**Algorithms and Pseudo-code**

An algorithm is a procedure for solving a problem in terms of the actions to be executed and the order in which those actions are to be executed. It is composed of a number of steps that must be performed to solve a problem. The steps are normally "sequence," "selection", and "iteration or loop". Algorithms can be represented in number of way such as flowcharts and pseudo-code. Pseudo-code is an artificial and informal language that helps programmers develop algorithms

**SEQUENCE**

Sequential control is indicated by writing one action after another, each action on a line by itself, and all actions aligned with the same indent. The actions are performed in the sequence (top to bottom) that they are written.

Example (non-computer)

**Brush teeth   
Wash face   
Comb hair   
Smile in mirror**

Example

**READ height of rectangle   
READ width of rectangle   
area = height times width**

**SELECTION**

The selection is when we want to make a choice based on some condition. the "if - else" statement.

Example (non-computer)

**If we have any time left after swimming**

**go to a restaurant**

**else**

**go home**

**end**

Example

**If HoursWorked > NormalMax**

**Display overtime message**

**else**

**Display regular time message**

**end**

**ITERATION**

It is used when we want the computer to keep doing something until some condition is met. The iteration is satisfied by a number of statements, such as the "while", " do", and the "for".

Example (non-computer)

**While (kettle is not full)**

**Keep adding water**

**end**

Example

**A =1**

**While (A < 5)**

**Print A**

**A = A+1**

**end**

**NESTED CONSTRUCTS**

The constructs can be embedded within each other, and this is made clear by use of indenting. Nested constructs should be clearly indented from their surrounding constructs.

Example (XOR)

**Input num1, num2**

**If (num1 is equal to 1)**

**If(num2 is equal to 1)**

**print 0**

**else**

**print 1**

**end**

**else**

**If(num2 is equal to 1)**

**print 1**

**else**

**print 0**

**end**

**end**

Example

**scholarship award = zero   
marks = 0;**

**input marks   
while (marks > 0)**

**if (marks>80)**

**scholarship award = scholarship award +1**

**end**

**input marks**

**Print scholarship award**

In the above example, the IF construct is nested within the REPEAT construct, and therefore is indented.

**More Examples:**

**1.**

**If (student's grade is greater than or equal to 60)**

**Print "passed"**

**else**

**Print "failed"**

**2.**

**total = zero**

**grade counter = one**

**average = 0**

**While (grade counter is less than or equal to ten)**

**Input grade**

**Add the grade into the total**

**average = total / ten**

**Print average.**

**3.**

**total = zero**

**counter = zero**

**Input grade**

**while (grade is not equal to sentinel (-1))**

**add this grade into the running total**

**add one to the grade counter**

**input grade (possibly the sentinel)**

**if (the counter is not equal to zero)**

**average = total/ counter**

**print average**

**else**

**print 'no grades were entered'**

**end**

**4.**

**passes = zero**

**failures = zero**

**student counter = one**

**while (student counter is less than or equal to ten)**

**input the next exam result**

**if (the student passed)**

**add one to passes**

**else**

**add one to failures**

**add one to student counter**

**end**

**print “passes are: “ passes**

**print “failures are: “ failures**

**if (passes > 8)**

**print "raise tuition"**

**end**