

## EE213 Computer Organization and Assembly Language

## Assignment II – Spring 2019

**Open Date:** Sunday 28<sup>th</sup> April, 2019 (1500HRS)

**Due Date:** Friday 2<sup>nd</sup> May, 2019 (2300HRS)

**Q1:** Answer the following questions:

1. What are addressing modes? Elaborate, with examples, each of the following addressing modes:
  - Register Address                      - Immediate Addressing                      - Direct Addressing
  - Register Indirect Addressing                      - Direct Indexed Addressing                      -Base Relative Addressing
  - Base Indexed Addressing
2. Draw out the instruction execution cycle
3. How reading from memory is different than reading from register.
4. How a stack segment is different from data segment?
5. With the help of some practical example prove why sign extension is necessary before signed division (IDIV).
6. Implement a procedure to display the following pyramid where each element is twice of its successor, implement till 5 levels:

		1		
	2	4	8	
16	32	64	128	256 ....

7. How stack parameters are advantageous over register parameters?
8. How array is passed in the parameters list through arguments? Write a snippet.

**Q2: (Recursion)** Construct an x86 Assembly Program that should calculate and display first 10 elements of Fibonacci Series through recursion, draw out stack frame and show the values of EIP and ESP after each recursive call.

**Q3: (Encryption/Decryption)** Construct an assembly program where you would have implemented 4 different levels of Encryption. Also implement the procedures to decrypt for level of encryption.

**Q4: (Arrays)** Implement a 2D array of 4 Rows and 6 Columns, and display the Average of each row, column and whole the table.

**Q5: (Encoding):** Assemble the following instructions write the hexadecimal machine language bytes for each labeled instructions, it is necessary to show the working :

- ✓ **CBW**
- ✓ **INT 21h**
- ✓ **PUSH AX**
- ✓ **SUB CX, 15**
- ✓ **ADD CL, CH**
- ✓ **SUB VAR, BX**
- ✓ **SUB BX, [101Fh]**
- ✓ **XOR [DI+07h], DX**
- ✓ **OR [SI+347Ch], Bh**
- ✓ **POP mem16**
- ✓ **INC mem8**
- ✓ **INC WORD PTR [100Fh]**
- ✓ **DEC WORD PTR [BX+02h]**
- ✓ **DEC WORD PTR [DI+767Fh]**
- ✓ **SUB VAR, 15**
- ✓ **SUB [SI+1fh], 15**
- ✓ **SUB [SI+1f1fh], 15**

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