Algorithm representation using Flowcharts

The Flowchart

- (Dictionary) A schematic representation of a sequence of operations, as in a manufacturing process or computer program.
- (Technical) A graphical representation of the sequence of operations in an information system or program.
  - Information system flowcharts show how data flows from source documents through the computer to final distribution to users.
  - Program flowcharts show the sequence of instructions in a single program or subroutine. Different symbols are used to draw each type of flowchart.

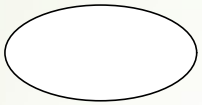
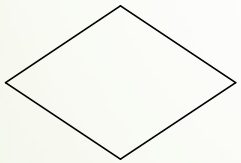
The Flowchart

A Flowchart

- shows logic of an algorithm
- emphasizes individual steps and their interconnections
- e.g. control flow from one action to the next

Flowchart Symbols

Basic

Name	Symbol	Use in Flowchart
Oval		Denotes the beginning or end of the program
Parallelogram		Denotes an input operation
Rectangle		Denotes a process to be carried out e.g. addition, subtraction, division etc.
Diamond		Denotes a decision (or branch) to be made. The program should continue along one of two routes. (e.g. IF/THEN/ELSE)
Hybrid		Denotes an output operation
Flow line		Denotes the direction of logic flow in the program

Example

- Write an algorithm and draw a flowchart to convert the length in feet to centimeter.

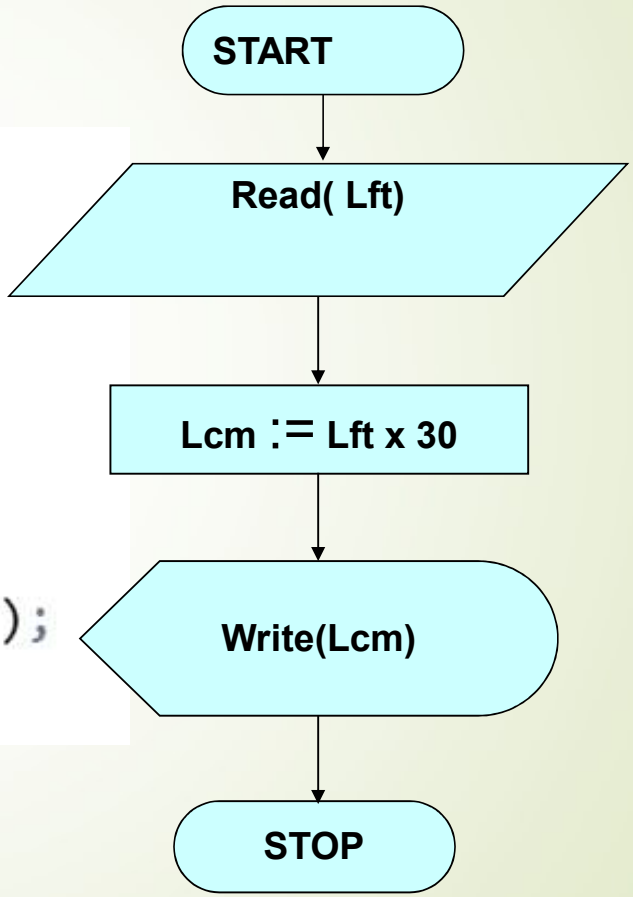
Pseudocode:

- *Input the length in feet (Lft)*
- *Calculate the length in cm (Lcm) by multiplying LFT with 30*
- *Print length in cm (LCM)*

Example 1

```
Algorithm Transform_unitStep
Var
   Lft,Lcm : real;
Begin
write('give the length in feet :')
  read(Lft);
  Lcm:= Lft*30;
  Write('the length =', Lcm, 'centimeter');
end.
```

Flowchart



Example 2

Write an algorithm and draw a flowchart that will read the two sides of a rectangle and calculate its area.

Pseudocode

- *Input the width (W) and Length (L) of a rectangle*
- *Calculate the area (A) by multiplying L with W*
- *Print A*

Example 2

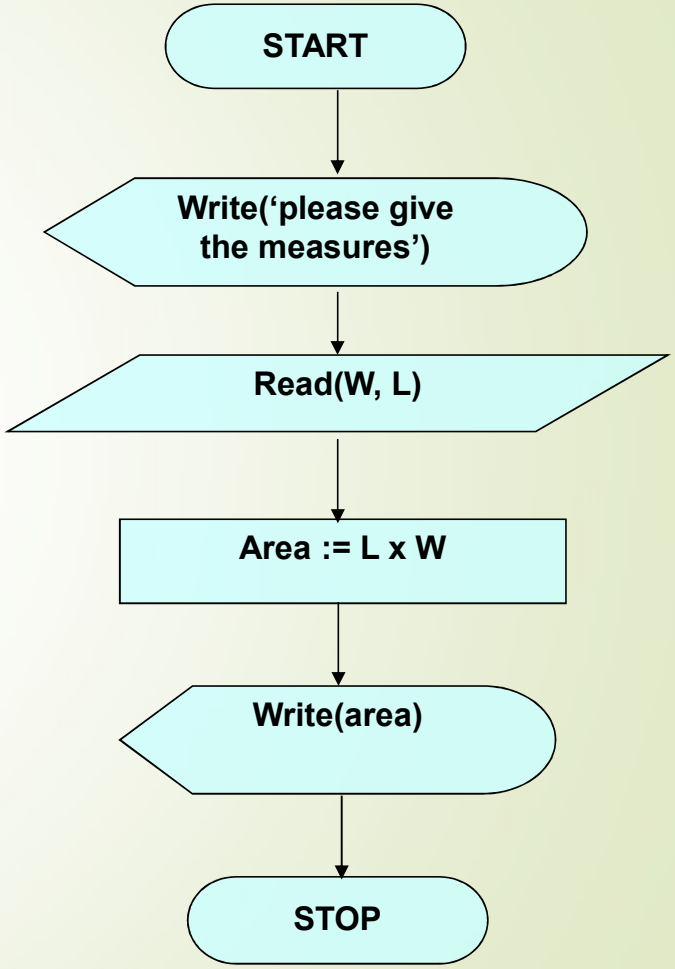
```
Algorithm  Area_Rectangl;
var
  l,w, area : real;

begin

  writeln ('Please enter the width anfd the length');
  readln(l,w);
  area:= l*w;

  writeln ('The calculated surface =', area);

end.
```

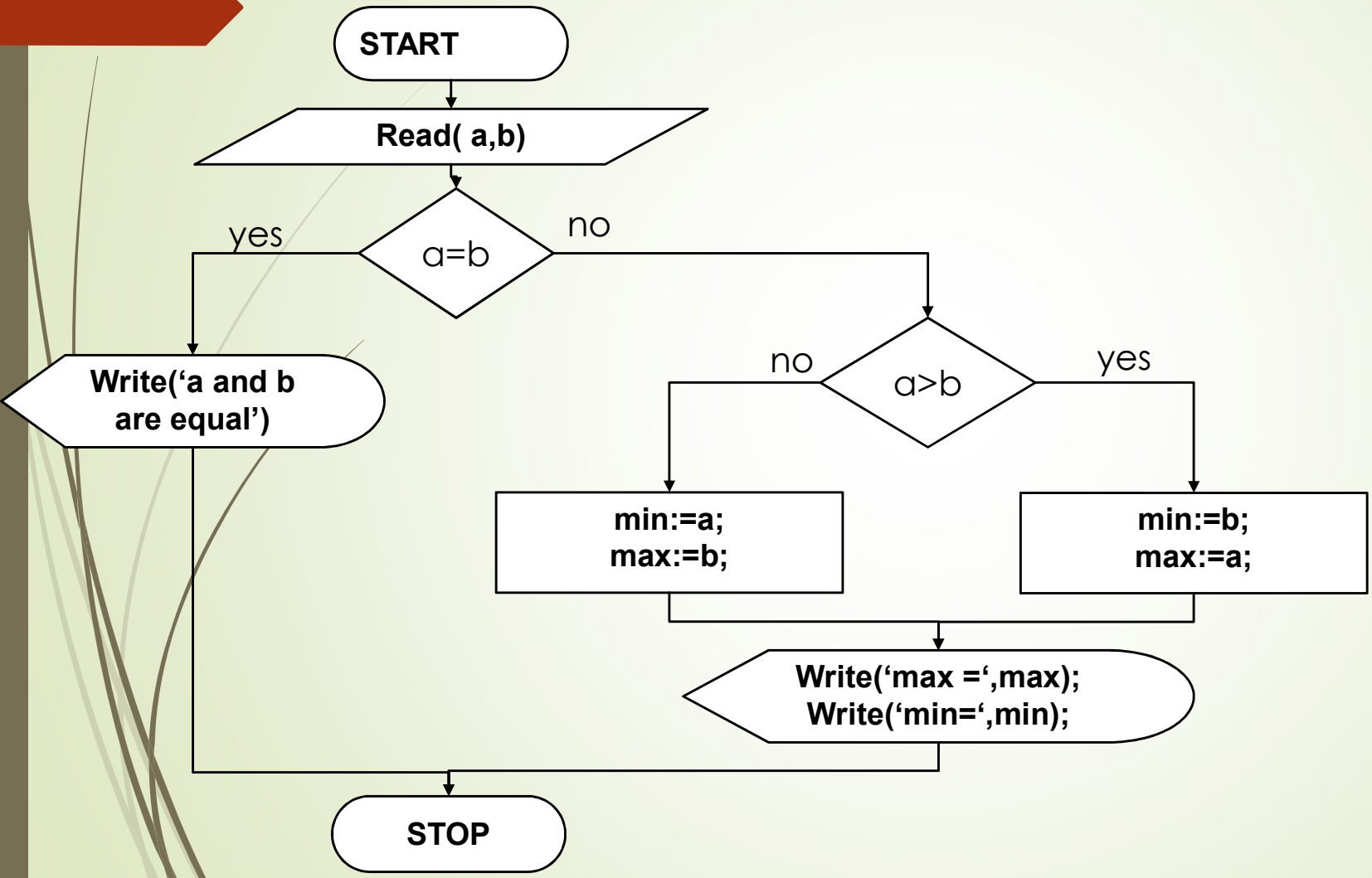


Exemple 3 the min_max Algorithm

```
Algorithm  max_min;
var
  a,b,max,min: integer;
begin
  writeln ('Enter the two numbers a,b :');
  read(a,b);
  if a=b then writeln('the two numbers are equal')
         else if a>b then min:=b;
                          max:=a;
                     else min=a;
                          max:=b;
              endif
              write('the maximum =',max);
              write('the minimum =',min);
  endif

end.
```

Exemple 3


START
Read(a,b)
a=b
yes
no
Write(‘a and b are equal’)
a>b
no
yes
min:=a;
max:=b;
min:=b;
max:=a;
Write(‘max =‘,max);
Write(‘min=‘,min);
STOP