



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAMMING FOR PROBLEM SOLVING

I YEAR - I SEM

UNIT 1 – Introduction to Problem Solving Techniques

TOPIC 6 – Simple Strategies for Developing Algorithms



SIMPLE STRATEGIES FOR DEVELOPING ALGORITHM



➤ They are two commonly used strategies used in developing algorithm

1. Iteration
2. Recursion

➤ **ITERATION:**

- The iteration is when a loop **repeatedly executes** till the controlling condition becomes false.
- The iteration is applied to the set of instructions which we want to get repeatedly executed.
- Iteration includes “initialization, condition, and execution” of statement within loop and update (increments and decrements) the control variable.

➤ A sequence of statements is executed until a specified condition is true is called iterations.

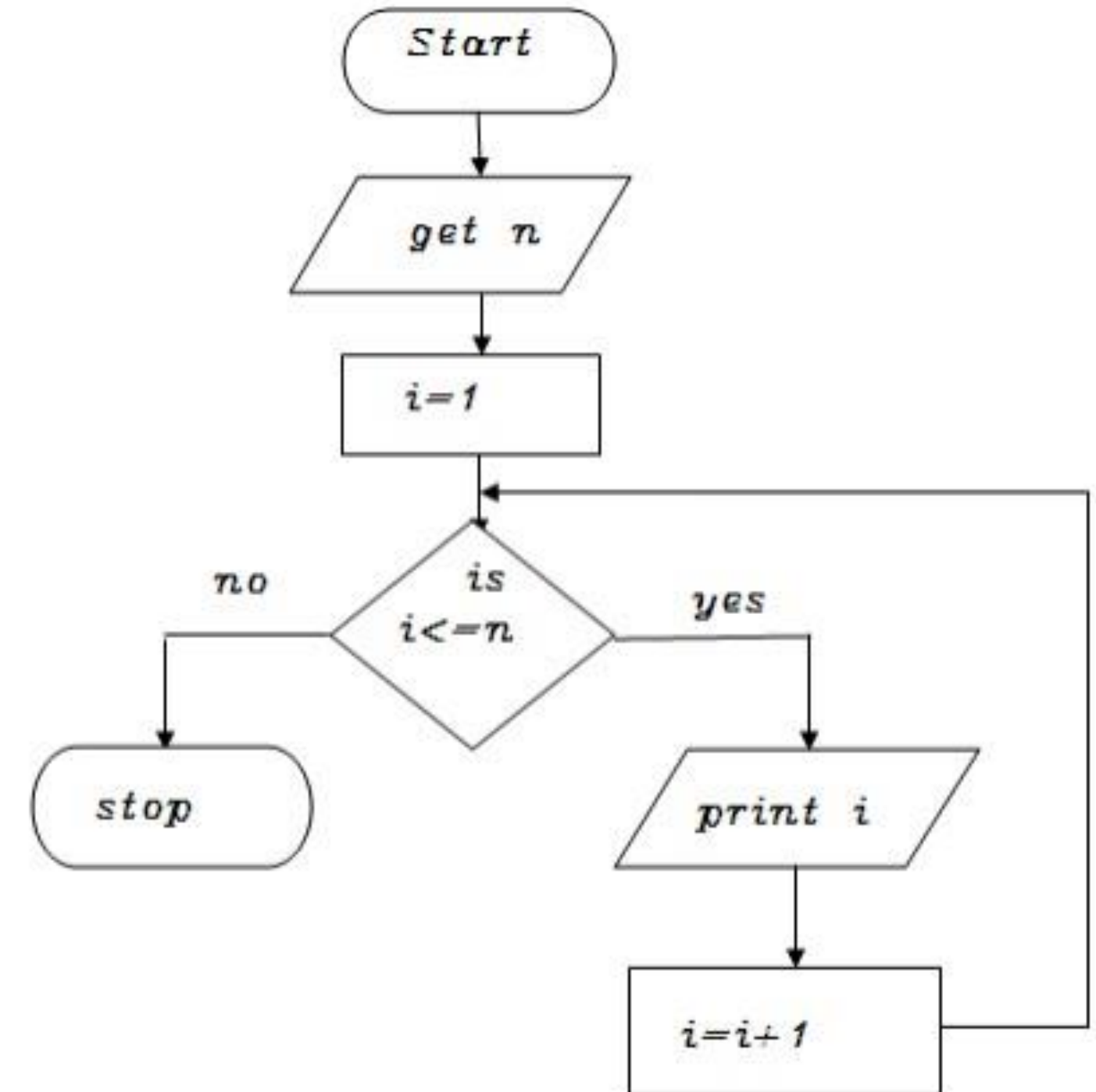
1. for loop
2. While loop



FOR & WHILE LOOP



<u>Syntax for For:</u>	<u>Example: Print n natural numbers</u>
FOR(<i>start-value to end-value</i>) DO <i>statement</i> ... ENDFOR	BEGIN GET n INITIALIZE $i=1$ FOR ($i \leq n$)DO PRINT i $i=i+$ 1 ENDFOR
	END
<u>Syntax for While:</u>	<u>Example: Print n natural numbers</u>
WHILE (condition) DO statement ... ENDWHILE	BEGIN GET n INITIALIZE $i=1$ WHILE($i \leq n$) DO PRINT i $i=i+1$
	ENDWHILE
	END





RECURSION



➤ Recursions:

- A function that calls itself is known as recursion.
- Recursion is a process by which a function calls itself repeatedly until some specified condition has been satisfied.

➤ Algorithm for factorial of n numbers using recursion

➤ Main function:

Step1: Start

Step2: Get n

Step3: call factorial(n)

Step4: print fact

Step5: Stop

➤ Sub function factorial(n):

Step1: if($n==1$) then fact=1 return fact

Step2: else fact= $n * \text{factorial}(n-1)$ and return fact



RECURSION



➤ Pseudo code for factorial using recursion:

Main function:

```
BEGIN  
GET n  
CALL  
factorial(n)  
PRINT fact  
END
```

Sub function factorial(n):

```
IF(n==1) THEN  
    fact=1  
    RETURN fact  
ELSE  
RETURN fact = n * factorial (n - 1)
```

