



SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

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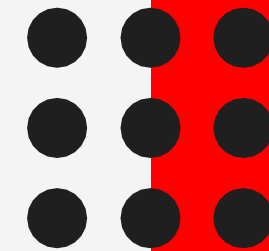
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8086 Assembler Directives



Assembler Directives

- Assembler directives are the commands to the assembler that direct the assembly process.
- They indicate how an operand is treated by the assembler and how assembler handles the program.
- They also direct the assembler how program and data should arrange in the memory.
- ALP's are composed of two type of statements.
- The instructions which are translated to machine codes by assembler.
- The directives that direct the assembler during assembly process, for which no machine code is generated.



Assembler Directives

ASSUME

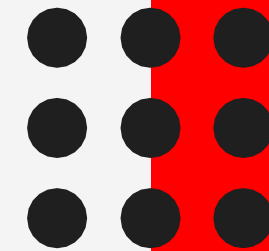
DB - Defined Byte.

DD - Defined Double Word

DQ - Defined Quad Word

DT - Define Ten Bytes

DW - Define Word



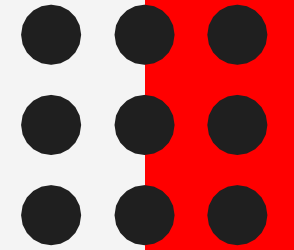
Assembler Directives

1. ASSUME: Assume logical segment name

Syntax: ASSUME segreg:segname,...segreg:segname

Ex: ASSUME CS:CODE

ASSUME CS:CODE,DS:DATA,SS:STACK



Assembler Directives

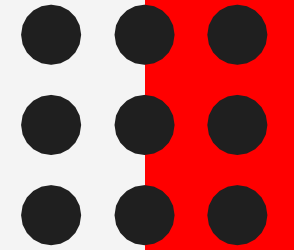
DB: Define Byte

The DB directive is used to reserve byte or bytes of memory locations in the available memory.

Syntax: Name of variable DB initialization value.

Ex: MARKS DB 35H,30H,35H,40H

NAME DB "VARDHAMAN"



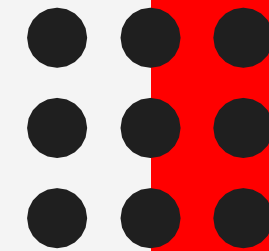
Assembler Directives

3. **DW**: Define Word

The DW directive serves the same purposes as the DB directive, but it now makes the assembler reserve the number of memory words(16-bit) instead of bytes.

Syntax: variable name DW initialization values.

Ex: WORDS DW 1234H,4567H,2367H



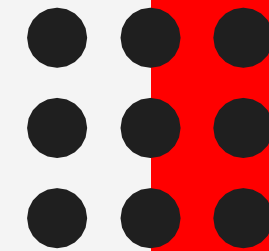
Assembler Directives

DD: Define Double:

The directive DD is used to define a double word (4bytes) variable.

Syntax: variable name DD 12345678H

Ex: Data1 DD 12345678H



Assembler Directives

DQ: Define Quad Word

This directive is used to direct the assembler to reserve 4 words (8 bytes) of memory for the specified variable and may initialize it with the specified values.

Syntax: Name of variable DQ initialize values.

Ex: Data1 DQ 123456789ABCDEF2H



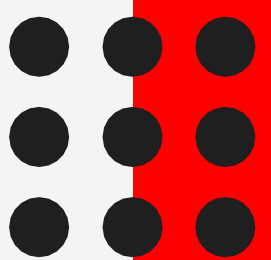
Assembler Directives (cont..)

DT: Define Ten Bytes

The DT directive directs the assembler to define the specified variable requiring 10 bytes for its storage and initialize the 10-bytes with the specified values.

Syntax: Name of variable DT initialize values.

Ex: Data1 DT 123456789ABCDEF34567H



Assembler Directives (cont..)

END: End of Program

The END directive marks the end of an ALP. The statement after the directive END will be ignored by the assembler.

ENDP: End of Procedure

The ENDP directive is used to indicate the end of procedure. In the AL programming the subroutines are called procedures.

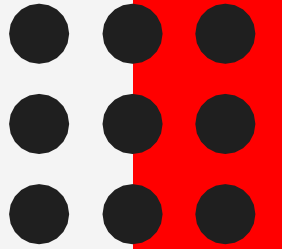
Ex: Procedure Start

:

Start ENDP



Assembler Directives (cont..)



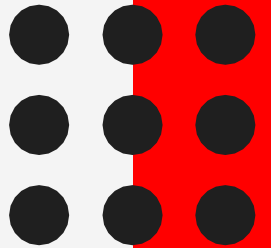
ENDS: End of segment

The ENDS directive is used to indicate the end of segment.

Ex: DATA SEGMENT

:

DATA ENDS



10. EVEN: Align on Even memory address

The EVEN directives updates the location counter to the next even address.

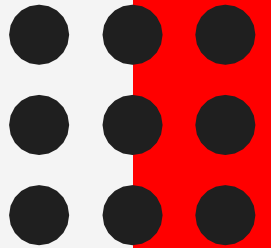
Ex: EVEN

Procedure Start

:

Start ENDP

The above structure shows a procedure START that is to be aligned at an even address.



EQU: Equate

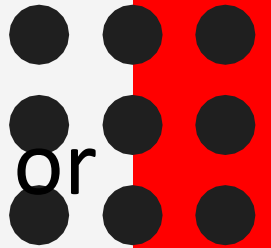
The directive EQU is used to assign a label with a value or symbol.

Ex: LABEL EQU 0500H

ADDITION EQU ADD

EXTRN: External and public

The directive EXTRN informs the assembler that the names, procedures and labels declared after this directive have been already defined in some other AL modules.



GROUP: Group the related segments

This directive is used to form logical groups of segments with similar purpose or type.

Ex: PROGRAM GROUP CODE, DATA, STACK

CODE, DATA and STACK segments lie within a 64KB memory segment that is named as PROGRAM.

LABEL: label

The label is used to assign name to the current content of the location counter.

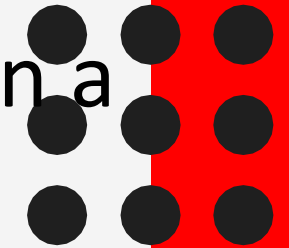
Ex: CONTINUE LABEL FAR

The label CONTINUE can be used for a FAR jump, if the program contains the above statement.

LENGTH: Byte length of a label

This is used to refer to the length of a data array or a string

Ex : MOV CX, LENGTH ARRAY



16.LOCAL: The labels, variables, constant or procedures are declared LOCAL in a module are to be used only by the particular module.

Ex : LOCAL a, b, Data1, Array, Routine

17.NAME: logical name of a module

The name directive is used to assign a name to an assembly language program module. The module may now be refer to by its declared name.

Ex : Name “addition”

18. **OFFSET:** offset of a label

When the assembler comes across the OFFSET operator along with a label, it first computing the 16-bit offset address of a particular label and replace the string ‘OFFSET LABEL’ by the computed offset address.

Ex : MOV SI, offset list



19. **ORG:** origin

The ORG directive directs the assembler to start the memory allotment for the particular segment, block or code from the declared address in the ORG statement.

Ex: ORG 1000H

20. **PROC:** Procedure

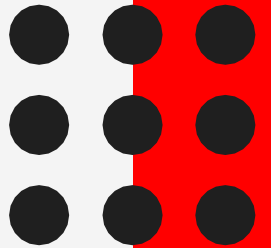
The PROC directive marks the start of a named procedure in the statement.

Ex: RESULT PROC NEAR
ROUTINE PROC FAR

PTR: pointer

The PTR operator is used to declare the type of a label, variable or memory operator.

Ex : MOV AL, BYTE PTR [SI] MOV BX, WORD PTR [2000H]





19. **SEG:** segment of a label

The SEG operator is used to decide the segment address of the label, variable or procedure.

Ex : MOV AX, SEG ARRAY MOV DS, AX

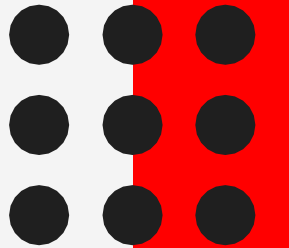
23. **SEGMENT:** logical segment

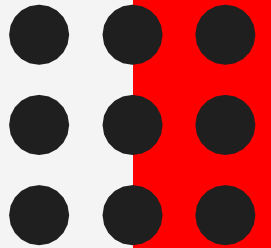
The segment directive marks the starting of a logical segment

Ex: CODE SEGMENT: CODE ENDS

24.**SHORT:** The SHORT operator indicates to the assembler that only one byte is required to code the displacement for jump.

Ex : JMP SHORT LABEL





25.TYPE:

The TYPE operator directs the assembler to decide the data type of the specified label and replaces the TYPE label by the decided data type.

For word variable, the data type is 2.

For double word variable, the data type is 4. For byte variable, the data type is 1.

Ex : STRING DW 2345H, 4567H MOV AX, TYPE STRING
AX=0002H

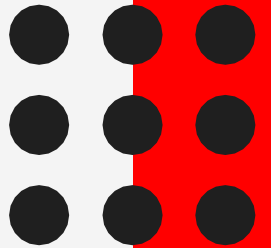


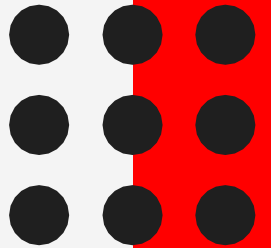
26. **GLOBAL**: The labels, variables, constants or procedures declared GLOBAL may be used by other modules of the program.

Ex : ROUTINE PROC GLOBAL.

27. **FAR PTR**: This directive indicates the assembler that the label following FAR PTR is not available within the same segment and the address of the label is of 32-bits i.e 2-bytes of offset followed by 2-bytes of segment address.

Ex : JMP FAR PTR LABEL





1.The directive used to inform the assembler, the names of the logical segments to be assumed for different segments used in the program is

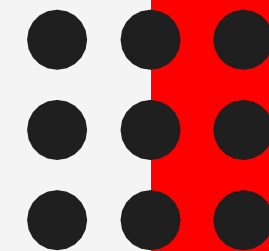
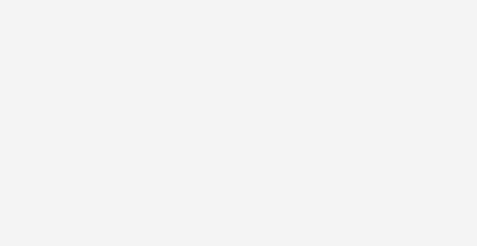
- a) ASSUME
- b) SEGMENT
- c) SHORT
- d) DB

2.The directive that marks the end of a logical segment is

- a) ENDS
- b) END
- c) ENDS & END
- d) None of the mentioned

3.The directive that updates the location counter to the next even address while executing a series of instructions is

- a) EVN
- b) EVEN
- c) EVNE



THANK YOU