Assignment 4

“I confirm that I will keep the content of this assignment confidential. I confirm that I have not received any unauthorized assistance in preparing for or writing this assignment. I acknowledge that a mark of 0 may be assigned for copied work.”

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***Section 1***

Question 1:

1. List the 3 operands types. (1 point)

|  |  |  |
| --- | --- | --- |
| * Immediate | * Register | * Memory |

1. What are the four essential status flags? (2 points)

|  |  |
| --- | --- |
| * Sign Flag | * Zero Flag |
| * Carry Flag | * Overflow Flag |

1. All two-operand instructions are in the form: OpCode Destination, Source (1 point)

* True

1. How can we scale an indirect or indexed operand to the offset of an array element? (2 points)

* We can scale an indirect by multiplying the index by the array’s type.

1. What are the two situations in which the overflow flag is set? (2 points)
   1. Overflow flag will be set when the signed result of an operation is invalid
   2. Overflow flag will be set the signed result of an operation is out of range
2. What does the LENGTHOF operator do: (2 points)
   * The LENGTHOF operator returns the number of elements in an array.

Question 2:

1. What will be the value in EDX after each of the lines marked (a) and (b) execute? (4 points)

.data

one WORD 8002h

two WORD 4321h

.code

mov edx,21348041h

movsx edx,one ; (a)

movsx edx,two ; (b)

* 1. EDX = FFFF8002
  2. EDX = 00004321

1. What will be the value of the Parity flag after the following lines execute? (2 points)

mov al,1

add al,3

* 1. PF = 1
  2. PF = 0

1. Explain briefly one difference between direct and indirect addressing. (5 points)

|  |  |
| --- | --- |
| Direct Addressing | Indirect Addressing |
| * Provides the full address of the main memory in the instruction where the address is stored. | * The address is stored at the address field of the instruction. |
| * One memory reference required in the direct mode. | * Two memory reference require in the indirect mode. |
| * While executing the instruction, the supplementary calculation is not required. | * While executing the instruction, more computations are required. |
| * Is faster than indirect addressing | * Is slower than direct addressing |

1. Explain why each of the following MOV statements are invalid: (5 points)

.data

bVal BYTE 100b

Val2 BYTE ?

wVal WORD 2

dVal DWORD 5

.code

mov ds,45 ; **Immediately moves to DS are not permitted**

mov ah,wVal ; **Size mismatched**

mov eip,dVal ; **eip can never be a destination in the mov**

mov 25,bVal ; **immediate value can never be a destination in the mov**

mov bVal2,bVal ; **Memory to memory mov is not permitted**

1. What are the four main tasks of the LABEL Directive? (4 points)
   1. Gives an alternative size attribute to an existing storage location
   2. Gives an alternative name to an existing storage location
   3. Does not allow any storage
   4. Removes the need for the PTR operator