

Special function Register of 8051 (SFRs of 8051)

8051 has 21, 8-bit special function registers.

<u>Name</u>	<u>Function</u>	<u>Byte add.</u>	<u>Bit add.</u>
A	Accumulator	0E0H	0E7H--0E0H
B	Arithmetic	0F0H	0F7H--0F0H
PSW	Program status word	0D0H	0D7H---0D0H
SP	Stack Pointer	81H	NA
DPL	Add. Ext. memory	82H	NA
DPH	Add. Ext. memory	83H	NA
P0*	I/O port latch	80H	87H--80H
P1*	"	90H	97H--90H
P2*	"	0A0H	0A7H--0A0H
P3*	"	0B0H	0B7H--0B0H
SCON	Serial port control	98H	9FH--98H
SBUF	Serial port Data Buffer	99H	NA
TCON	Timer/counter control	88H	8FH--88H
TMOD	Timer/counter mode Cont.	89H	NA
TLO	Timer 0 low byte	8AH	NA
TL1	Timer 0 low byte	8BH	NA
TH0	Timer 0 high byte	8CH	NA
TH1	Timer 1 high byte	8DH	NA
IE	Interrupt enable	0A8H	0AFH--0A8H
IP	Interrupt priority	0B8H	0BFH---0B8H
PCON	Power control	87H	NA.

- ✓ SFR are 8-bit register. Each SFR has its own special function
- ✓ They are placed inside MC
- ✓ As SFR are available to programmer, using them in instructions would ~~error~~

generate opcode. Therefore to avoid this SFR are allotted addresses.

Note: Lit. RAM (128 bytes \Rightarrow 00H - 7FH)

\therefore 80H - FFH = Addresses are completely unused & ^{can be freely} allotted to SFRs.

\therefore Therefore, SFRs are allotted addresses 80H - FFH

✓ Now, some SFRs are bit addressable, like P0, P1, P2, P3 - etc. All 8 bits can be individually accessed by instructions like SETB, CLR etc. This will
(SETB, P0.2)

again generates new opcodes. To avoid this even the bits of the SFRs are allotted addresses.

Again,

In bit addressable area, 00H - 7FH addresses are only occupied, keeping bit addresses 80H - FFH free to use by the programmer as SFRs bits.

Therefore, bit addresses 80H - FFH are allotted to the bits of various SFRs.

→ Port 0 has a byte add. of 80H & its bit add. are from 80H - 87H

NOTE: ① A byte operation at add. 80H will affect the entire Port 0

Eg: MOV A, P0 ; it will make all the contents of full P0 to A

② A bit operation at 80H will affect only P0.0

Eg: SETB P0.0 ; it will make P0.0 = 1.