Computer Skills for Medical Students
Problem Solving Part-2

Pseudocode:

Set of English like statements used to help in solving the problem.

Examples of Words used in Pseudocodes:

1. **Input:** Input, Read, get.
2. **Processing:** Compute, Calculate, =
3. **Output:** Print, Output, Display.

Example 1: Write a pseudocode to find the area of the circle.

1. Begin
2. Input r
3. Area = 3.14 * r * r
4. Print Area
5. End

Example 2: Write a pseudocode to find the average of three numbers (A, B, C)

1. Begin
2. Input A,B,C
3. Sum=A+B+C
4. Avg=Sum/3
5. Print Avg
6. End.

Write an assignment statement to:

a. Increment x by 3

X = X+3

b. Divide c by 10

C = C/10

c. Multiply z by 4

Z = Z*4

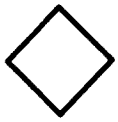
d. Decrement m by 6

m = m -6

Flowchart:

A graphical method of showing the flow of information using a series of symbols and arrows.

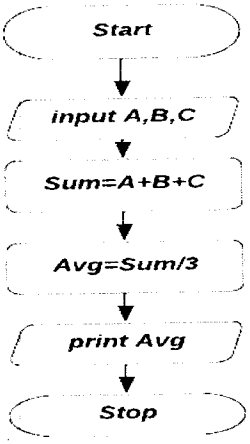
Flowcharts Symbols:

Symbol	Functionality
	Begin/End Start/Stop
	Processing (=)
	Decision (IF)
	Input / output
	Connector
	Flowlines

Flowchart Constructs:

1. Sequence.
2. Selection.
3. Looping.

1. **Sequence:** *performs one step at a time, and follow it by the next step and so forth.*



Sequence Flowchart

1. Begin
2. Input A,B,C
3. Sum=A+B+C
4. Avg=Sum/3
5. Print Avg
6. End .

Find the output for the given Pseudocode?

given 1, 2, 3

A	B	C	Sum	Avg	**Output**
1	2	3	6	2	2

2. **Selection:**

IF ..... THEN

(*Statement(s)* will be executed if the condition is true)

IF condition **THEN** *Statement(s)*

IF.... THEN .....ELSE

The **IF statement** can be of the form **IF-THEN- ELSE,** the statement(s) after **ElSE** structure will be executed if the condition is **FALSE**

IF condition **THEN** Statement(s) **ELSE** Statement(s)

Example 1:

1. Start
2. Input grade
3. IF grade >=50 THEN Print "Pass"
4. Stop

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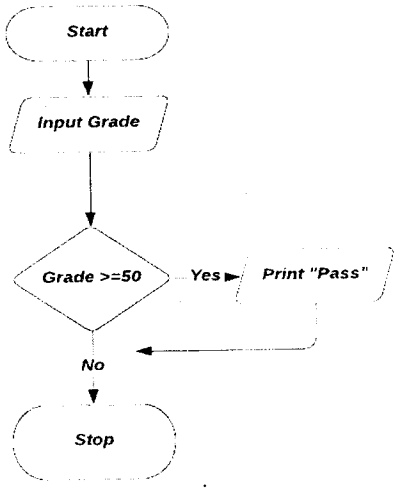
1. Find the output for the following pseudocode. (given grade = 80 or grade=40)
2. Convert to the equivalent flowchart.



Output when grade=80:

grade	output
80	Pass

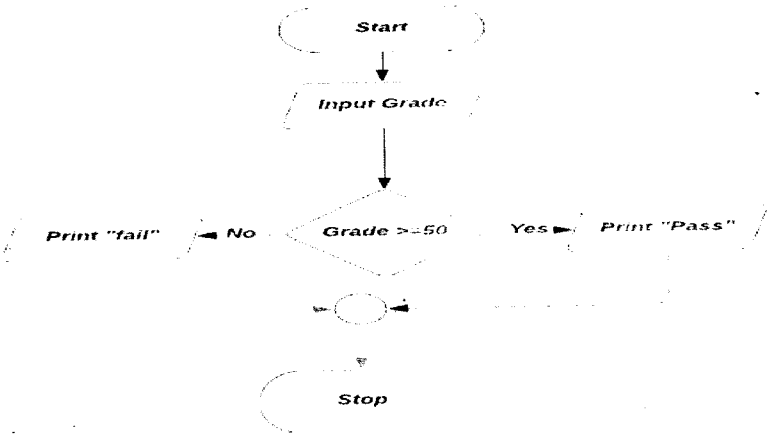
Output when grade =40:

grade	output
40	No output

Example 2

a. Find the output for the following Pseudocode
b. Convert to the equivalent flowchart.

1. Start
2. Input grade
3. IF grade >= 50 THEN Print "Pass" else Print "FAIL"
4. Stop



Output when grade= 95:

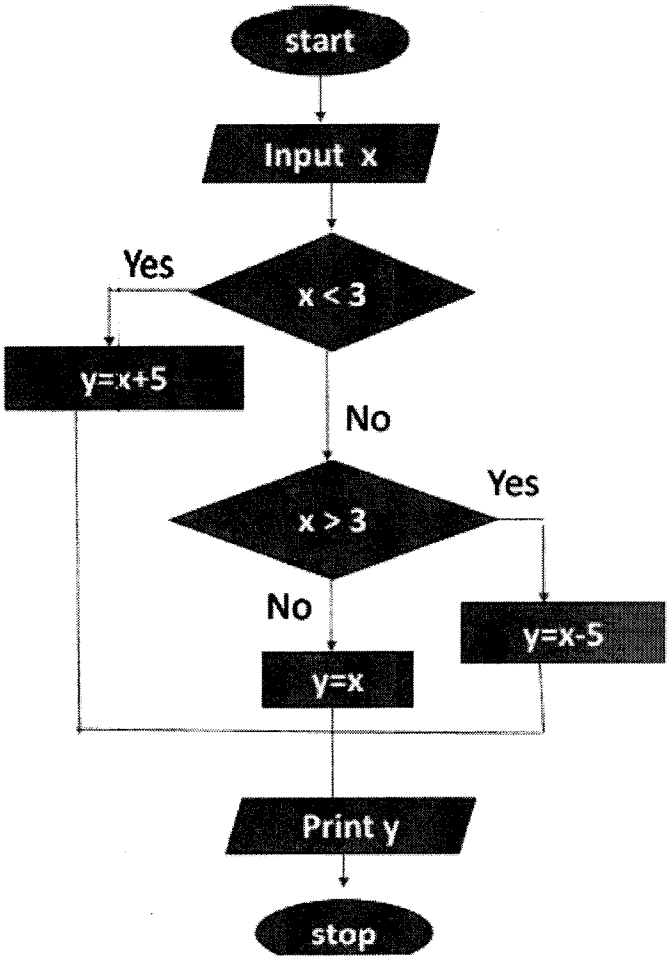
grade	output
95	Pass

Output when grade= 35:

grade	output
35	FAIL

Example 3:

Find the output for the following flowchart:



Output when x= -1

x	y	output
-1	4	4

Output when x= 3

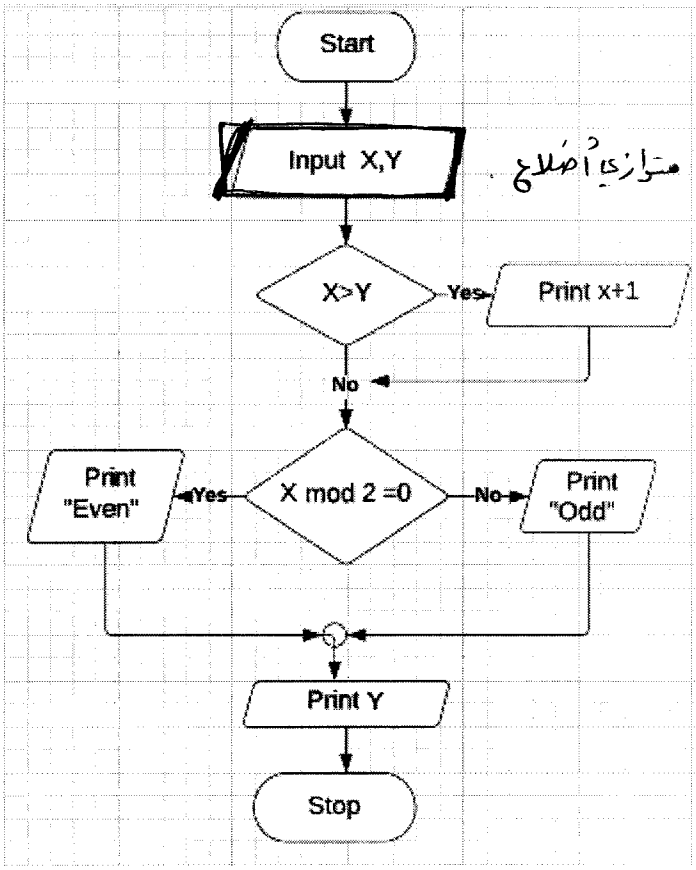
x	y	output
3	3	3

Output when x= 7

x	y	output
7	2	2

Example 4:

1. Convert the following flowcharts to the equivalent pseudocode.
2. Find the output for the following flowchart assume that the inputs are : 10,3



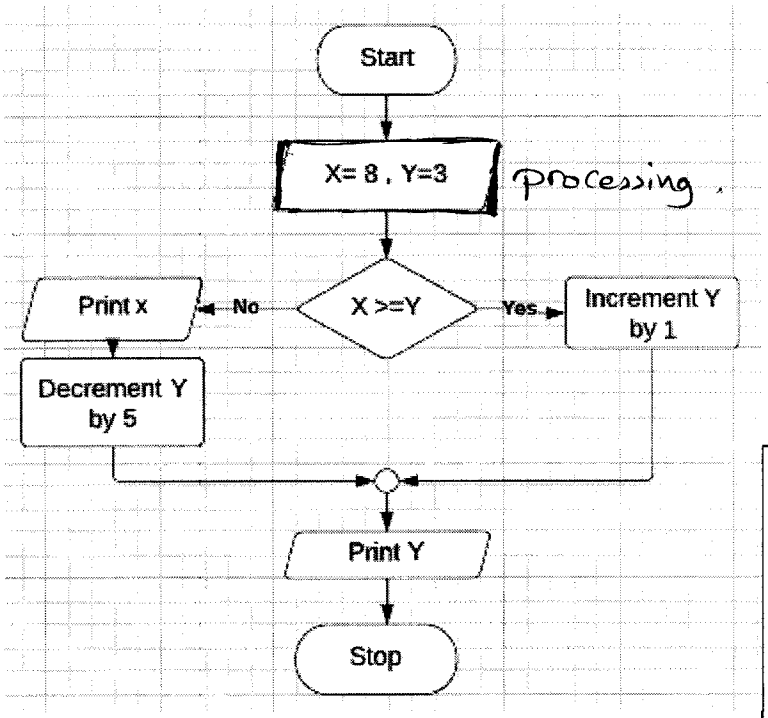
X	Y	Output
10	3	11 even 3

Pseudocode:

1. Start
2. Input x, y
3. if x > y then print x + 1
4. if x mod 2 = 0 then print "Even" else print "odd"
5. print y
6. stop.

Example 5:

1. Find the Output for the following flowchart.
2. Convert to the equivalent Pseudocode.



Output

X	Y	output
8	8 3 4	4

Pseudocode:

1. start
2. X=8 , Y=3
3. if X>=Y then Increment y by1
   else print x , Decrement y by5
4. print y
5. stop .

Looping: *performs the action as long as the condition is True.*

Example 6 : Find the output for the following pseudocode:

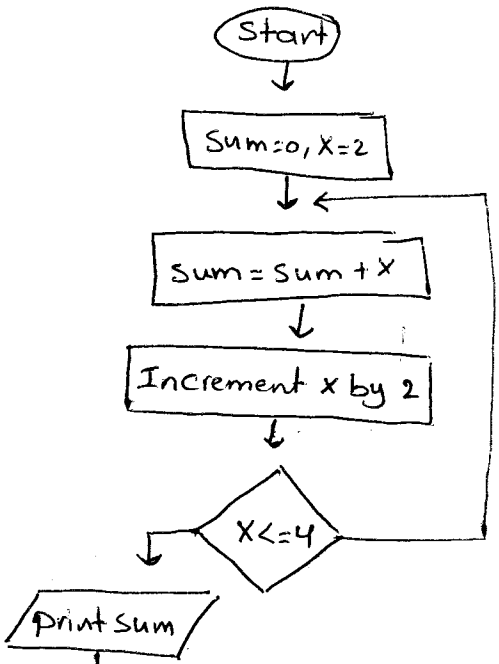
1. Begin
2. X=1
3. Print x
4. Increment x by 1
5. If x<=3 then goto 3
6. End

x	Output
1	1
2	2
3	3
4	

Example 7 : Find the output for the following pseudocode:

1. Start
2. Sum=0,x=2
3. Sum=sum + x
4. Increment x by 2
5. If x <=4 then goto 3
6. Print sum
7. Stop

x	Output
2	6
4	
6	



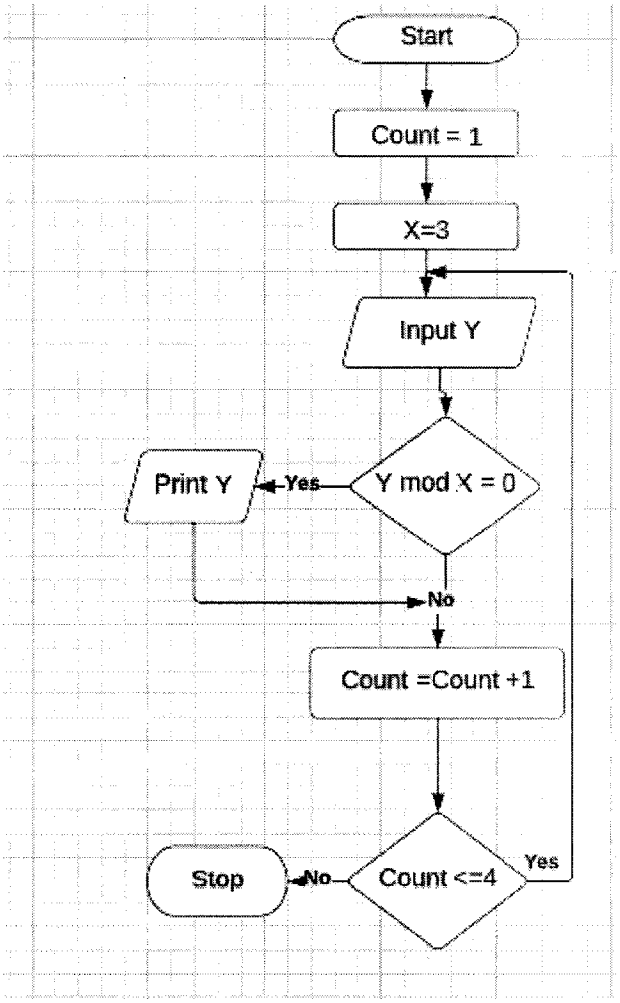
Example 8: Find the output for the following pseudocode Assume the inputs are: 3,4,6,5

1. Begin
2. C=1
3. If c< 3 then input x else goto 7
4. If x mod 2 = 0 then print x
5. c=c+1
6. goto 3
7. end

~~3~~ ~~4~~ 6 5

X	Output
~~3~~	4
4	

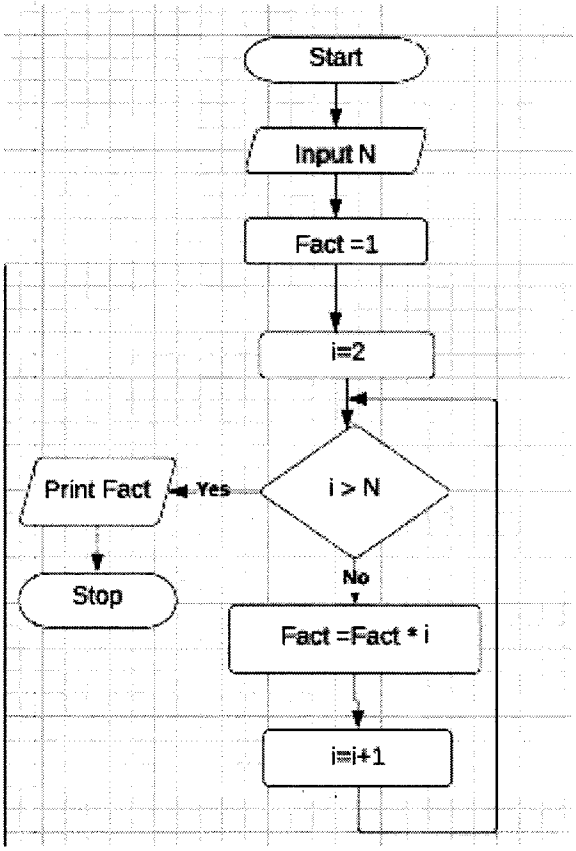
Example 9: Find the output for the following Flowchart given: 12, 5, 7, 9, 6



X	Y	Count	Output
3	~~12~~	~~1~~	12
	~~5~~	~~2~~	9
	~~7~~	~~3~~	
	9	~~4~~	
		5	

Example 10:

a. Find the output given : N=3
b. Find the output given : N=0
c. Convert to the equivalent Pseudocode.



Output

N/3 | Fact | i
1 | 2
2 | 3
6 | 4

6

Pseudocode

1. Start
2. Input N
3. Fact = 1
4. i = 2
5. If i > N then print Fact, goto 9
6. Fact = Fact * i
7. i = i + 1
8. goto 5
9. Stop