Assembly Process (from .asm to .obj)

First Pass:

work > work.asm

```
1     .ORIG x3050
2     LD R1, SIX
3     LD R2, NUMBER
4     AND R3, R3, #0
5
6   AGAIN   ADD R3, R3, R2
7     ADD R1, R1, #-1
8     BRp AGAIN
9
10    HALT
11
12  NUMBER  .BLKW 1
13  SIX .FILL x0006
14    .END
```

scan program file, find all labels and calculate the corresponding addresses, which is called Symbol Table (work.sym)

work > work.sym

```
1   //Symbol Name        Page Address
2   //------------------  ------------
3   //  AGAIN                    3053
4   //  NUMBER                   3057
5   //  SIX                      3058
```

Second Pass:

convert instructions to machine language, using information from symbol table.

work > work.lst

```
1   (0000) 3050  0011000001010000 (   1)                .ORIG x3050
2   (3050) 2207  0010001000000111 (   2)                LD    R1 SIX
3   (3051) 2405  0010010000000101 (   3)                LD    R2 NUMBER
4   (3052) 56E0  0101011011100000 (   4)                AND   R3 R3 #0
5   (3053) 16C2  0001011011000010 (   6) AGAIN          ADD   R3 R3 R2
6   (3054) 127F  0001001001111111 (   7)                ADD   R1 R1 #-1
7   (3055) 03FD  0000001111111101 (   8)                BRP   AGAIN
8   (3056) F025  1111000000100101 (  10)                TRAP  x25
9   (3057) 0000  0000000000000000 (  13) NUMBER         .FILL x0000
10  (3058) 0006  0000000000000110 (  13) SIX            .FILL x0006
```