# Allocating Storage Space for Initialized Data

تخصيص مساحه تخزين للبياناتا المعرفه مسبقا

The syntax for storage allocation statement for initialized data is −

[variable-name] define-directive initial-value [,initial-value]...

Where, *variable-name* is the identifier for each storage space. The assembler associates an offset value for each variable name defined in the data segment.

There are five basic forms of the define directive −

|  |  |  |
| --- | --- | --- |
| **Directive** | **Purpose** | **Storage Space** |
| DB | Define Byte | allocates 1 byte |
| DW | Define Word | allocates 2 bytes |
| DD | Define Doubleword | allocates 4 bytes |
| DQ | Define Quadword | allocates 8 bytes |
| DT | Define Ten Bytes | allocates 10 bytes |

Following are some examples of using define directives −

choice DB 'y'

number DW 12345

neg\_number DW -12345

big\_number DQ 123456789

real\_number1 DD 1.234

real\_number2 DQ 123.456

* Each byte of character is stored as its ASCII value in hexadecimal.
* Each decimal value is automatically converted to its 16-bit binary equivalent and stored as a hexadecimal number.
* Processor uses the little-endian byte ordering.
* Negative numbers are converted to its 2's complement representation.
* Short and long floating-point numbers are represented using 32 or 64 bits, respectively.

# Allocating Storage Space for Uninitialized Data

تخصيص مساحه للبيانات الغير معرفه

The reserve directives are used for reserving space for uninitialized data. The reserve directives take a single operand that specifies the number of units of space to be reserved. Each define directive has a related reserve directive.

There are five basic forms of the reserve directive −

|  |  |
| --- | --- |
| **Directive** | **Purpose** |
| RESB | Reserve a Byte |
| RESW | Reserve a Word |
| RESD | Reserve a Doubleword |
| RESQ | Reserve a Quadword |
| REST | Reserve a Ten Bytes |

Multiple Definitions

You can have multiple data definition statements in a program. For example −

choice DB 'Y' ;ASCII of y = 79H

number1 DW 12345 ;12345D = 3039H

number2 DD 12345679 ;123456789D = 75BCD15H

The assembler allocates contiguous memory for multiple variable definitions.

Multiple Initializations

The TIMES directive allows multiple initializations to the same value. For example, an array named marks of size 9 can be defined and initialized to zero using the following statement −

marks TIMES 9 DW 0

The TIMES directive is useful in defining arrays and tables. The following program displays 9 asterisks on the screen −