

FEW PROGRAMS ASKED IN UNIVERSITY EXAM



2(b): Write an 8085 program for the following type of addition
 $1^2+2^2+3^2+\dots\dots\dots+9^2$ (Spring 2015,7 marks)

Solution:

Note: Total sum is more than 255D, so you cannot use 8-bit addition in this case, so use HL register and DAD instruction to use 16-bit addition

LXI H,0000H

MVI C,00H

UPDATE: INR C

XRA A ;initialize the sum to 0

MOV B,C

AGAIN: ADD C

DCR B

JNZ **AGAIN** ;repeat the addition to calculate the square

MOV E,A ; make 8 bit data to 16 bit data in DE

MVI D, 00H ; Make D reg 00H

DAD D ; sum (HL) = sum + computed square

MVI A,09H

CMPC

JNZ **UPDATE** ; C is still not 9, repeat it until the last square to be found

HLT



3(b): Write a program to take input from 4-switches connected to PC3-PC0 and display the status of the switches to 4 LEDs connected to PC7-PC4 of 8255 PPI **(Spring 2015, 7 marks)**

Solution:

See Example 15.1 in page number 463

Note1: Read the question first. Analyze it. Determine what are the things you need to assume and calculate before writing the code.

Note2: C_{LOWER} has to be configured as an input port. C_{UPPER} has to be configured as an output port. For that you will need to write a control word in the control register of the 8255 PPI. In addition to this, **port C** should be configured in **mode 0**. To write the control word in the control register, you need to know the port address of the port C first! How can you find that ? See **Figure 15.3** for that ! The question is incomplete in this sense. Thus you need to assume the port addresses. Let us consider that **port A** has address **8000H**, then for sure, **port B** , **port C** and **control register** will have port addresses **8001H**, **8002H** and **8003H**. (memory-mapped I/O)



Identify the mode 0 control word to configure port A and port C_U as output ports and port B and port C_L as input ports.

D7	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀	Hex
1	0	0	0	0	0	1	1	83H
I/O function	Port A in Mode 0	Port A = Outport	Port C_U = output	Port B in Mode 0	Port B = Input	Port C_L = Input		

Program:

MVI A,83H	;Load accumulator with the control word
STA 8003H	;Write word in the control register to initialize the ports
LDA 8002H	; Read switches at C _{LOWER}
ANI 0FH	; Mask the upper four bits of port C, these bits are not input data
RLC	; Rotate and place data in the upper half of the accumulator
RLC	
RLC	
RLC	
STA 8002H	; Display data at port C _{UPPER}
HLT	



5(b): Write an 8086 program to find square root of a given number. Given that number is a perfect square of two digits.(**Spring 2015,8 marks**)

Solution:

.MODEL SMALL

.STACK 100H

.DATA

SQUARE1 **DW** 81D **;PERFECT SQUARE**
SQUAREROOT1 **DB** 0D **;SQUARE ROOT WILL BE A DB**

.CODE

.STARTUP

MOV CL,00H **;INITIALIZE CL TO 00H**
MOV BX,SQUARE1
LOOP1:INC CL
MOV AL,CL
MUL AL
CMP AX,BX
JNZ LOOP1
MOV SQUAREROOT1,CL **;SQUARE ROOT FOUND WHICH IS AT CL**

.EXIT

END



2(b): Write an ALP in 8085 to find whether the given number is palindrome or not (Fall 2016 ,8 marks)

Solution:

Assume the number to be checked is at 2400H. If it is a palindrome number, store FFH at 2700H, else store EEH at 2700H

(Note that A5H is palindrome and B5H is not a palindrome number)

;extract each bit and save as a number starting from 2500H

```
LDA 2400H
MOV H,A
LXI D,2500H
MVI C,08H           ;set up a counter

AGAIN: MOV A,H
RAL
MOV H,A
MVI A,00H
ADC A                ; get the carry as a number!
STAX D
INX D
DCR C
JNZ AGAIN
```



;now 2500H to 2507H contains each bit as a number starting from MSB first.

; now perform the palindrome check, point DE to 2507H and HL to 2500H

DCX D ; remember to point DE to the last number
;stored (i.e 2507H)

MVI C,08H ; set up a counter

LXI H,2500H ; DE already points to 2507, so use HL to point
;2500H

REPEAT: MOV B,M

LDAX D

SUB B ;subtract two numbers

JNZ **NO_PALINDROME**

INX H

DCX D

DCR C

JNZ REPEAT

MVI A,FFH

JMP **FINISH**

NO_PALINDROME: MVI A,EEH

FINISH: STA 2700H

HLT



THANK YOU

