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Index NO:- 210206B

Section 01

- Try out examples provided with smz32 simulator
- Modify some of those examples to implement detailed behavior such as using signal lights
- Develop a new Assembly program to calculate the products of integers from 1 to 5
- Display the results of the product calculation on 7-segment displays

Section 02

1) 01FIRSTMulti

```
; ===== WORK OUT 10 MULTIPLY BY 5 ============================
        CLO             ; Close unwanted windows.
        MOV AL,10       ; Copy a 10 into the AL register.
        MOV BL,5        ; Copy a 5 into the BL register.
        MUL AL,BL       ; MULTIPLY AL to BL. Answer goes into AL.
        END             ; Program ends
; ===== Program Ends ========================================
```

2) 01FIRSTDiv

```
; ===== WORK OUT 10 by 0 =====================================
        CLO             ; Close unwanted windows.
        MOV AL,10       ; Copy a 10 into the AL register.
        MOV BL,0        ; Copy a 0 into the BL register.
        DIV AL,BL       ; Divide AL to BL. Answer goes into AL.
        END             ; Program ends
; ===== Program Ends ========================================
```

3) 01FIRSTSub

```
; ===== WORK OUT 69 minus 27 =================================
        CLO             ; Close unwanted windows.
        MOV AL,69       ; Copy a 69 into the AL register.
        MOV BL,27       ; Copy a 27 into the BL register.
        SUB AL,BL       ; SUBTRACT AL to BL. Answer goes into AL.
        END             ; Program ends
; ===== Program Ends ========================================
```

4) Traffic Light – 210206_08

```
; ===== CONTROL THE TRAFFIC LIGHTS ============================

        CLO             ; Close unwanted windows.
Start:

        MOV AL,84       ; Copy 10000100 into the AL register.
        OUT 01          ; Send AL to Port One (The traffic lights).
    MOV     BL,A    ; A long delay.
    CALL    30      ; Call the procedure at address [30]

    MOV AL,48       ; Copy 01001000 into the AL register.
        OUT 01          ; Send AL to Port One (The traffic lights).
    MOV     BL,1    ; A short delay.
    CALL    30      ; Call the procedure at address [30]

    MOV AL,30       ; Copy 00110000 into the AL register.
        OUT 01          ; Send AL to Port One (The traffic lights).
    MOV     BL,5    ; A middle delay.
    CALL    30      ; Call the procedure at address [30]

        JMP Start       ; Jump back to the start.


; ----- Time Delay Procedure Stored At Address [30] ----------
        ORG     30      ; Generate machine code from address [30]
        PUSH    BL      ; Save BL on the stack.
        PUSHF           ; Save the CPU flags on the stack.
Rep:
        DEC     BL      ; Subtract one from BL.
        JNZ     REP     ; Jump back to Rep if BL was not Zero.

        POPF            ; Restore the CPU flags from the stack.
        POP     BL      ; Restore BL from the stack.

        RET             ; Return from the procedure.
; ------------------------------------------------------------
        END
; ------------------------------------------------------------

; ===== Program Ends ========================================
```

5) 7 Segment Disply – 210206B_10

```
; ================================================
; ===== 99sevseg.asm ==============================
; ===== Seven Segment Displays Port 02 ============
;My index no:- 210206B
Start:
        MOV   AL,FA  ; 1111 1010
        OUT   02     ; Send the data in AL to Port 02

        MOV   AL,FB  ; 1111 1011
        OUT   02     ; Send the data in AL to Port 02

        MOV   AL,FD  ; 1111 1101
        OUT   02     ; Send the data in AL to Port 02

        END
; ================================================
```

6) Multiply all integers from 1 to 5 – 210206B_11

```
; ===== Multiply all integers from 1 to 5 ======================
        CLO             ; Close unwanted windows.
        MOV AL,5        ; Copy a 5 into the AL register.
        MOV BL,1        ; Copy a 1 into the BL register.

MUL:


        MUL BL,AL       ; MULTIPLY AL to BL. Answer goes into BL.
    DEC AL          ; Subtract one from AL.
        JNZ MUL             ; Jump back to MUL if AL is not 0



    MOV     AL,FA   ; 1111 1010 -> 0
        OUT   02     ; Send the data in AL to Port 02

        MOV   AL,FB  ; 1111 1011 -> 0
        OUT   02     ; Send the data in AL to Port 02

        MOV   AL,8A  ; 1000 1010 -> 7
        OUT   02     ; Send the data in AL to Port 02
```

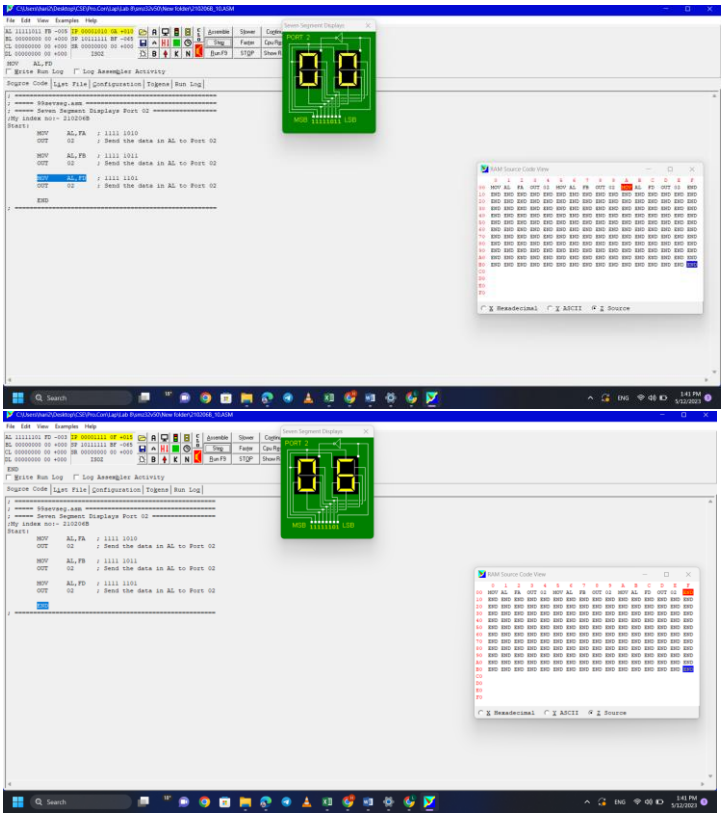
```
        MOV    AL,FF    ; 1111 1111 -> 8
        OUT    02       ; Send the data in AL to Port 02

        END

; ===== Program Ends ========================================
```

Section 03

1)7 Segment Display



2)Traffic Light