϵ -closure($\delta(T_4, nz)$) = ϵ -closure(P) = T_5

ϵ -closure($\delta(T_5, -)$) = \emptyset

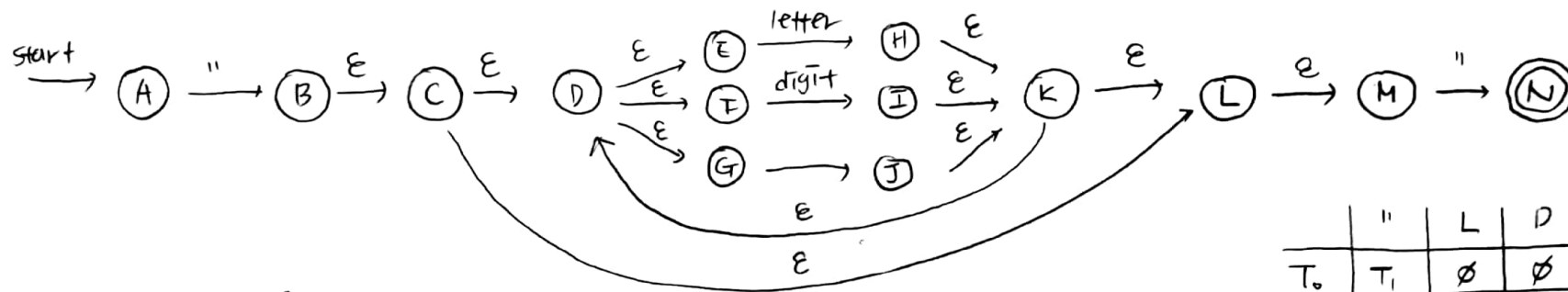
ϵ -closure($\delta(T_5, z)$) = ϵ -closure(O) = T_4

ϵ -closure($\delta(T_5, nz)$) = ϵ -closure(P) = T_5

	-	z	nz
T_0	T_1	T_2	T_3
T_1	\emptyset	\emptyset	T_3
(T_2)	\emptyset	\emptyset	\emptyset
(T_3)	\emptyset	T_4	T_5
(T_4)	\emptyset	T_4	T_5
(T_5)	\emptyset	T_4	T_5



DFA STRING "(letter|digit|)*" letter \rightarrow L digit \rightarrow D



	"	L	D	
T_0	T_1	\emptyset	\emptyset	\emptyset
T_1	T_2	T_3	T_4	T_5
T_2	\emptyset	\emptyset	\emptyset	\emptyset
T_3	T_2	T_3	T_4	T_5
T_4	T_2	T_3	T_4	T_5
T_5	T_2	T_3	T_4	T_5

$$E\text{-closure}(A) = \{A\} : T_0$$

$$E\text{-closure}(\delta(T_0, "(")) = E\text{-closure}(B) = \{B, C, D, E, F, G, L, M\} : T_1$$

$$E\text{-closure}(\delta(T_0, L)) = \emptyset \quad E\text{-closure}(\delta(T_0, D)) = \emptyset \quad E\text{-closure}(\delta(T_0, "|")) = \emptyset$$

$$E\text{-closure}(\delta(T_1, "(")) = E\text{-closure}(N) = \{N\} : T_2$$

$$E\text{-closure}(\delta(T_1, L)) = E\text{-closure}(H) = \{H, K, D, E, F, G, L, M\} : T_3$$

$$E\text{-closure}(\delta(T_1, D)) = E\text{-closure}(I) = \{I, K, D, E, F, G, L, M\} : T_4$$

$$E\text{-closure}(\delta(T_1, "|")) = E\text{-closure}(J) = \{J, K, D, E, F, G, L, M\} : T_5$$

$$E\text{-closure}(\delta(T_2, "(")) = \emptyset \quad E\text{-closure}(\delta(T_3, "(")) = E\text{-closure}(N) : T_2$$

$$E\text{-closure}(\delta(T_2, L)) = \emptyset \quad E\text{-closure}(\delta(T_3, L)) = E\text{-closure}(H) : T_3$$

$$E\text{-closure}(\delta(T_2, D)) = \emptyset \quad E\text{-closure}(\delta(T_3, D)) = E\text{-closure}(I) : T_4$$

$$E\text{-closure}(\delta(T_2, "|")) = \emptyset \quad E\text{-closure}(\delta(T_3, "|")) = E\text{-closure}(J) : T_5$$

$$E\text{-closure}(\delta(T_4, "(")) = E\text{-closure}(N) : T_2$$

$$E\text{-closure}(\delta(T_4, L)) = E\text{-closure}(H) : T_3$$

$$E\text{-closure}(\delta(T_4, D)) = E\text{-closure}(I) : T_4$$

$$E\text{-closure}(\delta(T_4, "|")) = E\text{-closure}(J) : T_5$$

$$E\text{-closure}(\delta(T_5, "(")) = E\text{-closure}(N) : T_2$$

$$E\text{-closure}(\delta(T_5, L)) = E\text{-closure}(H) : T_3$$

$$E\text{-closure}(\delta(T_5, D)) = E\text{-closure}(I) : T_4$$

$$E\text{-closure}(\delta(T_5, "|")) = E\text{-closure}(J) : T_5$$

