INTRODUCTION TO C

Session 1
08-03-2018

Week content

Week - 1 (08.03.18 - 10.03.18)

2 Session

- **Session 1 (Today):**

1. Introduction to Problem Solving through code

2. Algorithms and Flowcharts

- **Session 2 (Sunday):**

1. Basics of C

2. Decision Control - if/else, switch, break and continue

3. Intro To Functions

Days content

Introduction to Problem Solving through code

- Use cases of coding in day to day life.
- Viewing sample codes for interesting examples.
- Why coding is important for other branches of engineering.

Algorithms and Flowcharts

- How to draw Flowcharts.
- How to write algorithms.
- Examples.

What is an algorithms?

- In mathematics and computer science, an **algorithm** is an unambiguous specification of how to solve a class of problems.
- Algorithms can perform calculation, data processing and automated reasoning tasks.

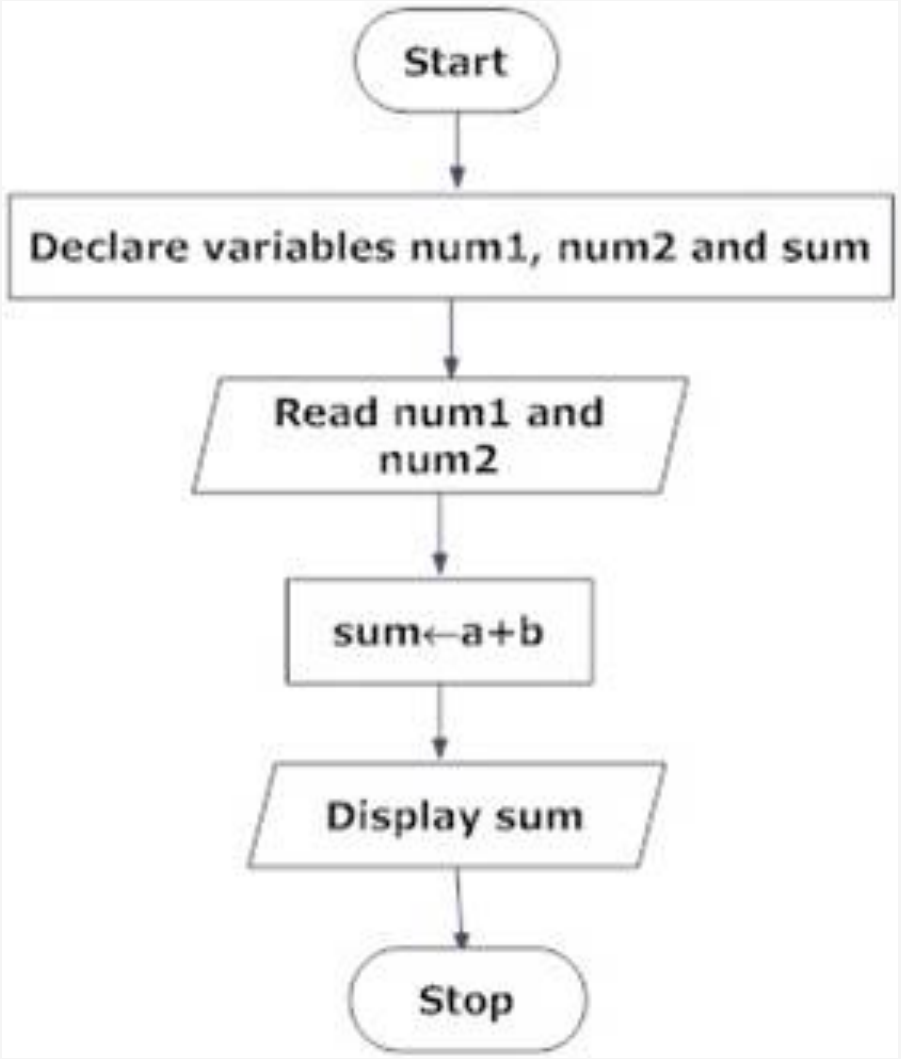
What is a flowchart?

- A **flowchart** is a type of diagram that represents an algorithm, workflow or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows.
- This diagrammatic representation illustrates a solution model to a given problem.
- Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields.

Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision

Example 1 (Flowchart)

Prob: Sum of 2 numbers



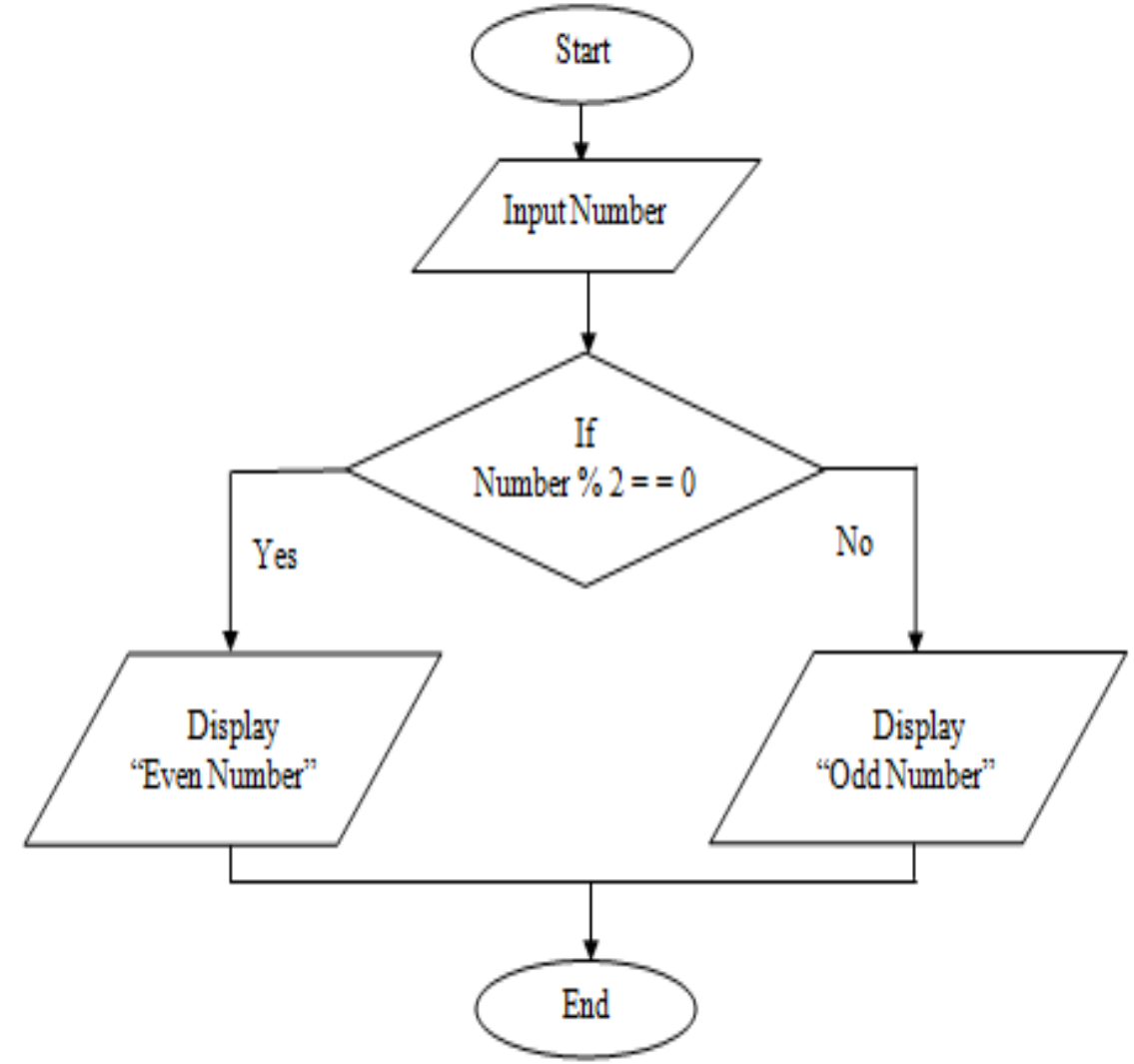
Example 1 (Algorithm)

Prob: Sum of 2 numbers

- Step 1: Start
- Step 2: Declare variables num1, num2 and sum.
- Step 3: Read values for num1, num2.
- Step 4: Add num1 and num2 and assign the result to a variable sum.
- Step 5: Display sum
- Step 6: Stop

Example 2 (Flowchart)

Prob: Number is even or odd?



Example 2 (Algorithm)

Prob: Number is even or odd?

- Step 1: Start
- Step 2: Read N
- **Step 3**:

Check: If N%2 == 0

Then

Print : N is an Even Number.

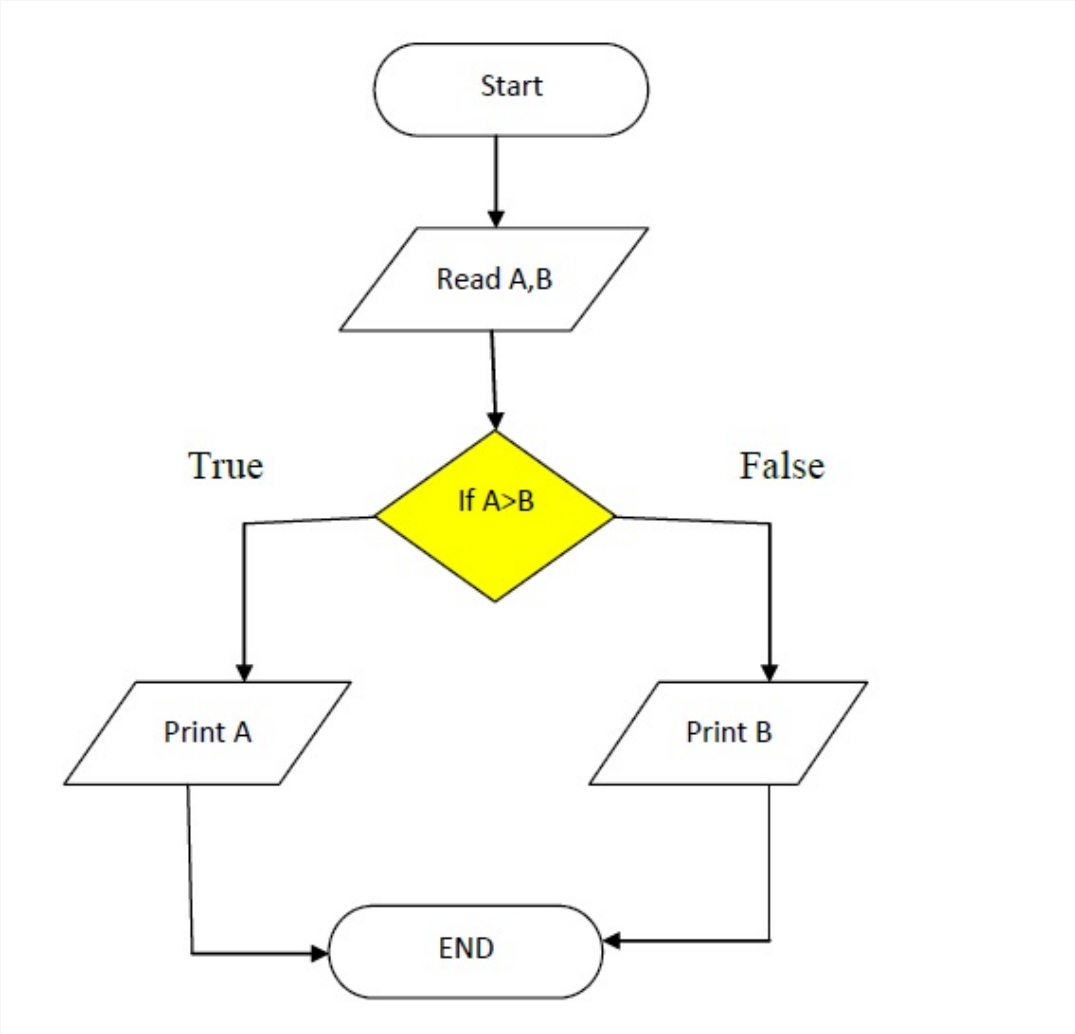
Else

Print : N is an Odd Number.

- Step 4: Stop

Example 3 (Flowchart)

Prob :Greater of Two numbers



Example 3 (Algorithm)

Prob: Greater of Two numbers

- Step 1 : Start
- Step 2 : Input a, b
- Step 3 : if a > b

then

Print a

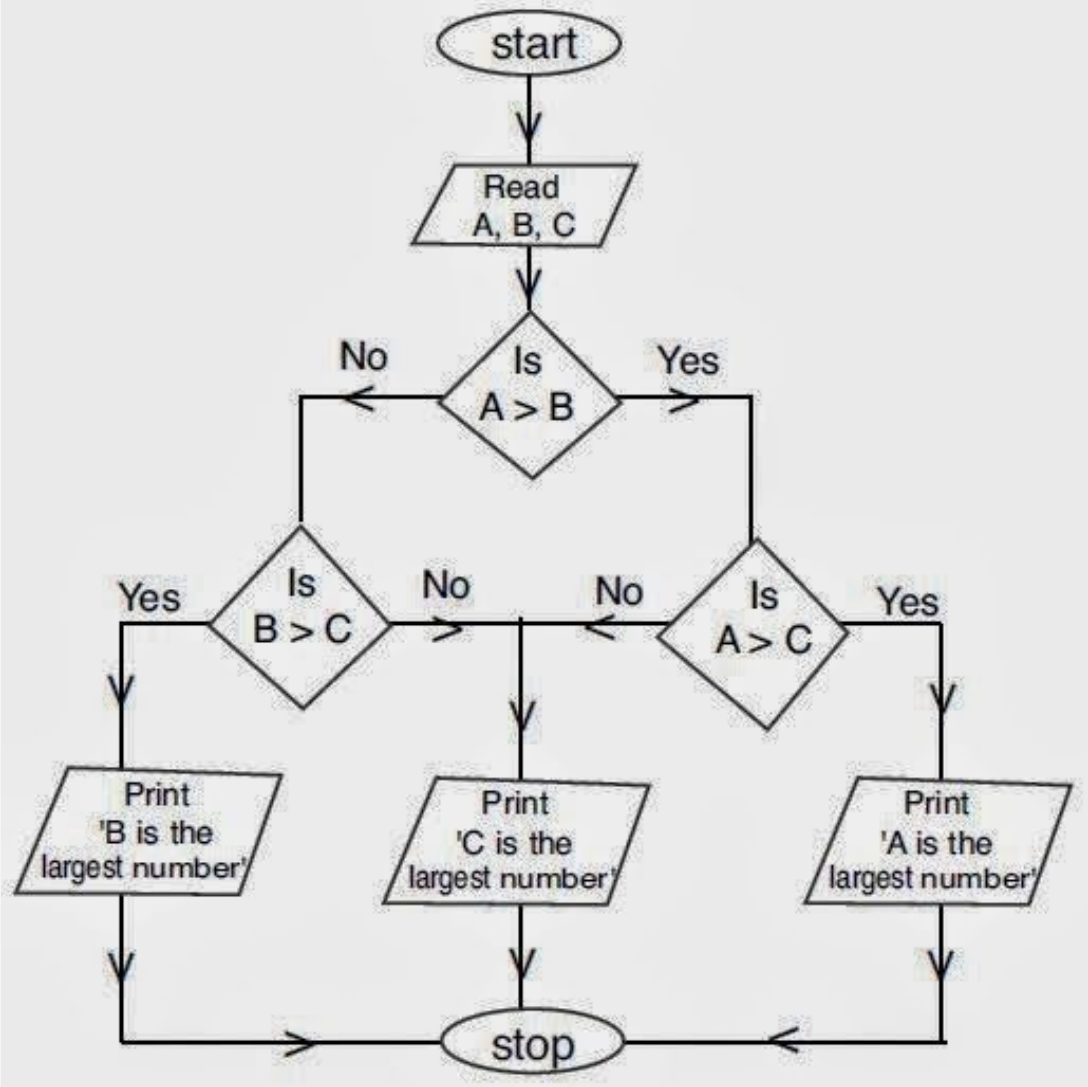
else

Print b

- Step 4 : Stop

Example 4 (Flowchart)

Prob: Greater of Three numbers



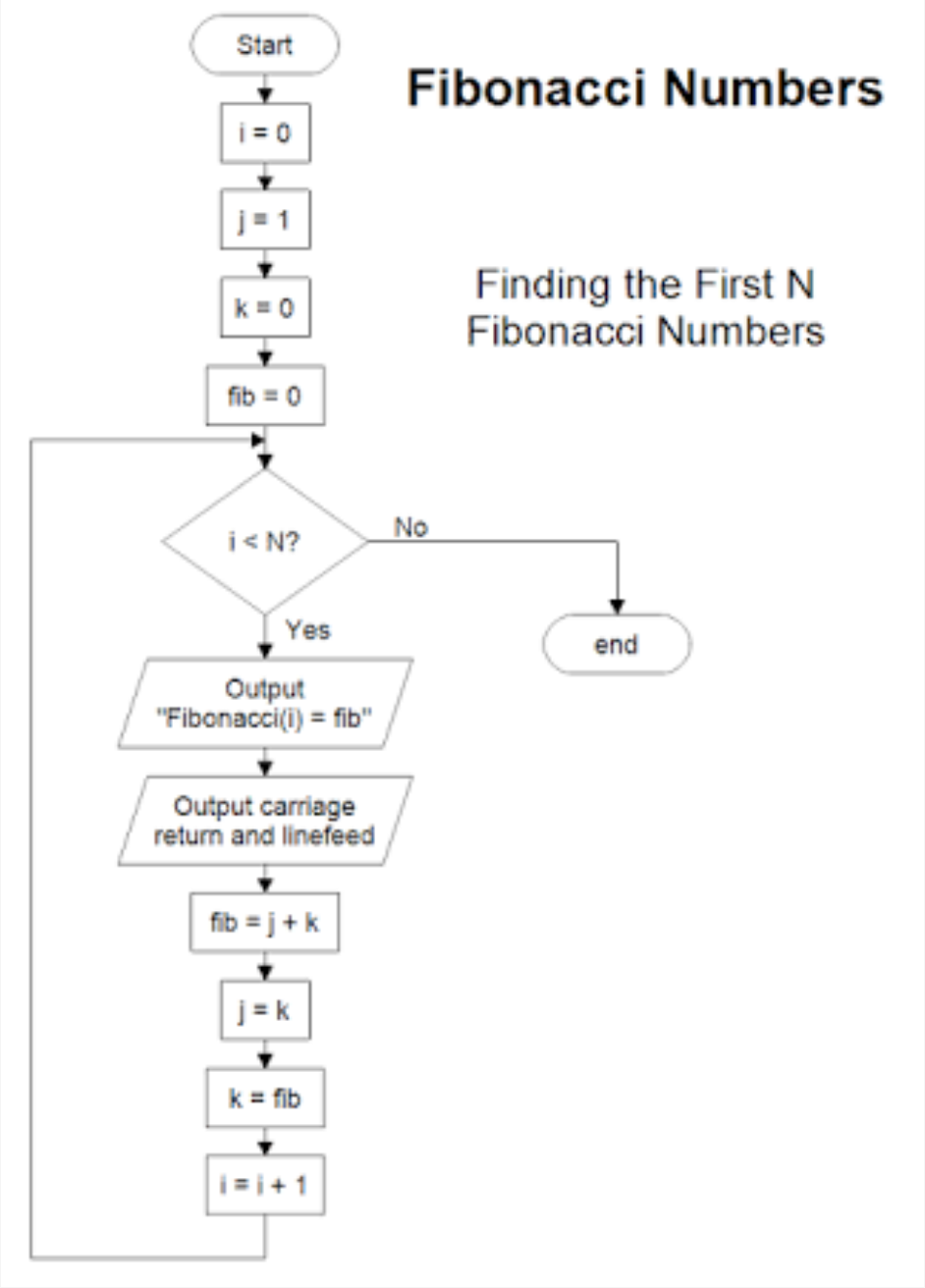
Example 4 (Algorithm)

Prob: Greater of Three numbers

- Step 1 : Start
- Step 2 : Input a, b, c
- Step 3 : if a > b goto step 4, otherwise goto step 5
- Step 4 : if a > c goto step 6, otherwise goto step 8
- Step 5 : if b > c goto step 7, otherwise goto step 8
- Step 6 : Print "a is the largest", goto step 9
- Step 7 : Print "b is the largest", goto step 9
- Step 8 : Print "c is the largest", goto step 9
- Step 9 : Stop

Example 5 (Flowchart)

Prob: Fibonacci Numbers



Example 5 (Algorithm)

Prob: Fibonacci Numbers

- Step 1: Start
- Step 2: Declare variables i, a,b , show
- Step 3: Initialize the variables, a=0, b=1, and show =0
- Step 4: Enter the number of terms of Fibonacci series to be printed
- Step 5: Print First two terms of series
- Step 6: show=a+b
- Step 7: a=b
- Step 8: b=show
- Step 9: increase value of i by 1
- Step 10: print the value of show
- Step 11: Check if i<=N

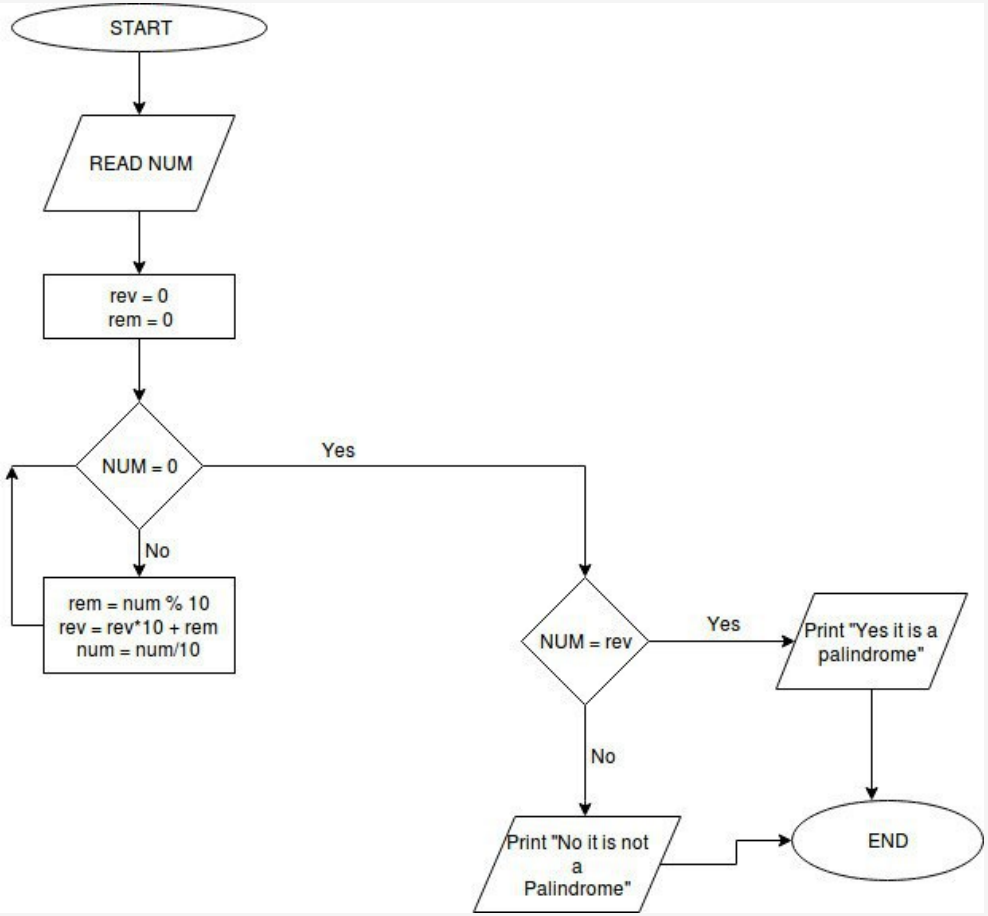
goto Step 6

Else goto Step 7

- Step 7: End

Example 6 (Flowchart)

Prob: Palindrome Numbers



Example 6 (Algorithm)

Prob: Palindrome Numbers

- Step 1: Start
- Step 2: Initialize the variables rev = 0,rem = 0
- Step 3: rem = num%10
- Step 4: rev = rev*10 + rem
- Step 5: num = num/10
- Step 6: Check if num != 0

Go to Step 3

Else

Go to Step 7

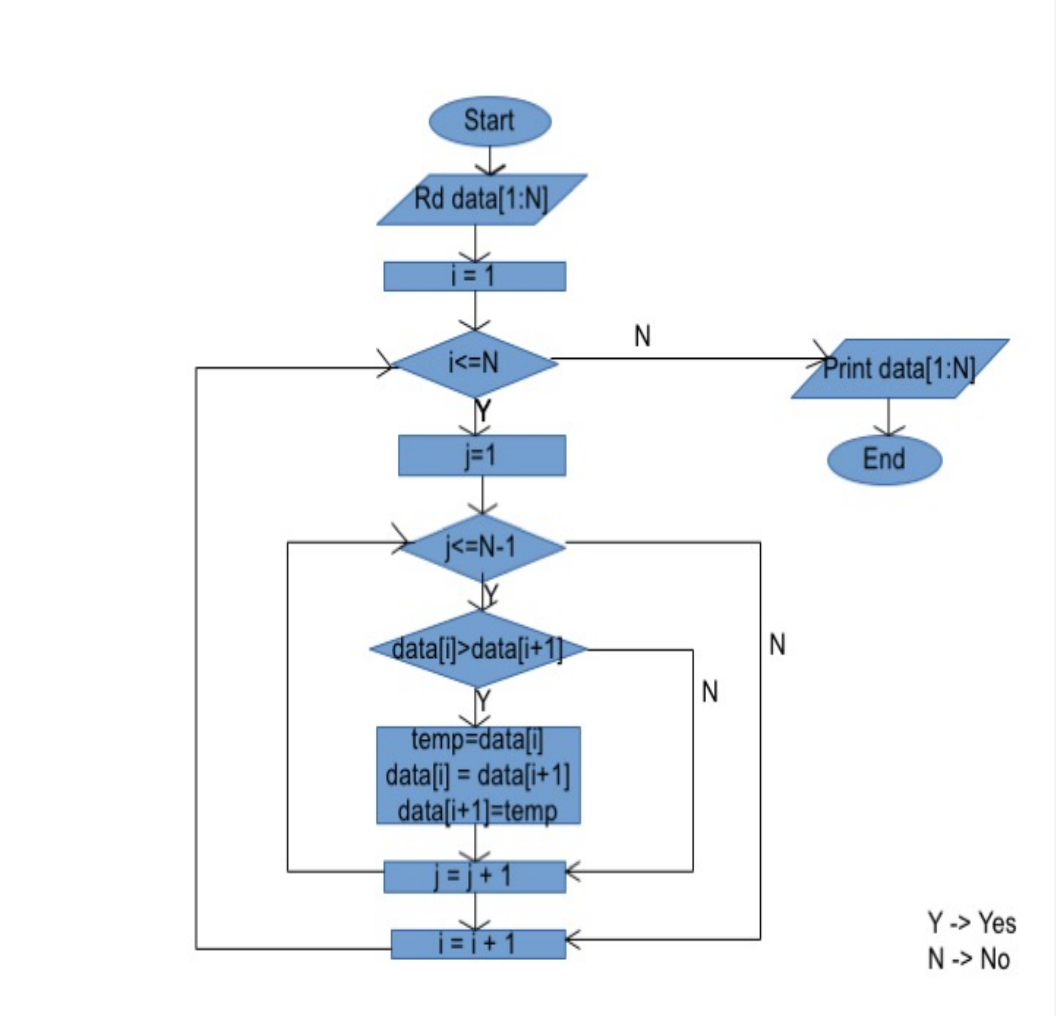
- Step 7: Check if num = rev

Print "it is a palindrome"
Else
Print "it is not a palindrome”

- Step 8: Stop

Example 7 (Flowchart)

Prob: Bubble Sort



Example 7 (Algorithm)

Prob: Bubble Sort

- Step 1: Start
- Step 2: Enter the numbers that you want to sort
- Step 3: Initialise i=0 and j=0
- Step 4: Compare the "j"th element with the "j+1"th element
- Step 5: If jth element is greater than (j+1)th element, swap the elements.
- Step 6: Increment j.
- Step 7: if j is less than n-i, then go to step 5.

  Else go to step 8.
- Step 8: Increment i
- Step 9: If i is less than n, then go to step 4.

  Else go to step 9
- Step 10: Stop

Bibliography

- Google
- Wikipedia
- Google Images