ASSIGNMENT 1

1. Use the FILL command (F) to initialize the 10h storage locations starting at DS:10 with the value 11h, the 10h storage locations starting at address DS:30 with 22h, the 10h storage locations starting at address DS:50 with 33h, and the 10h storage locations starting at address DS:70 with 44h.

   In debug125,
   -F DS:0010 L 10 11
   -F DS:0030 L 10 22
   -F DS:0050 L 10 33
   -F DS:0070 L 10 44

2. Verify the result of step 6 using the DUMP command.

   To see result in debug125,
   -D DS:0010

3. Use the ENTER command (E) to load locations CS:50, CS:52, and CS:54 with AA, BB, and CC, respectively.
   -E CS:50 “AA”
   -E CS:52 “BB”
   -E CS:54 “CC”

4. What is the extension of the file produced by the linker?

   Extensions for the file produced by the linker are .exe and .map.

5. Which debug commands allows us to see the memory contents?

   D command (Dump) allow us to see the memory contents.

6. What is the difference between a logical address and a physical address?

   Logical address is generated by CPU in perspective of program which does not exist physically in the memory unit, where the physical address is actual location that exists in memory unit. logical address is generated by the CPU, on the other hand physical address is computed by MMU.

7. Show how a physical address is generated from a logical address.

   Physical address is generated from logical address with MMU(memory management unit).MMU make address translation of logical address and output of that process is appropriate physical address.

8. What are the following registers used for: DS, CS, SS, SP, IP, AX .

   DS is data segment register, that can modify content of data segment.
   CS is code segment register, only microprocessor's compiler can modify it.
   SS is stack segment register, this stores information about memory segment.
   SP is stack pointer, it points to the current top value of the stack.
   IP is instruction pointer, it stores the address of next instruction that is going to be executed. AX is accumulator register, mostly used in arithmetic, logic and data transfer instructions.

9. Define the function each of the following flag bits in the flag register: Overflow, Carry, Sign, and Zero.

   Overflow flag(O) is set to 1 when result of operation is too large to fit in number of bits available for it, otherwise it gives 0.
   Carry bit(CY) is set to 1 if there is carry generated after completion of operation.
   Sign bit(S) is set to 1 if MSB of result is 1(that indicates the result is negative), else sign bit is set to 0 if MSB of result is 0(that indicates the result is positive).
   Zero bit(Z) is set to 1 if final result comes as 0, else it is set to 0.

10. Use a REGISTER command to first display the current contents of IP and then change this value to 0300h.

    In debug125,
    -R IP
    IP 0100:0300

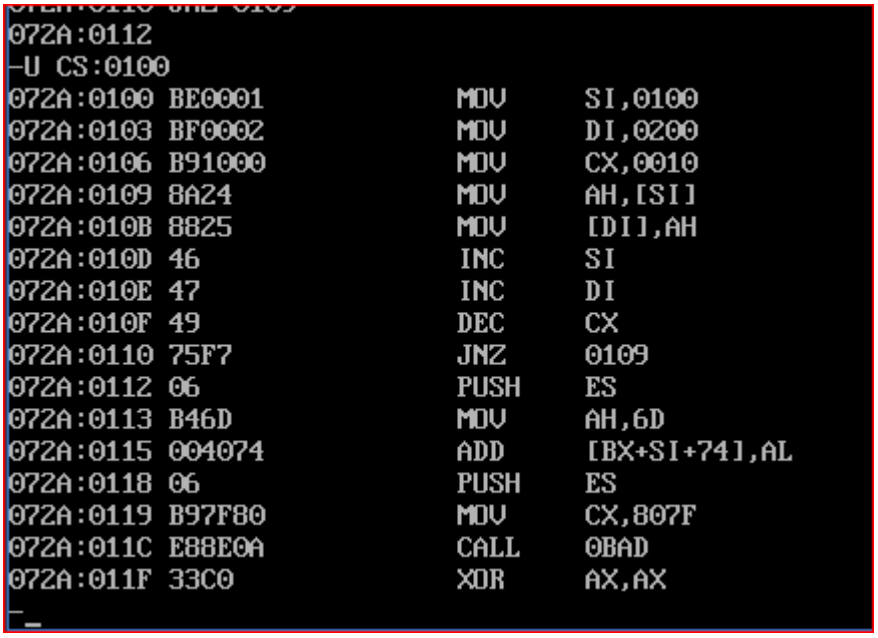
11. Use a REGISTER command to first display the current contents of the flag register and then reset the overflow, sign, and auxiliary flags.

    -R F
    NV UP EI NG NZ NA PO NC : NV PL NA

12. Using the ASSEMBLE command (A), load the program shown below into memory starting at address CS: 0100.

a.
```
        MOV   SI, 0100H
        MOV   DI, 0200H
        MOV   CX, 010H
BACK:   MOV   AH, [SI]
        MOV   [DI], AH
        INC SI
        INC DI
        DEC   CX
        JNZ   BACK
```

b. Verify the loading of the program by displaying it with the UNASSEMBLE (U) command.



c. How many bytes of memory does the program take up?
   18

d. What is the machine code for the DEC CX instruction?
   49

e. What is the address offset for the label BACK?
   0109

13. What are the difference between T, G and P debug commands.

G(Go) debug command execute program from current memory location. T(Trace) debug command trace one or more instruction from current location or optional location. P(Proceed) execute one or more instructions.
In G command we can add breakpoint for executing operation, if breakpoint is not mentioned it proceed till end of program. Where in T command if we don't mention

count of instruction it will trace next instruction. T command trace into instructions, on other hand P command execute instructions.