

Hunter Johnston

GRAMMAR:

ϵ = epsilon

$(++)$, $(--)$, $(-)$, $(+)$ are all one terminal, while (E) is not.

n = a number (neg or pos)

$E \rightarrow TEP$

$EP \rightarrow +TEP \mid -TEP \mid \epsilon$

$T \rightarrow FTP$

$TP \rightarrow *FTP \mid /FTP \mid \%FTP \mid \epsilon$

$F \rightarrow (+)FP \mid (-)FP \mid (++)FP \mid (--)FP \mid nFPP \mid (E)FPP$

$FP \rightarrow (++)FP \mid (--)FP \mid nFPP \mid (E)FPP$

$FPP \rightarrow (++)FPP \mid (--)FPP \mid \epsilon$

EPS, FIRST, FOLLOW, PREDICT sets:

$EPS(E) = F$

$EPS(EP) = T$

$EPS(T) = F$

$EPS(TP) = T$

$EPS(F) = F$

$EPS(FP) = F$

$EPS(FPP) = T$

$FIRST(E) = \{(+), (-), (++) , (--) , n, \{\}$

$FIRST(EP) = \{+, -\}$

$FIRST(T) = \{(+), (-), (++) , (--) , n, \{\}$

$FIRST(TP) = \{*, /, \%\}$

$FIRST(F) = \{(+), (-), (++) , (--) , n, \{\}$

$FIRST(FP) = \{(++) , (--) , n, \{\}$

$FIRST(FPP) = \{(++) , (--) \}$

$FOLLOW(E) = \{\}$

$FOLLOW(EP) = \{\}$

$FOLLOW(T) = \{+, -, \}$

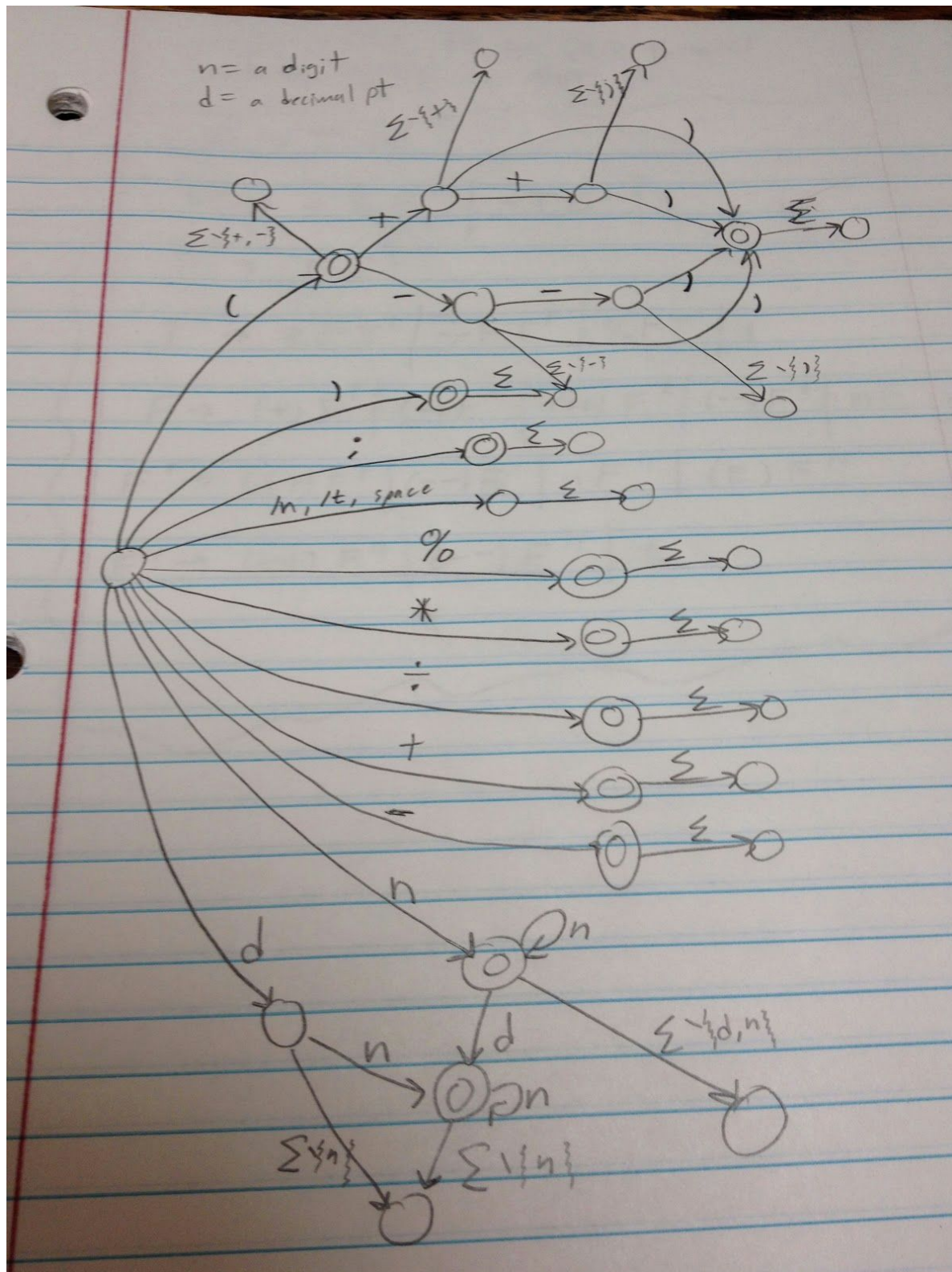
$FOLLOW(TP) = \{+, -, \}$

$FOLLOW(F) = \{*, /, \%, +, -, \}$

$\text{FOLLOW}(\text{FP}) = \{*, /, \%, +, -, \epsilon\}$
 $\text{FOLLOW}(\text{FPP}) = \{*, /, \%, +, -, \epsilon\}$

$\text{PREDICT}(\text{E} \rightarrow \text{TEP}) = \{(+), (-), (++) , (--) , \epsilon, \{\}$
 $\text{PREDICT}(\text{EP} \rightarrow +\text{TEP}) = \{+\}$
 $\text{PREDICT}(\text{EP} \rightarrow -\text{TEP}) = \{-\}$
 $\text{PREDICT}(\text{EP} \rightarrow \epsilon) = \{\}$
 $\text{PREDICT}(\text{T} \rightarrow \text{FTP}) = \{(+), (-), (++) , (--) , \epsilon, \{\}$
 $\text{PREDICT}(\text{TP} \rightarrow * \text{FTP}) = \{*\}$
 $\text{PREDICT}(\text{TP} \rightarrow / \text{FTP}) = \{/ \}$
 $\text{PREDICT}(\text{TP} \rightarrow \% \text{FTP}) = \{\%\}$
 $\text{PREDICT}(\text{TP} \rightarrow \epsilon) = \{+, -, \epsilon\}$
 $\text{PREDICT}(\text{F} \rightarrow (+) \text{FP}) = \{(+)\}$
 $\text{PREDICT}(\text{F} \rightarrow (-) \text{FP}) = \{(-)\}$
 $\text{PREDICT}(\text{F} \rightarrow (++) \text{FP}) = \{(++)\}$
 $\text{PREDICT}(\text{F} \rightarrow (--) \text{FP}) = \{(--)\}$
 $\text{PREDICT}(\text{F} \rightarrow \epsilon \text{FPP}) = \{\epsilon\}$
 $\text{PREDICT}(\text{F} \rightarrow (\epsilon) \text{FPP}) = \{\}$
 $\text{PREDICT}(\text{FP} \rightarrow (++) \text{FP}) = \{(++)\}$
 $\text{PREDICT}(\text{FP} \rightarrow (--) \text{FP}) = \{(--)\}$
 $\text{PREDICT}(\text{FP} \rightarrow \epsilon \text{FPP}) = \{\epsilon\}$
 $\text{PREDICT}(\text{FP} \rightarrow (\epsilon) \text{FPP}) = \{\}$
 $\text{PREDICT}(\text{FPP} \rightarrow (++) \text{FPP}) = \{(++)\}$
 $\text{PREDICT}(\text{FPP} \rightarrow (--) \text{FPP}) = \{(--)\}$
 $\text{PREDICT}(\text{FPP} \rightarrow \epsilon) = \{*, /, \%, +, -, \epsilon\}$

SCANNER DFA:



NOTE: insert arrows from each “trash” state back to itself with the whole alphabet as a transition