Indian Institute of Information Technology, Allahabad
Department of Information Technology

Program Code & Semester: B.Tech (IT)- 4th Semester.

Paper Title: Principles of Programming
Tutorial and Practical - Set 5

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1. YACC [Practical]
   (a) Implement a simple calculator using lex and yacc that takes as input the text of an arithmetic expression (for instance, the string "5 + 4"), and displays the value of that expression ("9").
   (b) Add more features to make it better.

2. Tutorial- Assume the following rules of associativity and precedence for expressions:

Precedence	*Highest*	*, /, **not**
		+ , − , &, **mod**
		- (unary)
		=, / =, < , <=, >=, >
		and
	Lowest	**or, xor**
Associativity	*Left to right*	

   Show the order of evaluation of the following expressions by parenthesizing all subexpressions and placing a superscript on the right parenthesis to indicate order. For example, for the expression, a + b * c + d, the order of evaluation would be represented as ((a + (b * c)) + d).
   (a) a * b - 1 + c
   (b) a * (b - 1) / c mod d
   (c) (a - b) / c & (d * e / a - 3)
   (d) -a or c = d and e
   (e) a > b xor c or d ≤ 17
   (f) -a + b

3. Tutorial- Write a BNF description of the precedence and associativity rules defined for the expressions in the above problem. Assume the only operands are the names a, b, c, d, and e.