Problem specification

If count = 05

9000H	05
9001H	04
9002H	03
9003H	02
9004H	01

9000H	01
9001H	02
9002H	03
9003H	04
9004H	05

Ascending order

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SORTING

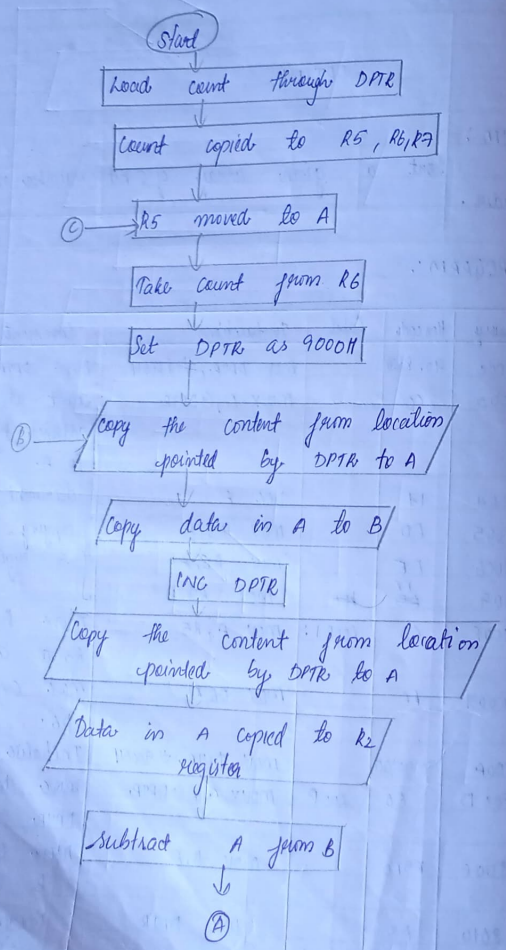
1) AIM:

Sort a given array of 8 bit number in ascending order.

PROGRAM:

Memory	Hex code	Label	Instructions	Comments
8000	90: 86:6		MOV DPTR, # 8666H	move DPTR to 8666H
8003	E0		MOVX A, @DPTR	count at 8666H addressed by DPTR moved to A.
8004	14		DEC A	decrement the count
8005	FD		MOV R5, A	copying the count to 3 registers R5, R6, R7
8006	FE		MOV R6, A	
8007	~~ED~~ FF	~~LOO~~	MOV R7, A	
8008	ED	LOOP1:	MOV A, R5	move the content from R5 to accumulator A
8009	FE		MOV R6, A	move content from A to R6.
800A	90:90:00		MOV DPTR, # 9000H	Initialise DPTR to 9000H.
800D	E0	LOOP	MOVX A, @DPTR	move data addressed by DPTR to accumulator
800E	F5F0		MOV B, A	move content from A to B register
8010	A3		INC DPTR	increment DPTR

Flow Chart



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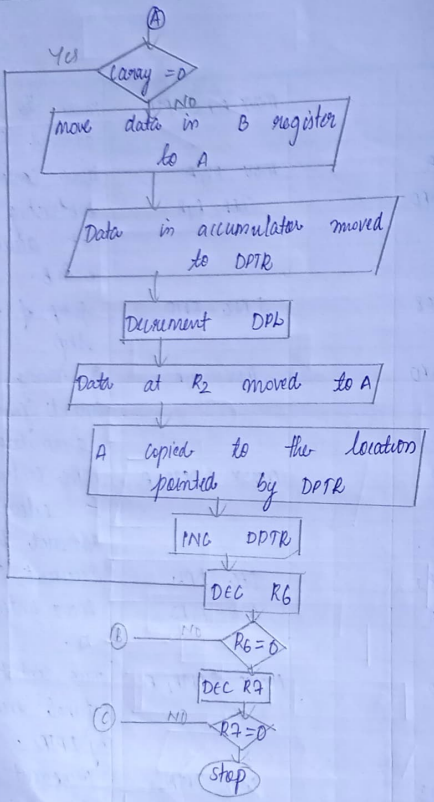
	8011	E0		MOVX A, @DPTR	move the content addressed by DPTR to A.
	8012	FA		MOV R2, A	move content from A to R2
	8013	95 F0		SUBB A, B	subtracting the content at accumulator with B.
	8015	5008		JNC SKIP	jump if no carry to skip.
	8017	E5 F0		MOV A, B	if having carry move content from B to accumulator.
	8019	F0		MOVX @DPTR, A	move content from A to external memory addressed by DPTR.
	801A	1582		DEC DPL	Decrement DPTR
	801C	EA		MOV A, R2	move content from R2 to A.
	801D	F0		MOVX @DPTR, A	move content from A to external memory addressed by DPTR.
	801E	A3		INC DPTR	increment DPTR.
	801F	DEEC	SKIP	DJNZ R6, LOOP	Decrement count at R6 and jump if non zero to loop
	8021	DFE5		DJNZ R7, LOOP1	decrement count at R7 and jump non zero to loop1.
	8023	80FE	HERE	SJMP HERE	End of the program



Observation

Input		Output	
9000H	: 05	9000H	: 01
9001H	: 04	9001H	: 02
9002H	: 03	9002H	: 03
9003H	: 02	9003H	: 04
9004H	: 01	9004H	: 05

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RESULT:

Sorted a given array of 8 bit number in ascending order stored in external RAM memory.

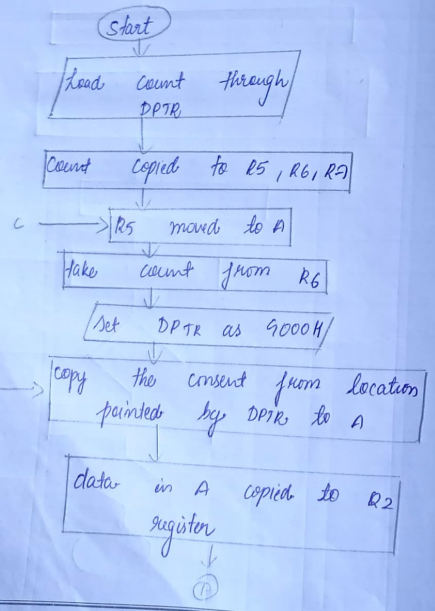
Problem specification

8666H : count = 05

data

9000H : 01
9001H : 02
9002H : 03
9003H : 04
9004H : 05

Flow chart



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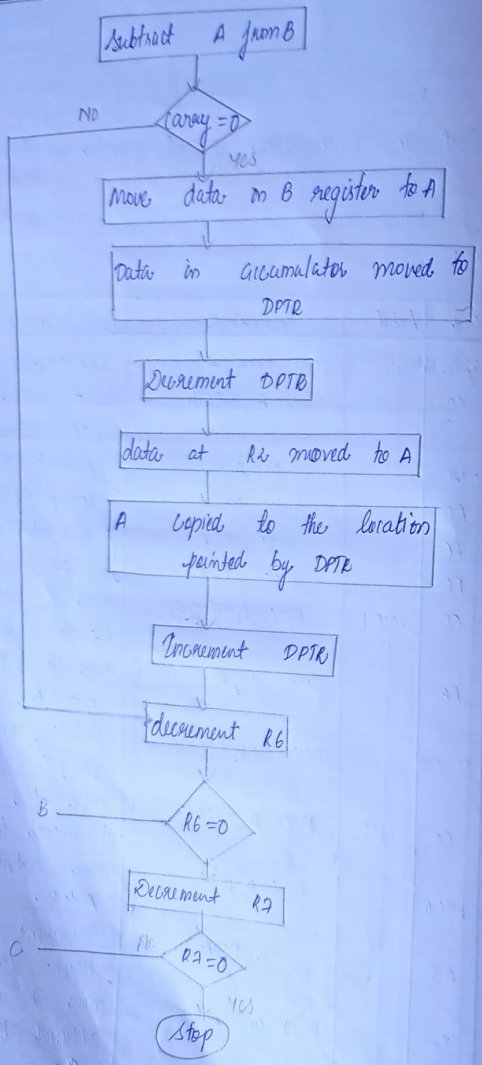
2) AIM:

Sort a given array of 8 bit number in descending order.

PROGRAM :

Memory	Hex	Label	Instructions	Comments
8000	90:86:66		MOV DPTR, #8666H	move DPTR to 8666H
8003	E0		MOVX A, @DPTR	count at 8666 addressed by DPTR moved to A.
8004	14		DEC A	decrement the count.
8006	FD		MOV R5, A	copying the count to 3 registers R5, R6, R7.
8006	FE		MOV R6, A	
8007	FF		MOV R7, A	
8008	ED	LOOP 1	MOV A, R5	move the content from R5 to accumulator.
8009	FE		MOV R6, A	moves the content from A to R6.
800A	90:90:00		MOV DPTR, #9000H	initialising DPTR to 9000H.
800D	E0	LOOP	MOVX A, @DPTR	Data address in DPTR is moved to accumulator.
800E	F5F0		MOV B, A	move content from A to B.
8010	A3		INC DPTR	Increment DPTR to reach 9001H.
8011	F0		MOVX A, @DPTR	move the content addressed by DPTR to A.



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	8012	FA		MOV R2, A	move content from A to R2.
	8013	95F0		A SUBB A, B	subtracting the content at accumulator with B.
	8015	4008		JC SKIP	jump if carry to skip.
	8017	F5F0		MOV A, B	if not having carry, move content from B to A.
	8019	F0		MOVX @ DPTR, A	move content from A to external memory addressed by DPTR.
	801A	1582		DEC DPL	Decrement DPTR.
	801C	EA		MOV A, R2	move content from R2 to A.
	801D	F0		MOVX @DPTR, A	move content from A to external memory addressed by DPTR.
	801E	A3		INC DPTR	Increment DPTR
	801F	DEEC	SKIP	DJNZ R6, SKIP LOOP	Decrement count at R6 and jump to loop if non zero to loop
	8021	DFE5		DJNZ R7, LOOP1	Decrement count at R7 and jump to loop1 if non zero.
	8023	80FE	HERE	SJMP HERE	End of the program.

Observation

Input		Output	
9000H	: 01	9000H	: 05
9001H	: 02	9001H	: 04
9002H	: 03	9002H	: 03
9003H	: 04	9003H	: 02
9004H	: 05	9004H	: 01

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RESULT :

Sorted a given array of 8 bit number in descending order stored in external ram memory.

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