Assembly Language Program

- Series of statements which are either assembly language instructions or directives.
  - Instructions are statements like ADD AX,BX which are translated into machine code.
  - Directives or pseudo-instructions are statements used by the programmer to direct the assembler on how to proceed in the assembly process.
Assembly Language Program

- Statement format:
  - [label:] mnemonic [operands][;comments]

- Label:
  - Cannot exceed 31 characters.
  - Consists:
    - Alphabetic characters both upper and lower case.
    - Digits 0 through 9.
    - Special characters ( ? ), ( . ), ( @ ), ( _ ), and ( $ ).
  - The first character cannot be a digit.
Assembly Language Program

- **Label:**
  - The period can only be used as the first character, but its use is not recommended. Several reserved words begin with it in later versions of MASM.
  - Must end with a colon when it refers to an opcode generating instruction.
  - Do not need to end with a colon when it refers to a directive.
Assembly Language Program

- Mnemonic and operands:
  - Instructions are translated into machine code.
  - Directives do not generate machine code. They are used by the assembler to organize the program and direct the assembly process.
Assembly Language Program

- Comments:
  - Begin with a “;”.
  - Ignored by the assembler.
  - Maybe be on a line by itself or at the end of a line:
    - ;My first comment
    - MOV AX,1234H ;Initializing....
  - Indispensable to the programmers because they make it easier for someone to read and understand the program.
Program Termination

- Use the software interrupt call:
  - MOV AH,4CH
  - INT 21H
  - *Always return control to the OS.*
Text Editors

- Use the following text editors to write your programs.
  - Notepad (Windows).
  - Edit (DOS).
  - Or any other editor capable of generating ASCII files.
Assembling a Program

To be able to create an executable program you will need to first assemble the program assembler source file, generating an object file, then you must link this object file to create a executable one.
Assembling a Program

- TASM PROG2A.ASM /L
  - The /L flag generates a very useful listing file called PROG2.LST
- TLINK PROG2.OBJ
- Execute program or use Debug to check it.