Birla Institute of Technology and Science, Pilani

Department of Computer Science and Information Systems

Semester I (2020-21)

Principles of Programming Languages (CS F301)

Tutorial sheet (#2)

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1. Design the grammar for nested if-then-else statements and discuss the ambiguity in associating the else to the then clause of if correspondingly. Also, discuss ways to overcome the difficulty using syntactic entities.

2. Discuss the nesting selectors in Java, Python, Ruby and C languages with respect to the statements block structure, use of additional keywords or symbols, static semantics etc.

3. Discuss the execution flow of the following program codes with respect to the number of times the condition is evaluated, the number of times the statement is executed and the state of the program after execution of the loop statement. Also draw the diagram to depict the flow of execution for the following loops.

    a. While (x<=y) do x=x+z;
    b. Do x= x+z while (x<=y)
    c. Repeat x=x+y until (x<=y)

4. Compare the counter controlled 'for' loop construct used in JAVA, ADA and Python. Discuss whether the loop variable is required to be assigned a new value within the loop body or the language implicitly handles the change. Discuss the design issues in counter controlled for loops.

5. Draw flow diagram of the following program fragments:

    a.
    ```
    if e1 then s1
    elseif e2 then s2
    else s2
    end
    ```

    b.
    ```
    repeat
    u=u+5*t;
    if y>=20+z
    then
    x=x+y*2;
    else
    u=u+4*x;
    until (x+u>10)
    ```

    c. if(u==19) then {if(x>y) then **{** if (u>10) then x=x+5; **}** else x=x+y+z; } else {u=10};

    d. if(u==19) then {if(x>y) then if (u>10) then x=x+5; else x=x+y+z; } else {u=10};
