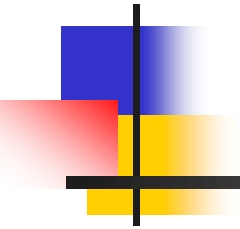
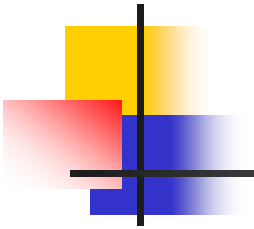


Basics of C

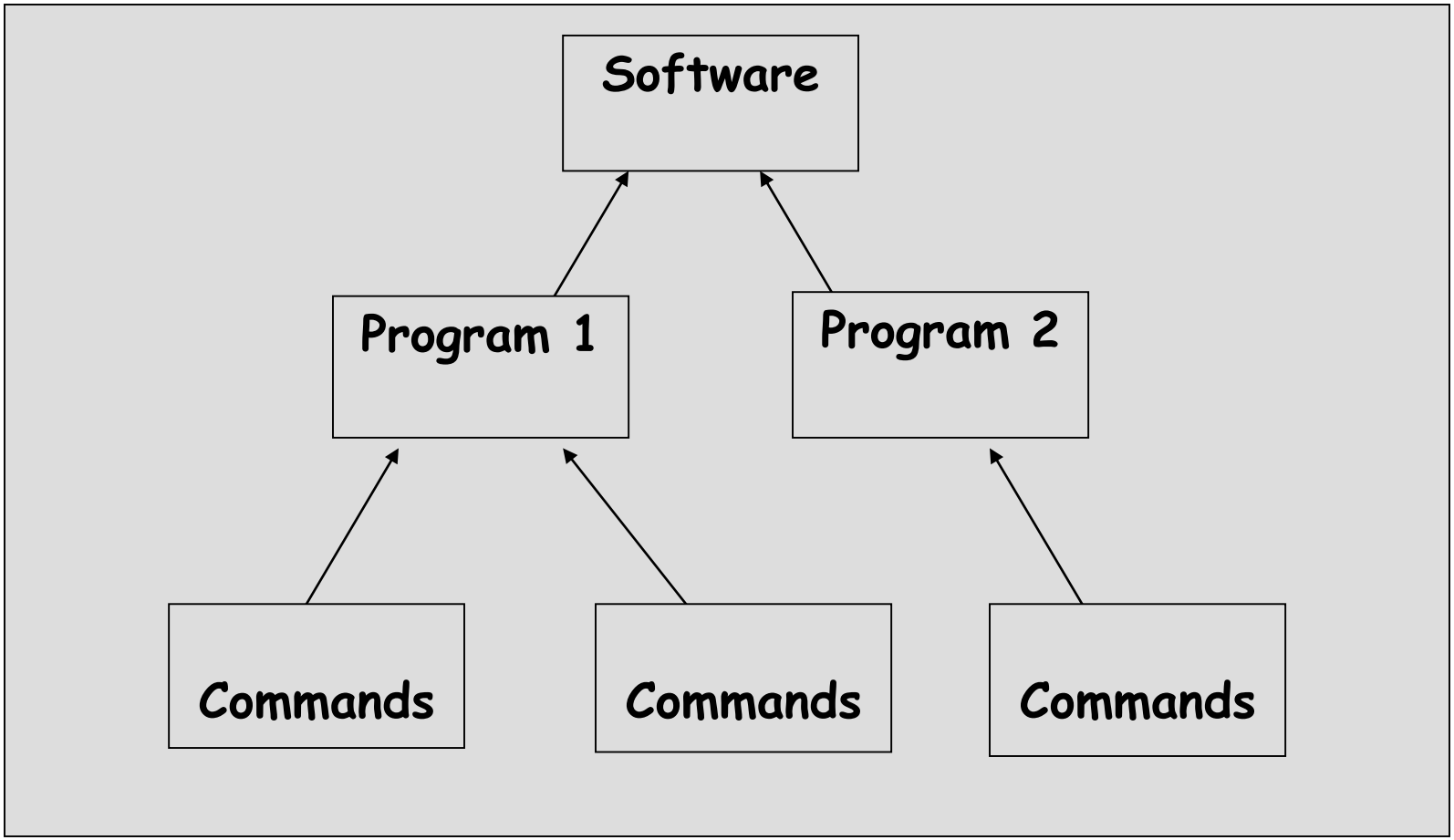
Session 1



Objectives

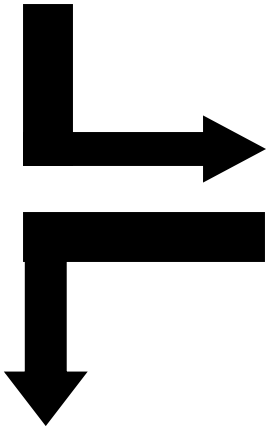
- Differentiate between Command, Program and Software
- Explain the beginning of C
- Explain when and why is C used
- Discuss the C program structure
- Discuss algorithms
- Draw flowcharts
- List the symbols used in flowcharts

Software, Program and Command



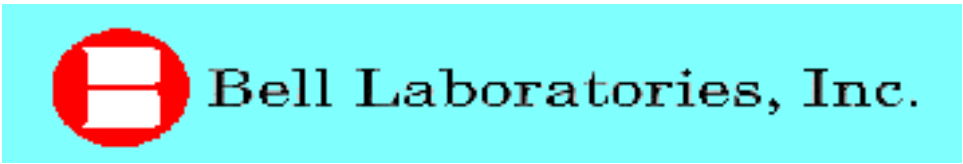
The Beginning of C

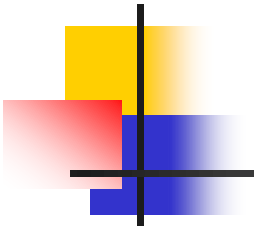
BPCL – Martin Richards



B – Ken Thompson

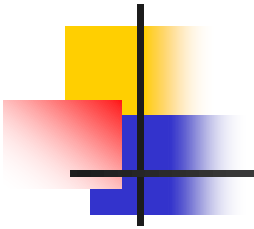
C – Dennis Ritchie





Application Areas Of C

- C was initially used for systems programming
- A system program forms a portion of the operating system of the computer or its support utilities
- Operating Systems, Interpreters, Editors, Assembly programs are usually called system programs
- The UNIX operating system was developed using C
- There are C compilers available for almost all types of PC’s



Middle Level Language

High Level Language

C

Assembly Language

Structured Language

- C allows synthesis of code and data

- It refers to the ability to section off and hide all information and instructions which necessary to perform a specific task, from the rest of the program

```
do
{
      i = i + 1;
      .
      .
      .
} while (i < 40);
```

- Code can be compartmentalized in C by using functions or code blocks.

About C

- **C has 32 keywords**
- These keywords combined with a formal syntax form a C programming language
- Rules to be followed for all programs written in C:
  - All keywords are lowercased
  - **C** is case sensitive, **do while** is different from **DO WHILE**
  - Keywords cannot be used as a variable or function name

```
main()
{
/*This is a sample Program*/
      int i,j;
      i=100;
      j=200;
}
```

The C Program Structure-1

main()

- C programs are divided into units called functions.
- Irrespective of the number of functions in a program, the operating system always passes control to main() when a C program is executed.
- The function name is always followed by parentheses.
- The parentheses may or may not contain parameters.

The C Program Structure-2

Delimiters { ... }

The function definition is followed by an open curly brace ({).

This curly brace signals the beginning of the function.

Similarly a closing curly brace (}) after the codes, in the function, indicate the end of the function.

The C Program Structure-3

Statement Terminator .... ;

A statement in C is terminated with a semicolon

A carriage return, whitespace, or a tab is not understood by the C compiler.

A statement that does not end in a semicolon is treated as an erroneous line of code in C.

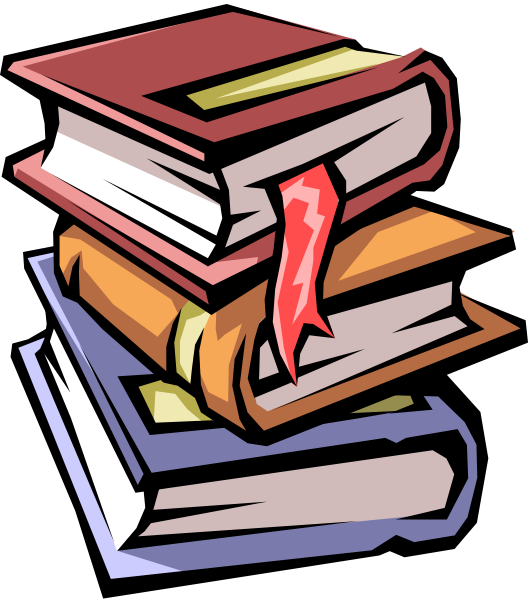
The C Program Structure-4

/* Comment Lines */

Comments are usually written to describe the task of a particular command, function or an entire program.

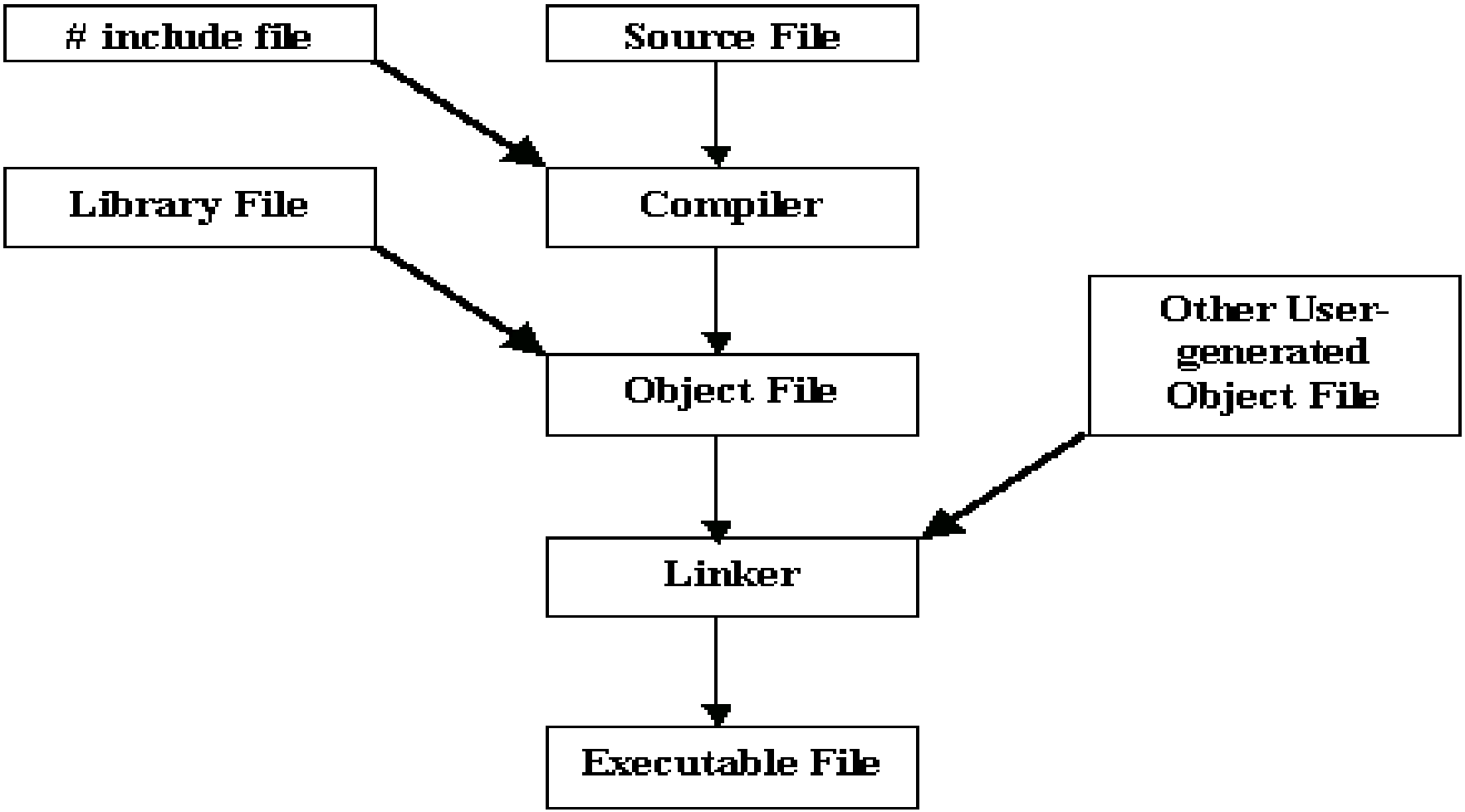
The compiler ignores them. In C, comments begin with /* and are terminated with */, in case the comments contain multiple lines

The C Library

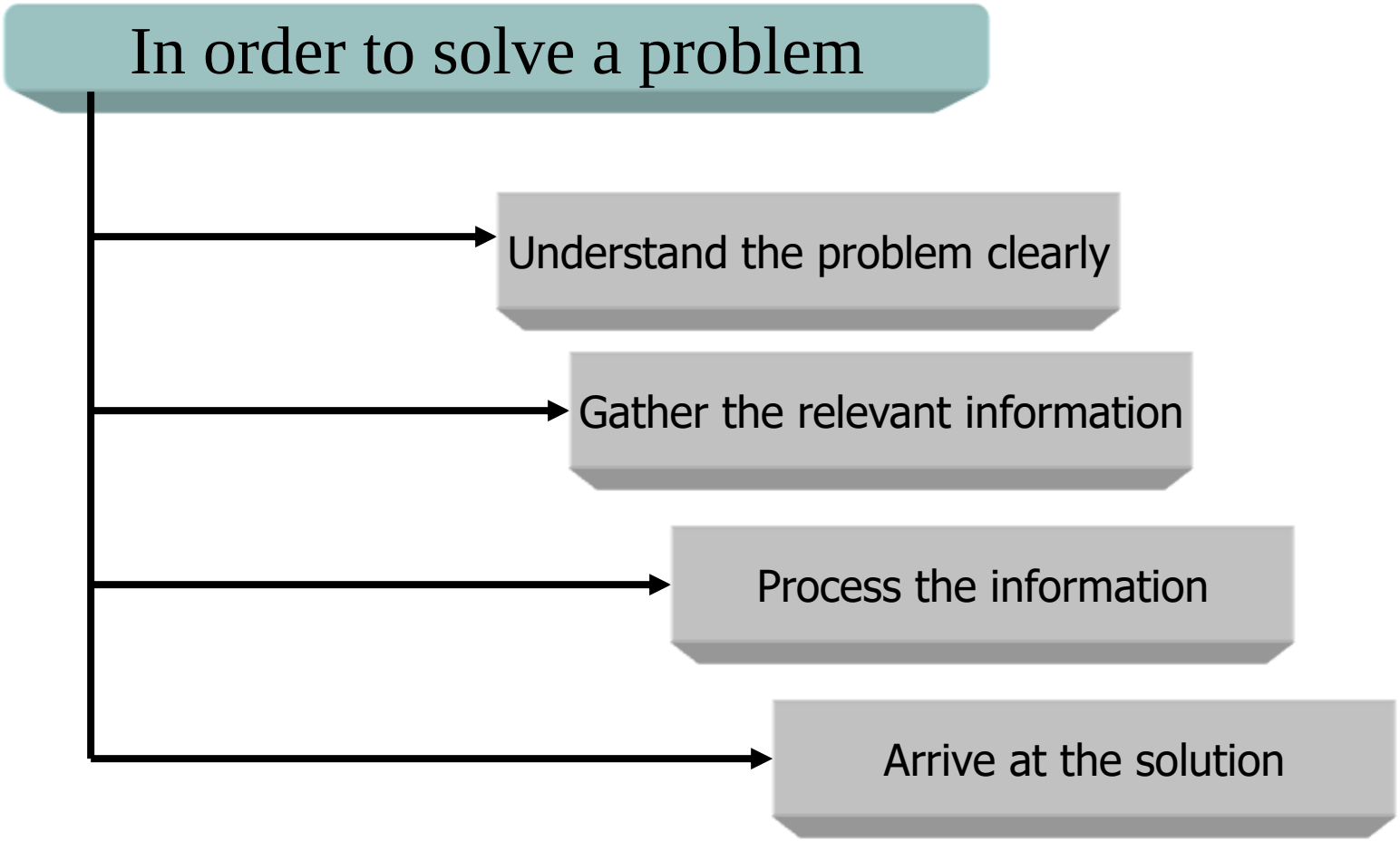


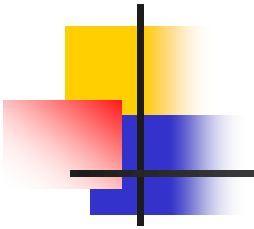
- All C compilers come with a standard library of functions
- A function written by a programmer can be placed in the library and used when required
- Some compilers allow functions to be added in the standard library
- Some compilers require a separate library to be created

Compiling & Running A Program



Solving a Problem





Pseudocode

It is not actual code. A method of algorithm - writing which uses a standard set of words which makes it resemble code

```
BEGIN
    DISPLAY 'Hello World !'
END
```

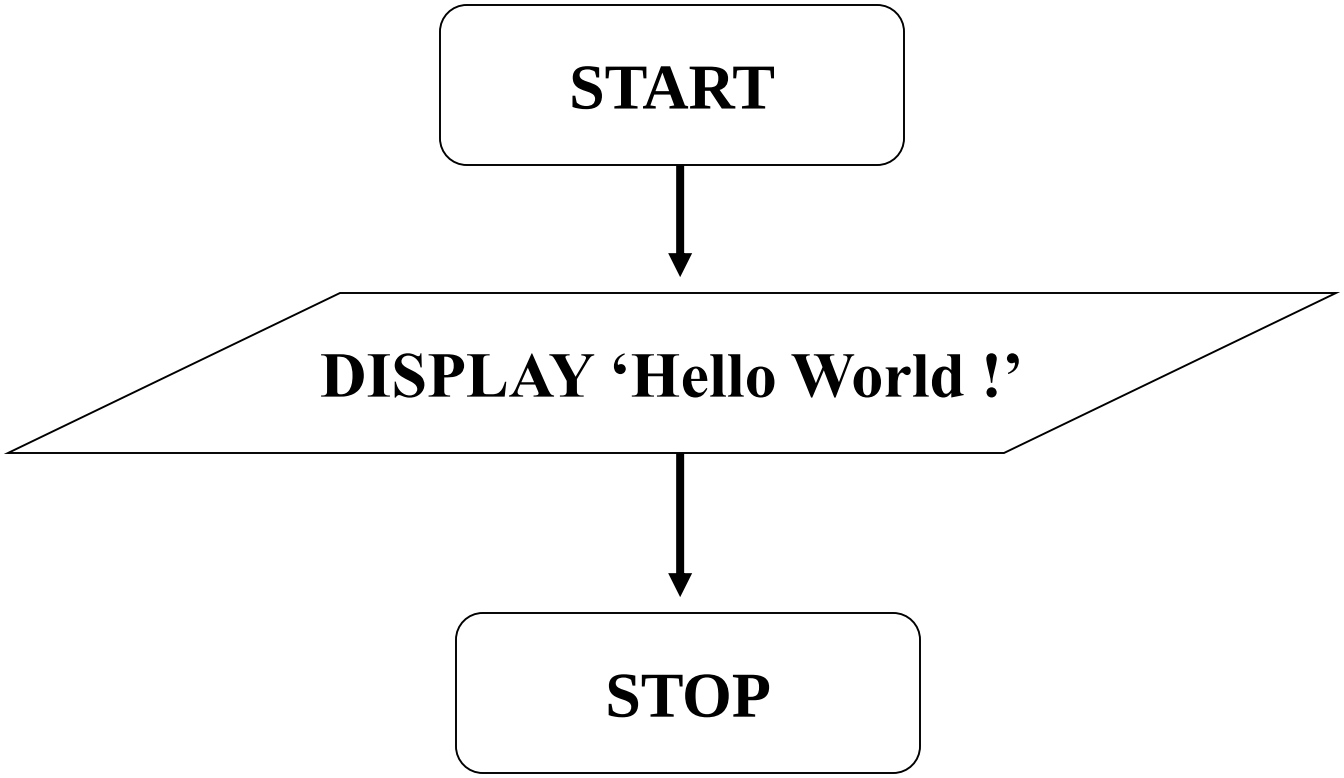
Each pseudocode starts with a BEGIN

To show some value , the word DISPLAY is used

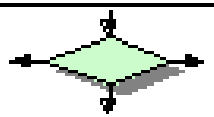
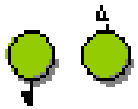
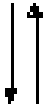
The pseudocode finishes with an END

Flowcharts

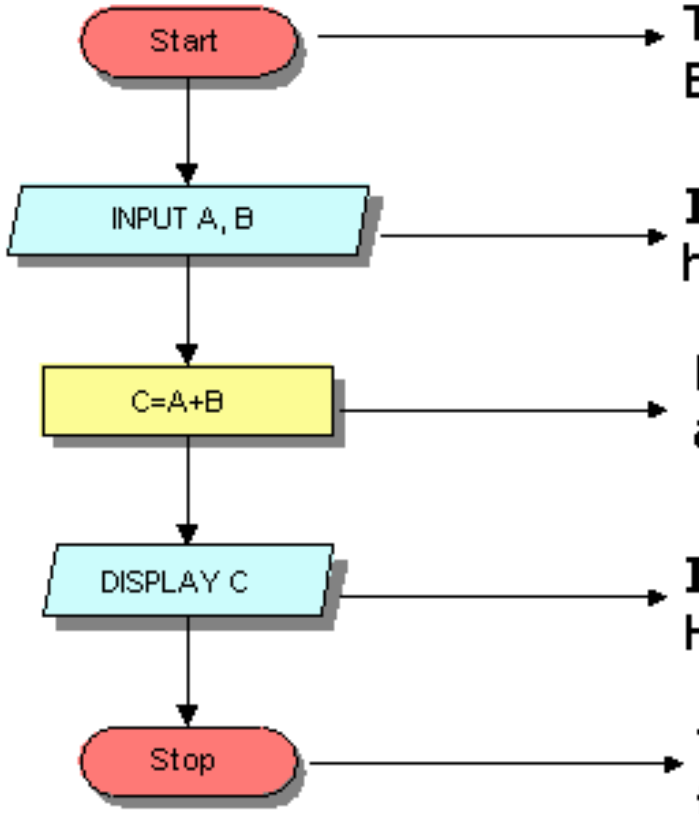
It is a graphical representation of an algorithm



The Flowchart Symbol

Symbol	Description
	Start or End of the Program
	Computational Steps
	Input / Output instructions
	Decision making & Branching
	Connectors
	Flow Line

Flowchart to add two numbers



Terminal Symbol: Used here to Begin the flowchart

Input/Output Symbol: Used here to Input two numbers

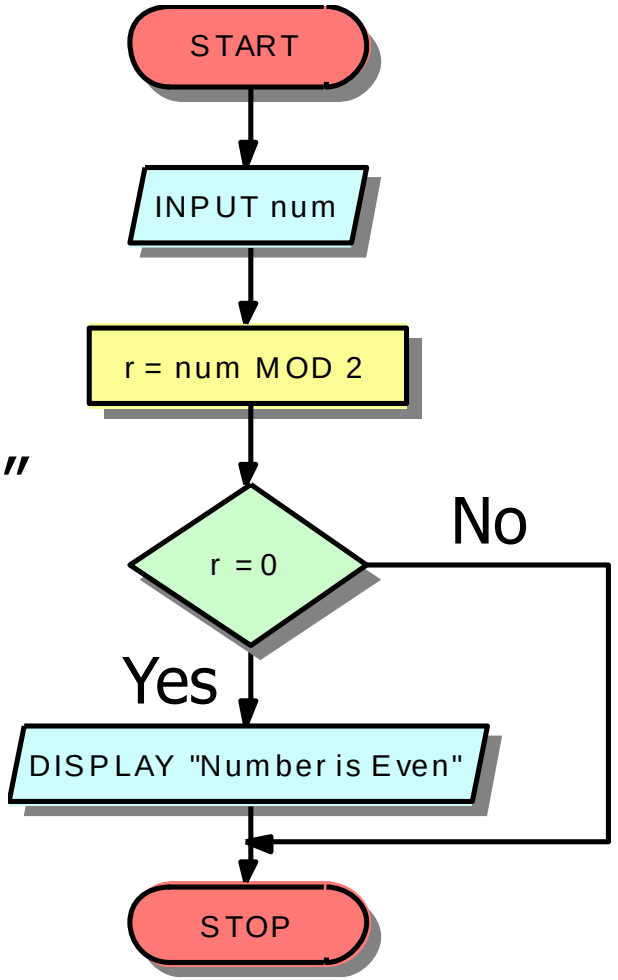
Process Symbol: Used here to add the two numbers

Input/Output Symbol: Used Here to Display the sum

Terminal Symbol: Used here to end the Flowchart

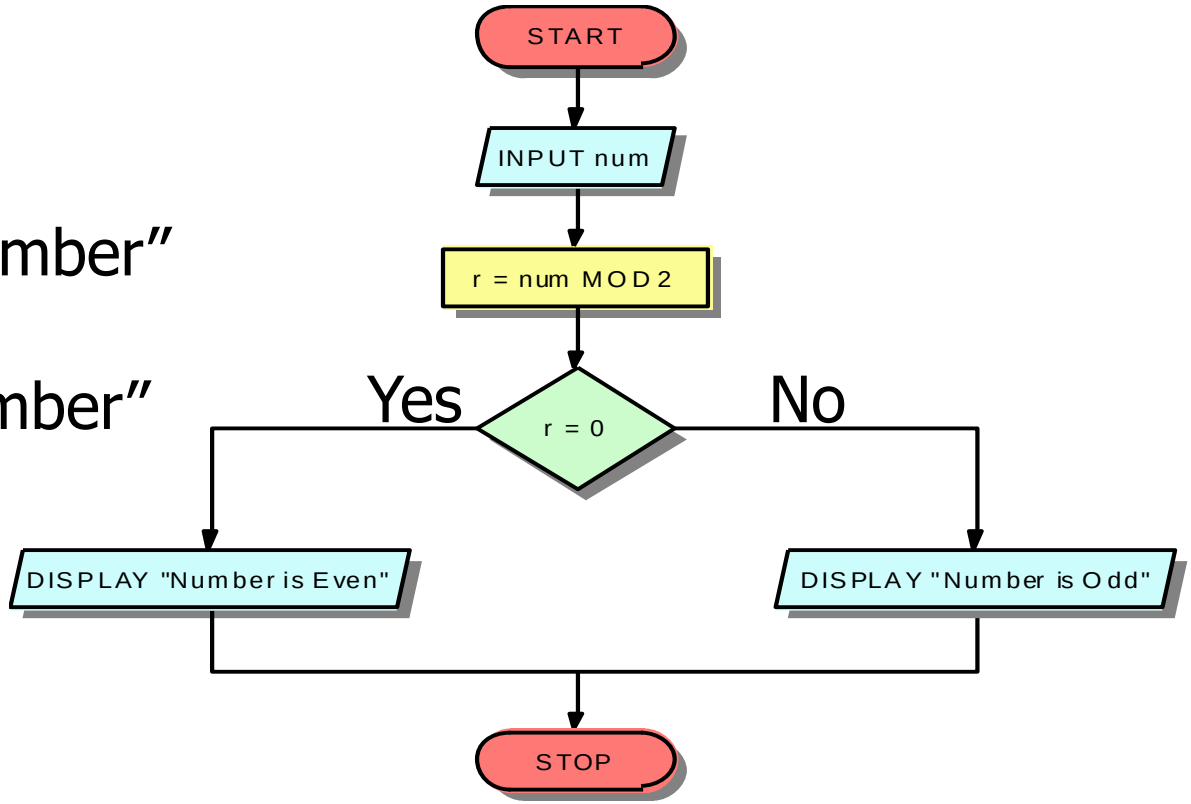
The IF Construct

```
BEGIN
    INPUT num
    r = num MOD 2
    IF r=0
        Display "Number is even"
    END IF
END
```



The IF-ELSE Construct

```
BEGIN
   INPUT num
   r=num MOD 2
   IF r=0
      DISPLAY "Even Number"
   ELSE
      DISPLAY "Odd Number"
   END IF
END
```



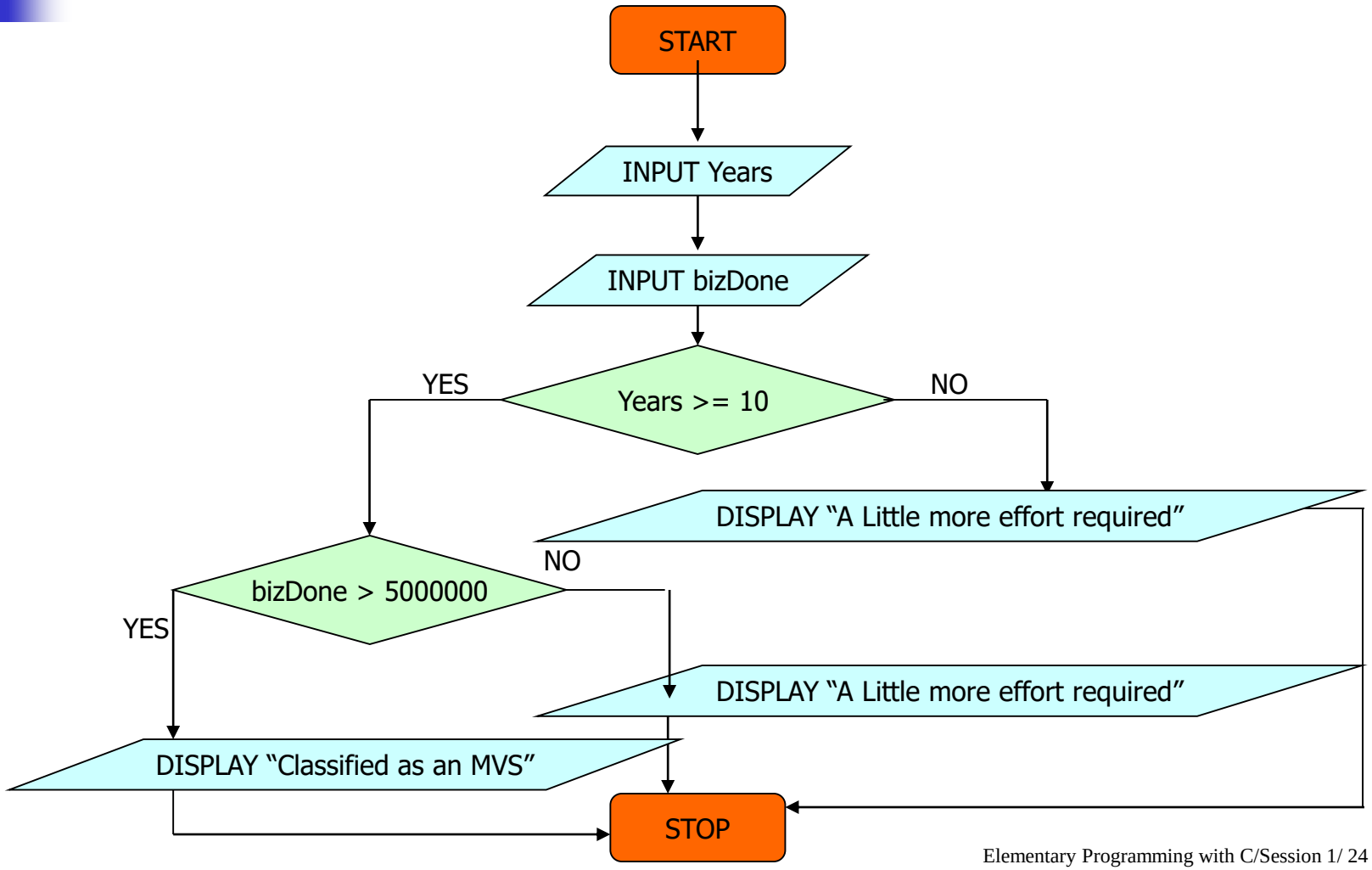
Multiple criteria using AND/OR

```
BEGIN
   INPUT years
   INPUT bizDone
   IF (years >= 10) AND (bizDone >=5000000)
         DISPLAY "Classified as an MVS"
   ELSE
         DISPLAY "A little more effort required!"
   END IF
END
```

Nested IFs-1

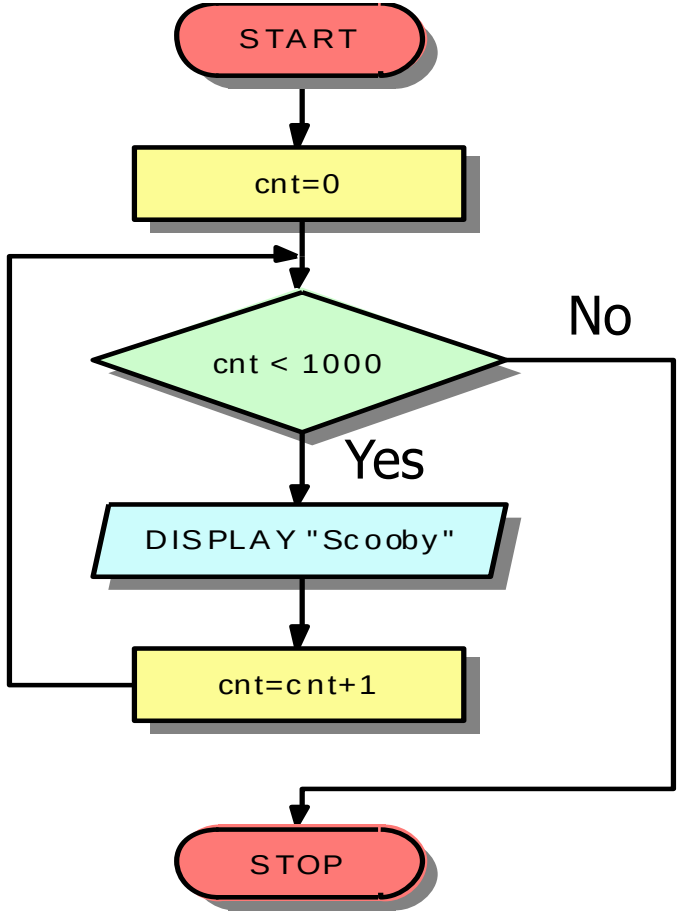
```
BEGIN
   INPUT years
   INPUT bizDone
   IF years >= 10
         IF bizDone >=5000000
             DISPLAY "Classified as an MVS"
         ELSE
             DISPLAY "A little more effort required!"
         END IF
   ELSE
       DISPLAY "A little more effort required!"
   END IF
END
```

Nested IFs-2


START
INPUT Years
INPUT bizDone
Years >= 10
YES
NO
DISPLAY "A Little more effort required"
bizDone > 5000000
NO
YES
DISPLAY "A Little more effort required"
DISPLAY "Classified as an MVS"
STOP

Loops

```
BEGIN
   cnt=0
   WHILE (cnt < 1000)
   DO
         DISPLAY “Scooby”
         cnt=cnt+1
   END DO
END
```



http://bit.ly/2K8IwP3