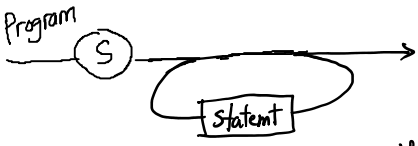
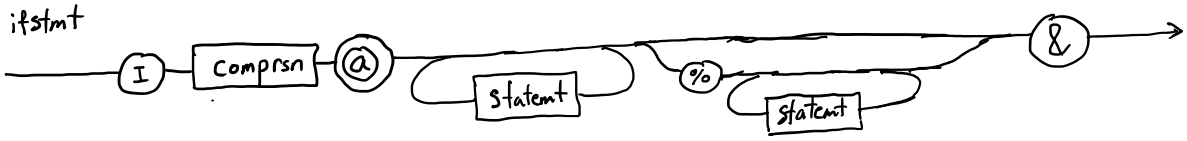
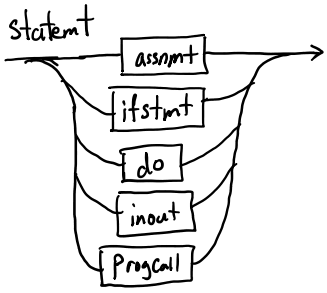
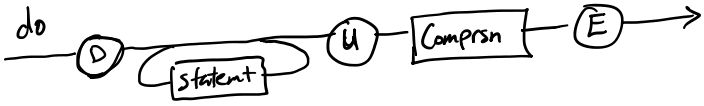
HW1 Syntax Diagram

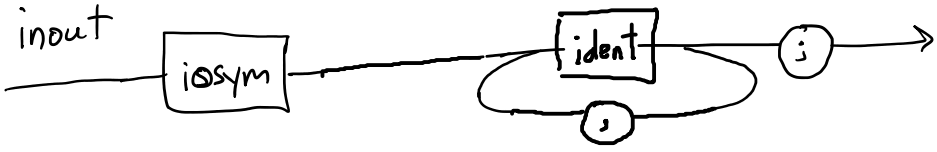
Thursday, February 21, 2019 12:14 PM

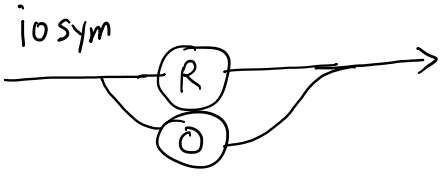


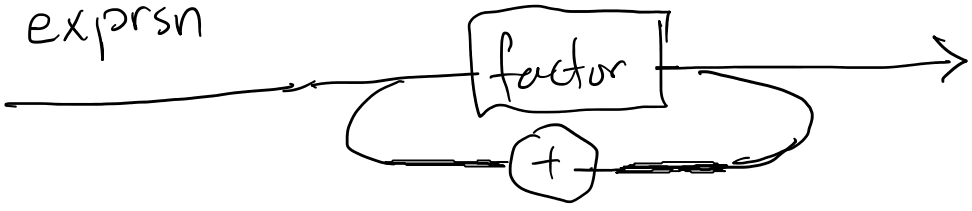


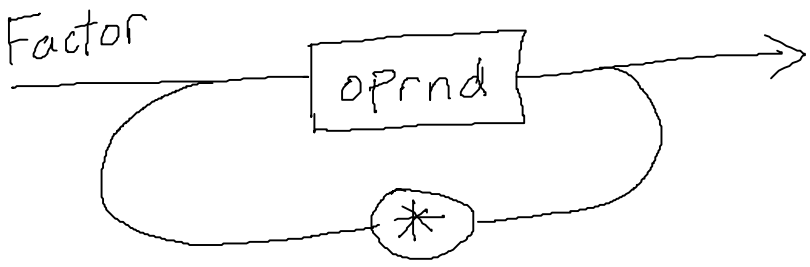


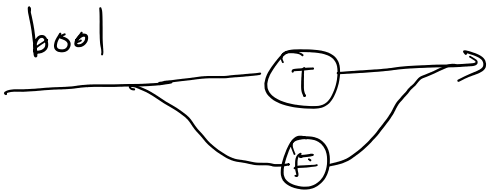


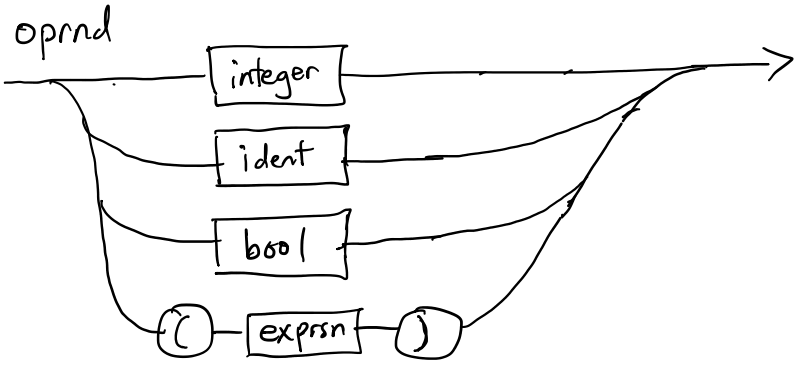




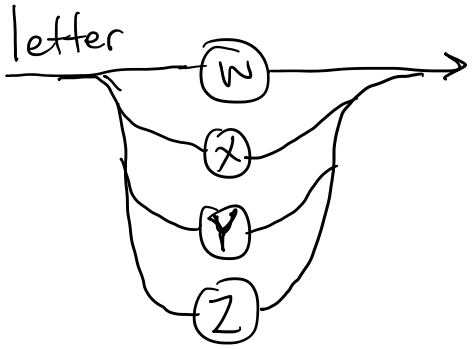


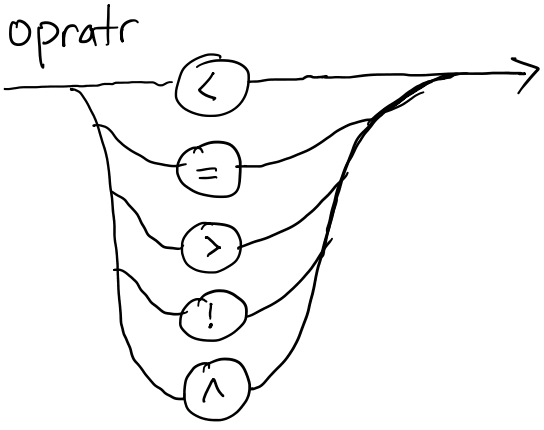

Factor
oprnd
*

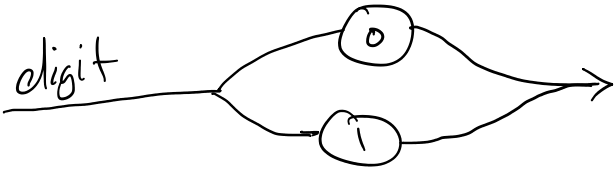

bool
T
F

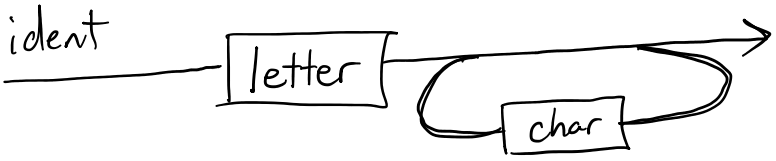

oprnd
integer
ident
bool
(
exprsn
)


integer
digit


letter
W
X
Y
Z


opratr
<
=
>
!
^


digit
0
1


ident
letter
char

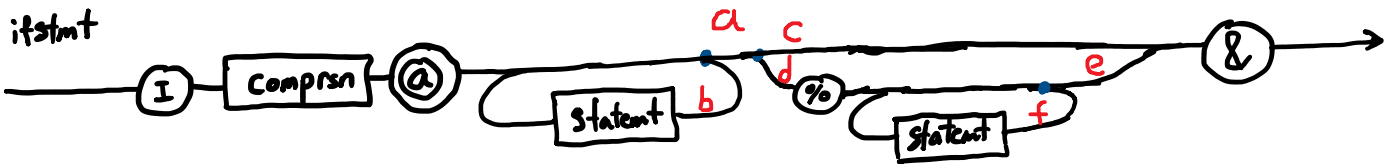

char
letter
digit

First n Follow ALL

Wednesday, February 27, 2019 9:02 PM

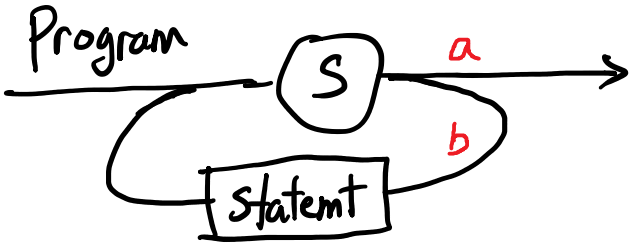
$first(bool) = \{T, F\}$
$first(digit) = \{0,1\}$
$first(letter) = \{W, X, Y, Z\}$
$first(integer) = first(digit) = \{0,1\}$
$first(char) = first(letter) \cup first(digit) = \{W, X, Y, Z\} \cup \{0,1\} = \{W, X, Y, Z, 0,1\}$
$first(ident) = first(letter) = \{W, X, Y, Z\}$
$first(opratr) = \{<, =, >, !, \hat{}\}$
$first(oprnd) = first(integer) \cup first(ident) \cup first(bool) \cup \{(\} = \{0,1, W, X, Y, Z, T, F, (\}$
$first(factor) = first(oprnd) = \{0,1, W, X, Y, Z, T, F, (\}$
$first(exprsn) = first(factor) = first(oprnd) = \{0,1, W, X, Y, Z, T, F, (\}$
$first(comprsn) = \{(\}$
$first(progcall) = \{C\}$
$first(iosym) = \{R, O\}$
$first(inout) = first(iosym) = \{R, O\}$
$first(do) = \{D\}$
$first(ifstmt) = \{I\}$
$first(assnmt) = first(ident) = first(letter) = \{W, X, Y, Z\}$
$first(statemt) = first(assnmt) \cup first(ifstmt) \cup first(do) \cup first(inout) \cup first(progcall) = \{W, X, Y, Z, I, D, R, O, C\}$
$first(program) = \{S\}$

$follow(program) = \{\$, G\}$
$follow(statemt) = follow(program) \cup \{\%\} \cup \{\&\} \cup \{U\} = \{\$, G, \%, \&, U\}$
$follow(assnmt) = follow(statemt) = \{\$, G, \%, \&, U\}$
$follow(ifstmt) = follow(statemt) = \{\$, G, \%, \&, U\}$
$follow(do) = follow(statemt) = \{\$, G, \%, \&, U\}$
$follow(inout) = follow(statemt) = \{\$, G, \%, \&, U\}$
$follow(iosym) = first(ident) = \{W, X, Y, Z\}$
$follow(progcall) = follow(statemt) = \{\$, G, \%, \&, U\}$
$follow(comprsn) = \{@\} \cup \{E\} = \{@, E\}$
$follow(exprsn) = \{;\} \cup \{)\} = \{;,)\}$
$follow(factor) = \{+\} \cup follow(exprsn) = \{+\} \cup \{;,)\} = \{+, ;,)\}$
$follow(oprnd) = \{*\} \cup follow(factor) \cup first(opratr) \cup \{)\} = \{*, +, ;,), <, =, >, !, \hat{}\}$
$follow(opratr) = first(oprnd) = \{0,1, W, X, Y, Z, T, F, (\}$
$follow(ident) = follw(oprnd) \cup \{,\} \cup \{;\} \cup \{\sim\} = \{*, +, ;,), <, =, >, !, \hat{}, ', ', \sim\}$
$follow(char) = first(char) \cup follow(ident) = \{W, X, Y, Z, 0,1, *, +, ;,), <, =, >, !, \hat{}, ', ', \sim\}$
$follow(integer) = follow(oprnd) = \{*, +, ;,), <, =, >, !, \hat{}\}$
$follow(letter) = follow(char) \cup first(char) \cup follow(ident) = \{W, X, Y, Z, 0,1, ', ', ;, \sim, *, +,), <, =, >, !, \hat{}\}$
$follow(digit) = follow(char) \cup follow(integer) \cup first(digit) = \{W, X, Y, Z, 0,1, ', ', ;, \sim, *, +,), <, =, >, !, \hat{}\}$
$follow(bool) = follow(oprnd) = \{*, +, ;,), <, =, >, !, \hat{}\}$

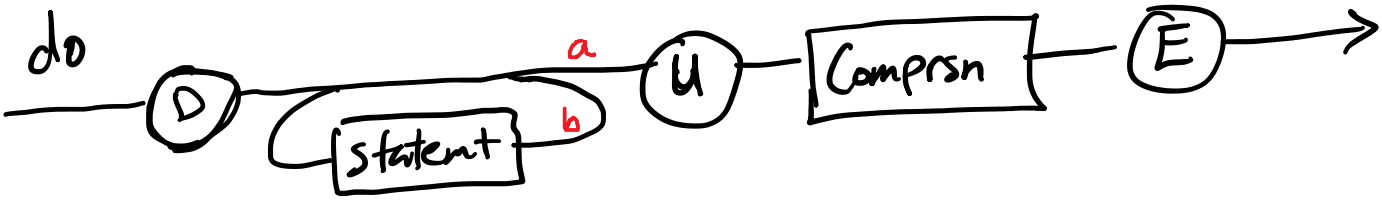


$first(a) \cap first(b)$
$[first(c) \cup first(d)] \cap first(b)$
$\{\&, \%\} \cap first(statemt)$
$\{\&, \%\} \cap \{W, X, Y, Z, I, D, R, O, C\} = \emptyset$

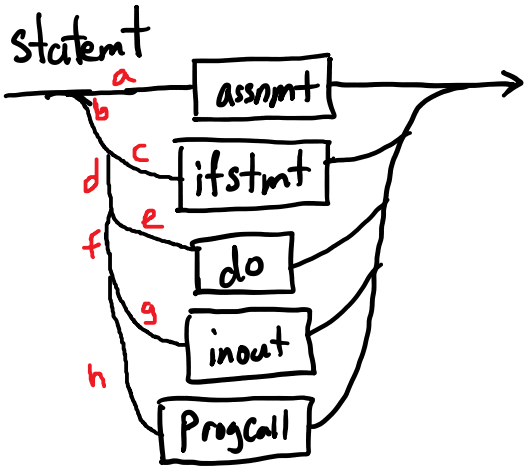
$first(e) \cap first(f)$
$\{\&\} \cap \{W, X, Y, Z, I, D, R, O, C\} = \emptyset$



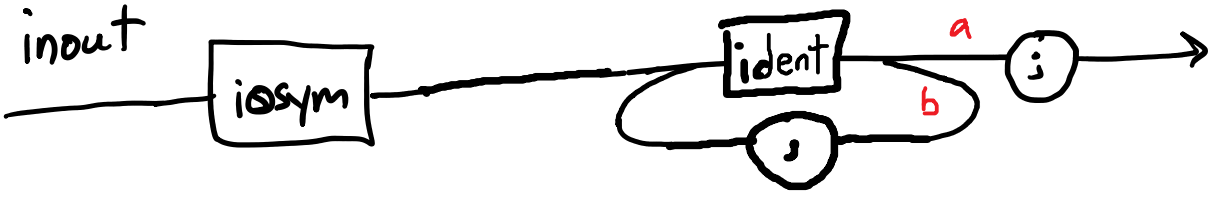
$first(b) \cap follow(a)$
$first(statemt) \cap follow(program)$
$\{W, X, Y, Z, I, D, R, O, C\} \cap \{\$, G\} = \emptyset$



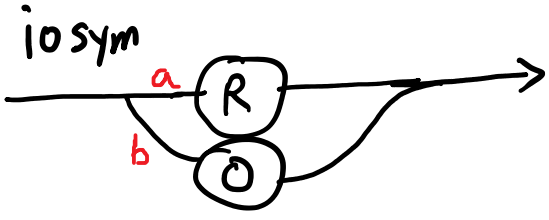
$first(a) \cap first(b)$
$\{U\} \cap first(statemt)$
$\{U\} \cap \{W, X, Y, Z, I, D, R, O, C\} = \emptyset$



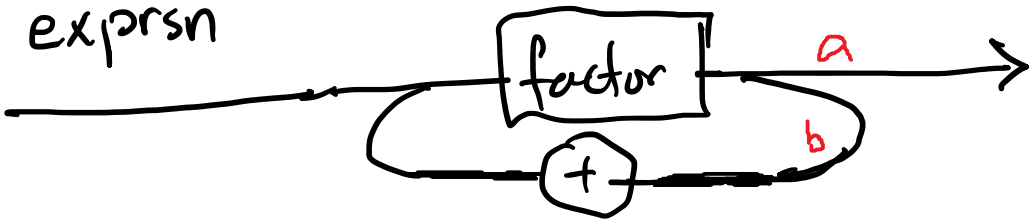
$first(a) \cap first(b)$
$first(a) \cap [first(c) \cup first(d)]$
$first(a) \cap [first(c) \cup [first(e) \cup first(f)]]$
$first(a) \cap [first(c) \cup [first(e) \cup [first(g) \cup first(h)]]]$
$first(assnmt) \cap [first(ifstmt) \cup [first(do) \cup [first(inout) \cup first(progcall)]]]$
$\{W, X, Y, Z\} \cap [\{I\} \cup [\{D\} \cup [\{R, O\} \cup \{C\}]]]$
$\{W, X, Y, Z\} \cap \{I, D, R, O, C\} = \emptyset$



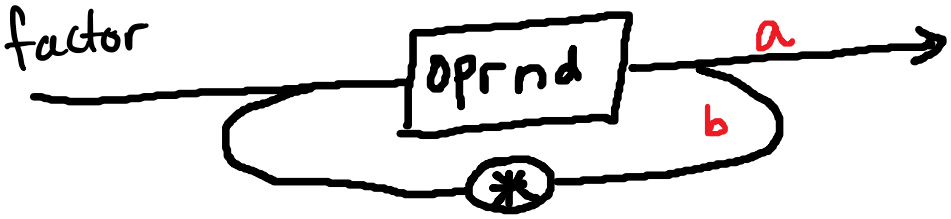
$first(a) \cap first(b)$
$\{;\} \cap \{,\} = \emptyset$



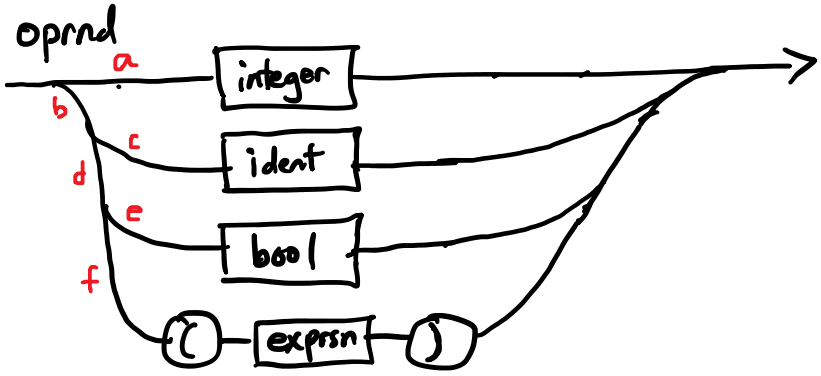
$first(a) \cap first(b)$
$\{R\} \cap \{O\} = \emptyset$



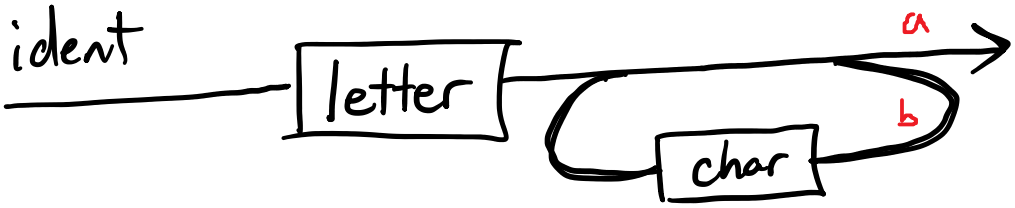
$first(b) \cap follow(a)$
$\{+\} \cap follow(exprsn)$
$\{+\} \cap \{;,)\} = \emptyset$



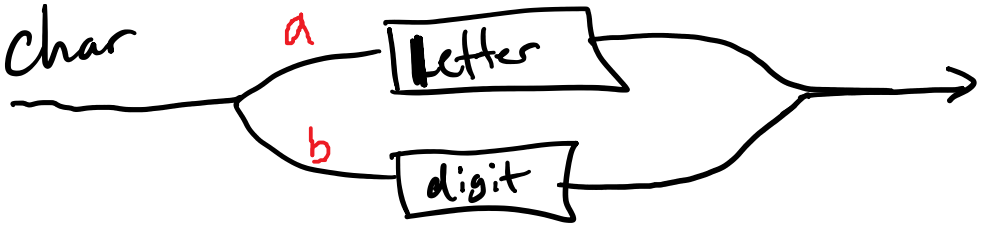
$first(b) \cap follow(a)$
$\{*\} \cap follow(factor)$
$\{*\} \cap \{+, ;,)\} = \emptyset$



$first(a) \cap first(b)$
$first(a) \cap [first(c) \cup first(d)]$
$first(a) \cap [first(c) \cup [first(e) \cup first(f)]]$
$first(integer) \cap [first(ident) \cup [first(bool) \cup \{(\}]]$
$\{0,1\} \cap [\{W, X, Y, Z\} \cup [\{T, F\} \cup \{(\}]]$
$\{0,1\} \cap \{W, X, Y, Z, T, F, (\} = \emptyset$



$first(b) \cap follow(a)$
$first(char) \cap follow(ident)$
$\{W, X, Y, Z, 0,1\} \cap \{*, +, ;,), <, =, >, !, \hat{}, ', ', \sim\} = \emptyset$



$first(a) \cap first(b)$
$first(letter) \cap first(digit)$
$\{W, X, Y, Z\} \cap \{0,1\} = \emptyset$

$first(b) \cap follow(a)$
$first(digit) \cap follow(integer)$
$\{0,1\} \cap \{*, +, ;,), <, =, >, !, \hat{}\} = \emptyset$

All of the following rules are trivial.