

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

Paper Title: Principles of Programming
Tutorial and Practical - Set 2

1. YACC [Practical] - Write the code to recognize the *while* and *for* loop syntax.
 - Write the BNF for *while* loop in C.
 - Write the BNF for *for* loop in C.
 - Apply the above to the YACC rule
2. Assertion [Tutorial] - Write the pre and post condition for the following snippet and prove based on $\frac{\{I \text{ and } B\} S \{I\}}{\{I\} \text{ for } B \text{ do } S \text{ end } \{I \text{ and } (\text{not } B)\}}$ for (q = 0; q < p; q++) {
 y = y + 1;
}
3. Orthogonal [Tutorial] - Consider the following Python snippet and justify whether it is orthogonal or not.
a = 10
b = 20
c = 'a'
d = 'b'
a = a + b
c = c + d
4. Semantics [Tutorial] - Is the following need semantic attribute grammar or static context free grammar is sufficient? Justify.
sub(int a, int b, int c) {
 a = a + b + c;
 print("%d", a);
}
int main(){
 int a, b, c;
 sub(a,b,c)
}
5. Left Recursion [Tutorial] - How can indirect recursion in the Grammar can be removed? Apply the algorithm and remove it in the following grammar.
A → B + C | D
B → S + f
D → e
C → a
S → A | g