## INFO-F403 Introduction to Language Theory and Compilation

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Lexical units	regular expressions
INT	(UNARY + UNARY -)(0+1+2+3+4+5+6+7+8+9)*
FLOAT	(UNARY + UNARY -)(0+1+2+3+4+5+6+7+8+9)*.(0+1+2+3+4+5+6+7+8+9)*
BOOL	(0+1)
STRING (?)	$\Sigma$
VARIABLÉ	INT + FLOAT + BOOL + STRING
OPERATOR	! + * + / + - + +
OPERATOR-COMP	<+>+<=+>=++=++=++++++++++++++++++++++++
UNARY+	+
UNARY-	-
SEMICOLON	;
COMA	,
AND	&
OPEN-PAR	
CLOSE-PAR	
OPEN-BRAC	{
CLOSE-BRAC	}
DOLLAR	\$
OPEN-COND	IF
CLOSE-COND	ELSE
ADD-COND	ELSE IF
NEG-COND	UNLESS
RETURN	return
FUNCTION-ID	SUB
EXPRESSION (?)	VARIABLE OPERATOR VARIABLE
	EXPRESSION OPERATOR VARIABLE
EXPRESSION-COND (?)	VARIABLE OPERATOR-COMP VARIABLE
	EXPRESSION OPERATOR-COMP VARIABLE
CONDITION (?)	((OPEN-COND+NEG-COND)EXPRESSION-COND OPEN-BRAC INSTRUCTIONS* CLOSE-BRAC
	(ADD-COND EXPRESSION-COND OPEN-BRAC INSTRUCTIONS* CLOSE-BRAC)*
	(CLOSE-COND EXPRESSION-COND OPEN-BRAC INSTRUCTIONS* CLOSE-BRAC))
ll i	
	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND
INSTRUCTIONS	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL
	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*
FUNCTION-NAME	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?
FUNCTION-NAME PARAM-NAME	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?
FUNCTION-NAME PARAM-NAME PARAM	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions? ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*
FUNCTION-NAME PARAM-NAME	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON
FUNCTION-NAME PARAM-NAME PARAM	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION  scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION  scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT  scalar EXPRESSION + substr EXPRESSION COMA INT
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL PERL-FUNCT-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT scalar EXPRESSION + substr EXPRESSION COMA INT + print (?liste de string)
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL PERL-FUNCT-CALL FUNCTION-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT scalar EXPRESSION + substr EXPRESSION COMA INT + print (?liste de string)  USER-FUNCT-CALL + PERL-FUNCT-CALL
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL PERL-FUNCT-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION  scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT scalar EXPRESSION + substr EXPRESSION COMA INT  + print (?liste de string)  USER-FUNCT-CALL + PERL-FUNCT-CALL  FUNCTION-ID FUNCTION-NAME (OPEN-PAR CLOSE PAR + OPEN-PAR PARAM CLOSE-PAR)
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL PERL-FUNCT-CALL FUNCTION-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION  scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT scalar EXPRESSION + substr EXPRESSION COMA INT  + print (?liste de string)  USER-FUNCT-CALL + PERL-FUNCT-CALL  FUNCTION-ID FUNCTION-NAME (OPEN-PAR CLOSE PAR + OPEN-PAR PARAM CLOSE-PAR)  OPEN-BRAC INSTRUCTIONS (RETURN EXPRESSION + RETURN EXPRESSION-COND
FUNCTION-NAME PARAM-NAME PARAM USER-FUNCT-CALL PERL-FUNCT-CALL FUNCTION-CALL	+ EXPRESSION (OPEN-COND + NEG-COND) EXPRESSION-COND  ((CONDITION SEMICOLON)* + (EXPRESSION SEMICOLON)* + (FUNCTION-CALL SEMICOLON)*)*  ?restrictions?  ?restrictions?  DOLLAR PARAM-NAME (COMA DOLLAR PARAM-NAME)*  AND FUNCTION-NAME (OPEN-PAR CLOSE-PAR + OPEN-PAR PARAM CLOSE-PAR + PARAM) SEMICOLON  defined EXPRESSION + int EXPRESSION + length EXPRESSION  scalar EXPRESSION + substr EXPRESSION COMA INT COMA INT scalar EXPRESSION + substr EXPRESSION COMA INT  + print (?liste de string)  USER-FUNCT-CALL + PERL-FUNCT-CALL  FUNCTION-ID FUNCTION-NAME (OPEN-PAR CLOSE PAR + OPEN-PAR PARAM CLOSE-PAR)

 $(FUNCTION-LIST + INSTRUCTIONS)^*$ 

PROGRAM

(slide 13)