Homework – Segmented Memory Model

Deadline: Monday 2nd November, 2020

Important Instructions: Make one PDF file of your solution. Your file name should be your roll number.

Physical Address Calculation: If segment register e.g. DS has value XXXX and offset register e.g. BX has value YYYY then memory access **mov [BX], 5** is referring to logical address (XXXX:YYYY) and its corresponding physical address can be calculated as a 20-bit number (XXXX0 + 0YYYY).

Segment Registers in iAPX88: CS, DS, ES, SS

Offset Registers in iAPX88: BX, SI, DI, BP, SP, IP

Question 1 - Fill-in the table for the Segment register values given below and answer following questions:

Segment Register Value	Minimum value in Offset Register	Maximum value in Offset Register	Range of Logical Addresses	Minimum Physical Address	Maximum Physical Address	Segment window range in (1MB) Physical Memory
0000	0000	FFFF	0000:0000 to 0000:FFFF	00000 + 00000 = 00000	00000 + 0FFFF = 0FFFF	00000 to 0FFFF
0001						
0002						
0003						
000A						
000F						
0010						
001F						
FFFE						
FFFF						

Findings from above table:

a. If value of a segment register CS is 0xABCD

i. What is the starting (physical) address of Code Segment in 1MB memory? _____

ii. What is the range of logical addresses of this segment? _____

iii. What is the range of this Code Segment in 1MB Memory? _____

iv. What is the size of this Code Segment and Why? _____

b. If CS = 0x0000 and DS = 0x0001

i. Are these segments overlapping? _____

ii. Are they fully overlapping or partially overlapping? _____

iii. What is overlapping memory space in these segments?_____

iv. Logical Addresses of overlapping space range between (0000 : ____) to (0000 : _____)
Or (0001 : _____) to (0001 : _____)

c. If CS = 0xFFFE, draw memory configuration of Code Segment. (Submission not required.)

Book Exercise Questions (Sir Bilal Hashmi Notes):
Chapter 1: 17, 18, 19
Chapter 2: 3, 4, 5, 7, 8