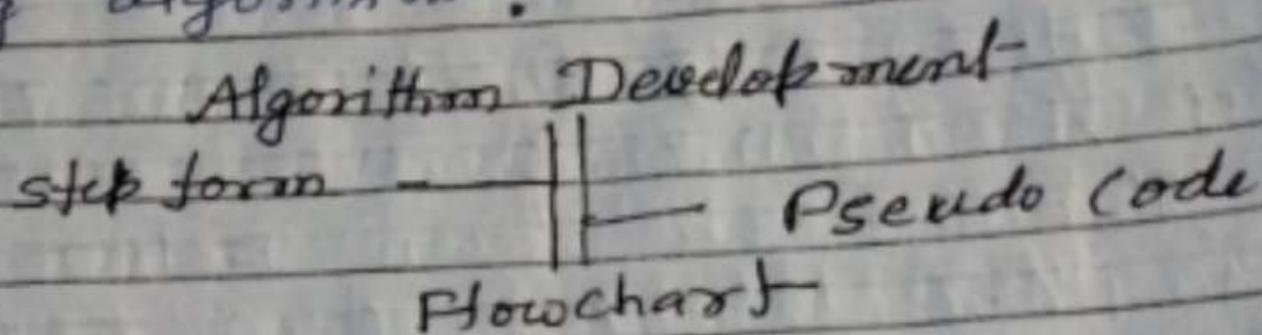


VKSU Methods of Algorithm Development

Following are the three basic ways to starting algorithm:



1.) Step form:

It is the simplest form of algorithm and it is also easy to learn. It comprises of the numbered steps or points.

Conventions for step-form:

- 1.) Two statements STARTS and STOP are logically enclosed with every algorithm.
- 2.) INPUT or READ statements are used to receive the information from the user.
- 3.) PRINT statement is used to show or display the variables value or the user's contents.
- 4.) Following are the arithmetic operations that are used in the expression:
 - = Assignment (The left hand side of '=' should always be a single variable)
 - + Addition
 - * Multiplication
 - Subtraction
 - / Division

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5) Following are the usually used relational operators in Proposition.

$>$ Greater Than

$<$ Less Than

$>=$ Greater than or equal to

$<=$ Less than or equal to

$=$ Equality

\neq Non-equality

Note:

For the equality specification as well as for the assignment the equal to ($=$) operator is used. In case of Proposition it states the equality else assignment. Left arrow (\leftarrow) may be used for the assignment to differentiate from the equality. For example, $a = b$ statement checks the equality and $a \leftarrow b$ checks the assignment.

6) Following are the most frequently used logical operators:

(i) 'AND' Conjunction

(ii) 'OR' Disjunction, and

(iii) 'NOT' Negation.

For forming Proposition this operator can be used by the user to specify more than one or multiple conditions.

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For example, The given algorithm determines the multiplication of two numbers. Suppose A and B are two numbers then its result is stored in the C.

Now the algorithm of multiplying A and B is given as follows:

Step 1 START

Step 2 PRINT "ENTER TWO NUMBERS"

Step 3 INPUT A, B

Step 4 $C = A * B$

Step 5 PRINT C

Step 6 STOP

Ex-1 Algorithm to find the sum of two numbers.

Sol: Take the two numbers A and B then the result is stored in the C. Now the algorithm to sum the two numbers is given as follows:

Step-1 START

Step 2 PRINT "ENTER TWO NUMBERS"

Step 3 INPUT A, B

Step 4 $C = A + B$

Step 5 PRINT C

Step 6 STOP

VKSU Pseudo Code



The high-level description of the Computer Programming algorithm in a compact and informal form is known as Pseudo-Code. It is not proposed for the machine reading rather it is proposed for the human reading. It also uses the Programming language's structural conventions. Descriptions Those are not necessary (i.e. Variable declaration, system specific code, and Subroutine.) for the understanding of the human are removed from the Pseudo-Code.

Pseudo Code Representation / Conventions for Pseudo Code:

- 1) It should be easy to understand and clear.
- 2) Always assign a valid name to the Pseudo-Code Procedure.
- 3) For each line of code always use the line number.
- 4) ~~if-else is used for the flow control. Always~~
- 4) In block structure use the suitable indentation for the every statement.
- 5) if-else is used for the flow control. Always check that if statement have the end-if and both should be aligned in the same vertical line.

For example. Consider the following line of Pseudo code.

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if (conditional expression)

statements

else statements

end-if

6.) To assign the statement use the '=' or "←" operators. For example Consider the following

statements:

$i = j$ or $i \leftarrow j$

$n = 2$ to length[A] or $n \leftarrow 2$ to length[A].

7.) Write the array name that is followed by the index in square brackets. For example, an array named A is written as follows: A[i]

8.) i indicates the ith element of the array A.

9.) while statement is used for the looping and iteration statement. Never forget to write the end statements for the loops such as 'end-for' for the 'for' loop.

9.) Two or more conditions can be separate with the 'and' statement.

Ex Consider the following Pseudo code example it finds the maximum elements for a given array of size n.

Algorithm: arrayMax (a[1..n], n)

step 1 max = a[1]

step 2 for i = 2 to n do

step 3 if a[i] > max, Then

step 4 max = a[i]

step 5 End if

step 6 Endfor

step 7 Return max.