

CEN 214 Microprocessors Lab Assignment 5

New Instructions:

STOSB

Description: Stores a byte from AL register into memory location (specified by ES: DI registers). DI register is updated. If the DF flag is 0, the register is incremented by 1; if the DF flag is 1, the register is decremented by 1.

Algoritma : • $ES:[DI] = AL$

- if $DF = 0$ then
 $DI = DI + 1$
- else
 $DI = DI - 1$

STOSW

Description: Stores a word from AX register into memory location (specified by ES: DI registers). DI register is updated. If the DF flag is 0, the register is incremented by 2; if the DF flag is 1, the register is decremented by 2.

Algoritma : • $ES:[DI] = AX$

- if $DF = 0$ then
 $DI = DI + 2$
- else
 $DI = DI - 2$

LODSB

Description: Loads a byte from the memory location (specified by DS: SI registers) into AL register. DI register is updated. If the DF flag is 0, the register is incremented by 1; if the DF flag is 1, the register is decremented by 1.

Algoritma : • $AL = DS:[SI]$

- if $DF = 0$ then
 $SI = SI + 1$
- else
 $SI = SI - 1$

LODSW

Description: Loads a word from the memory location (specified by DS: SI registers) into AX register. DI register is updated. If the DF flag is 0, the register is incremented by 2; if the DF flag is 1, the register is decremented by 2.

Algoritma : • $AX = DS:[SI]$

- if $DF = 0$ then
 $SI = SI + 2$
- else
 $SI = SI - 2$

MOVSW

Description: Moves the byte, word specified with the second operand (source operand) to the location specified with the first operand (destination operand). Both the source and destination operands are located in memory. The address of the source operand is read from the DS: SI registers. The address of the destination operand is read from the ES: DI registers. The DS segment may be overridden with a segment override prefix, but the ES segment cannot be overridden.

Algoritma :

- $ES:[DI] = DS:[SI]$
 - if $DF = 0$ then
 - SI = SI + 2
 - DI = DI + 2
 - else
 - SI = SI - 2
 - DI = DI - 2

CLD

Description: Clears the DF flag in the EFLAGS register. When the DF flag is set to 0, string operations increment the index registers (ESI and/or EDI). Operation is the same in all modes.

Algoritma :

- $DF = 0$

STD

Description: Sets the DF flag in the EFLAGS register. When the DF flag is set to 1, string operations decrement the index registers (ESI and/or EDI). Operation is the same in all modes.

Algoritma :

- $DF = 1$

REP

Description: Repeats a string instruction the number of times specified in the count register.

Algoritma :

- $CX = CX - 1$
 - if $CX \neq 0$ then
 - Do chain instruction
 - else
 - continue

Examples:

1. Write a program that stores value of BCDEh between 0100:0300h and 0100:03FFh memory addresses.
2. Write a program that reads values between 0100:0300h and 0100:03FFh, subtracts 1234h from these values and writes results back to the same addresses.
3. Write a program that reads values between 0100:0300h and 0100:03FFh memory address, and writes back these values to the memory address between 0100:3500h and 0100:35FFh.