Flags,Overflow, Shift , Rotate

Flags

- 8086 has 9 flag registers- status flags(6) and control flags(3)
- Status flags are

1. Carry flag (CF)
2. Parity flag (PF)
3. Overflow flag (OF)
4. Zero flag (ZF)
5. Sign flag(SF)
6. Auxiliary flag(AF)

Flags

Control flags are

1. Trace flag(TF)
2. Interrupt flag (IF)
3. Direction flag (DF)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
U	U	U	U	OF	DF	IF	TF	SF	ZF	CF	AF	U	PF	U	CF

Flags

Carry Flag – CF = 1 if there is a carry out from the msb on addition or there is a borrow into the msb on subtraction. CF is also affected by shift and rotate operations.

Parity Flag – PF = 1 if the low byte of a result has an even number of 1's (even parity).

Zero Flag – ZF = 1 if the result is zero.

Sign Flag – SF = 1 if the msb of a result is 1;

Overflow Flag – OF = 1 if signed overflow is occurred.

Auxiliary Flag – AF = 1 if there is a carryout from bit 3 on addition or a borrow into bit 3 on subtraction.

Flags for Logic Instructions

- SF,ZF,PF are updated after each logical instruction
- CF=0 and OF=0
- NOT doesnot affect any status flags

Shift Instruction

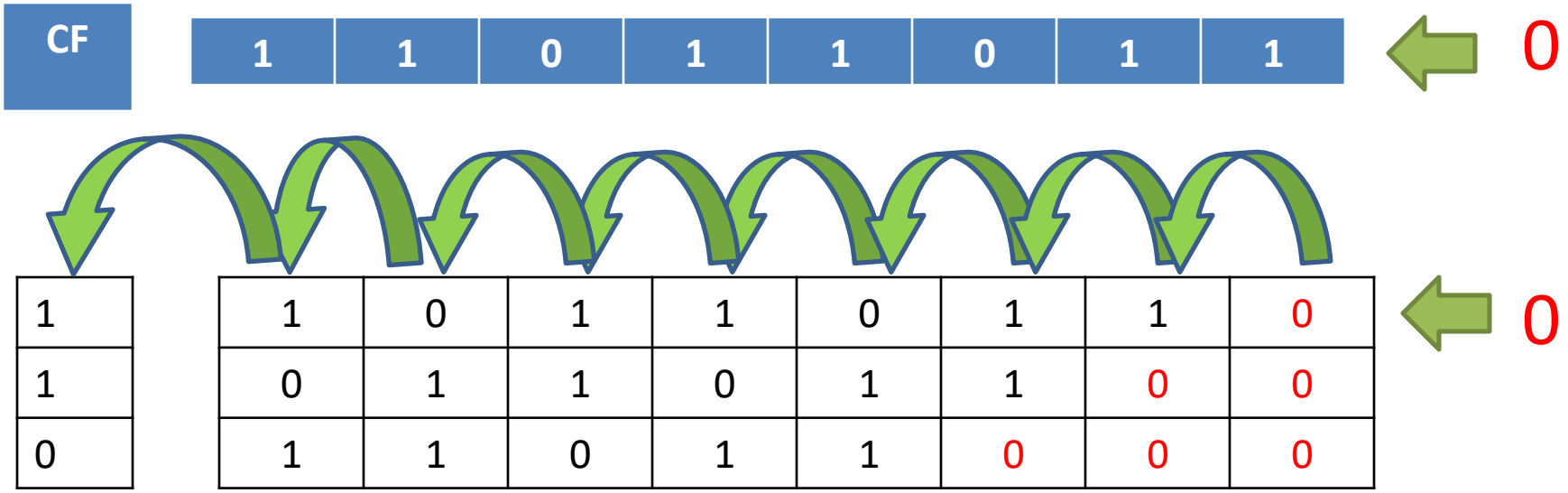
- Opcode destination, 1
- Opcode destination, CL ; cl>1
- Shifts destination bit pattern at specified direction
- Handy alternative of mul/div

CF=last bit shifted out

OF=1; if sign changes

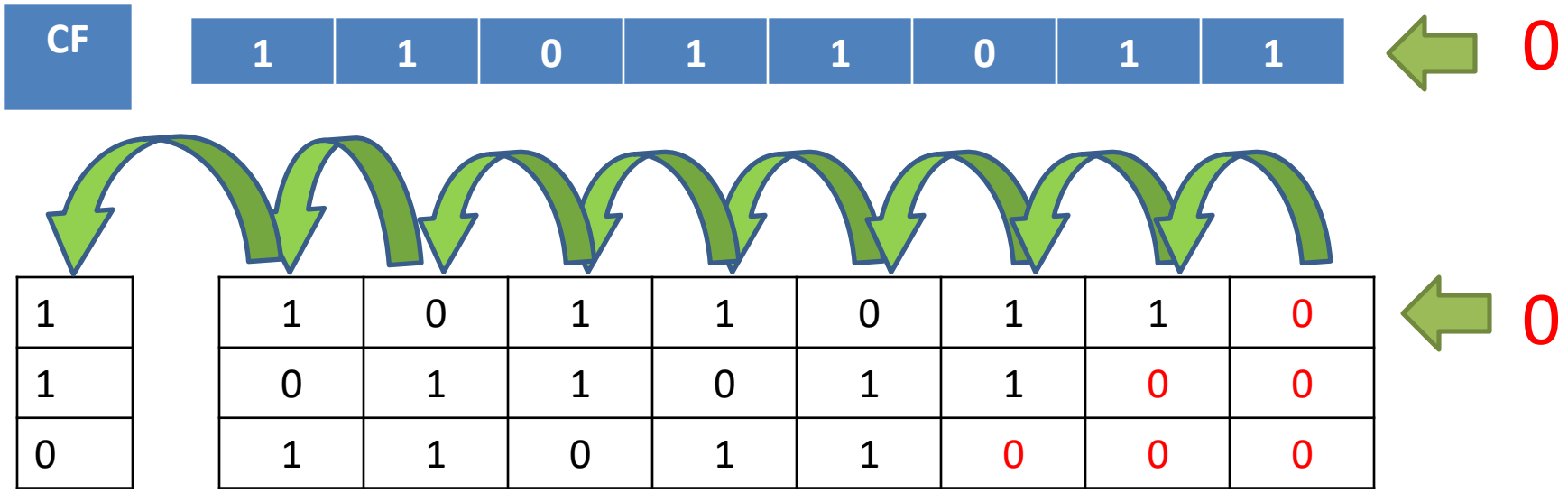
SHL

Shift Left



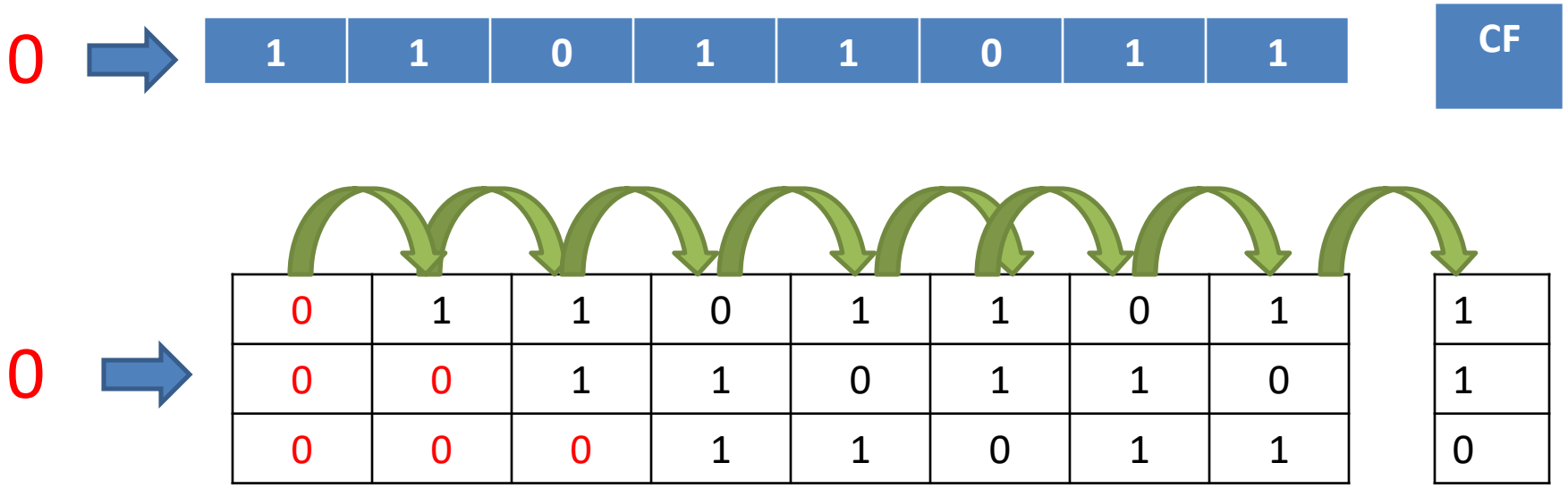
SAL

Shift Arithmetic Left



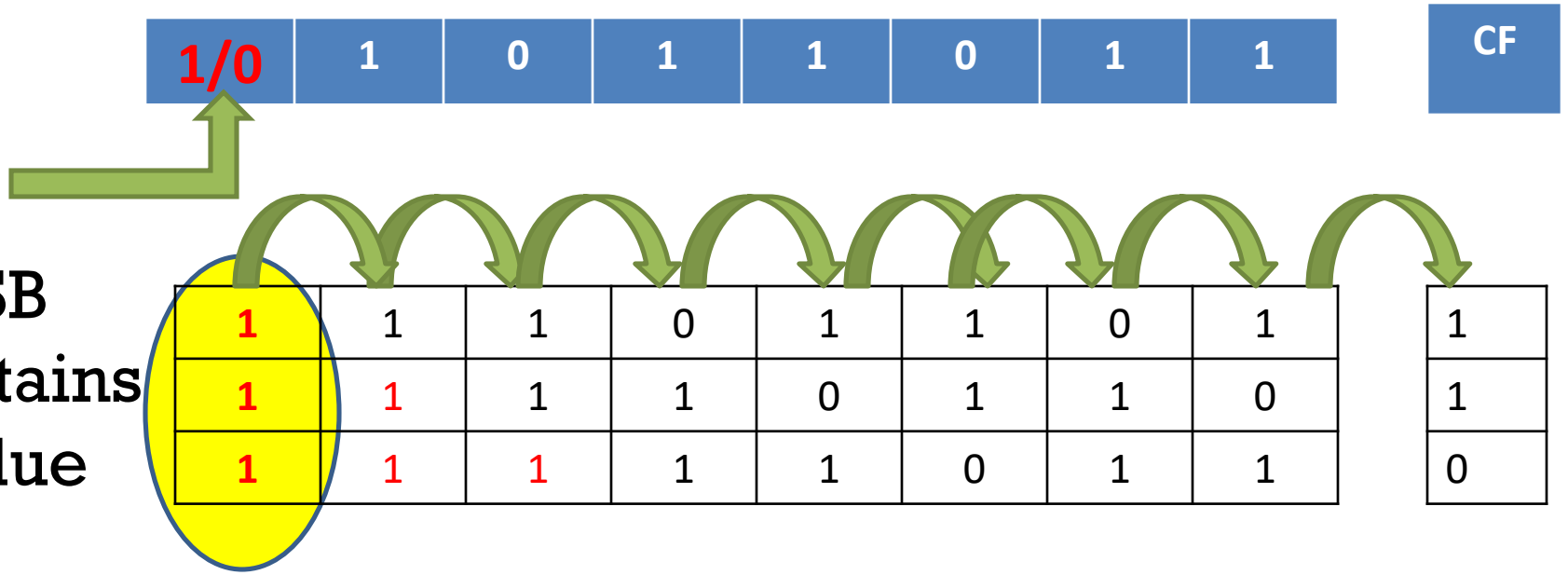
SHR

Shift Right



SAR

Shift Arithmetic Right



ROL

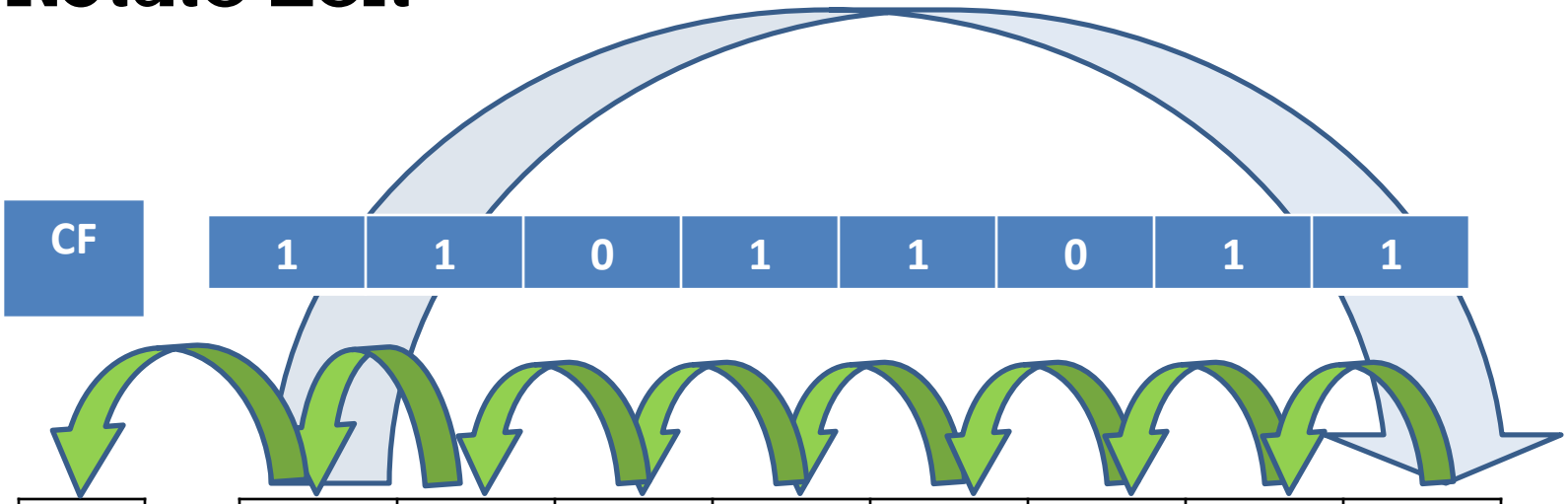
- Opcode destination, 1
- Opcode destination, CL ; cl>1
- Rotates destination bit pattern at specified direction

CF=last bit shiftet out

OF=1; if sign changes

ROL

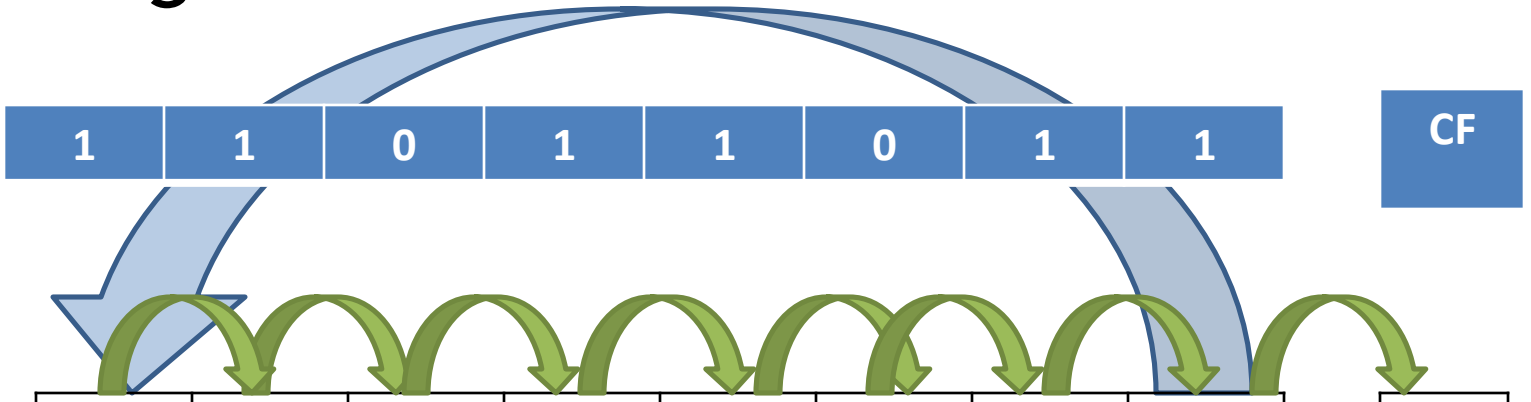
Rotate Left



1	1	0	1	1	0	1	1	1
1	0	1	1	0	1	1	1	1
0	1	1	0	1	1	1	1	0

ROR

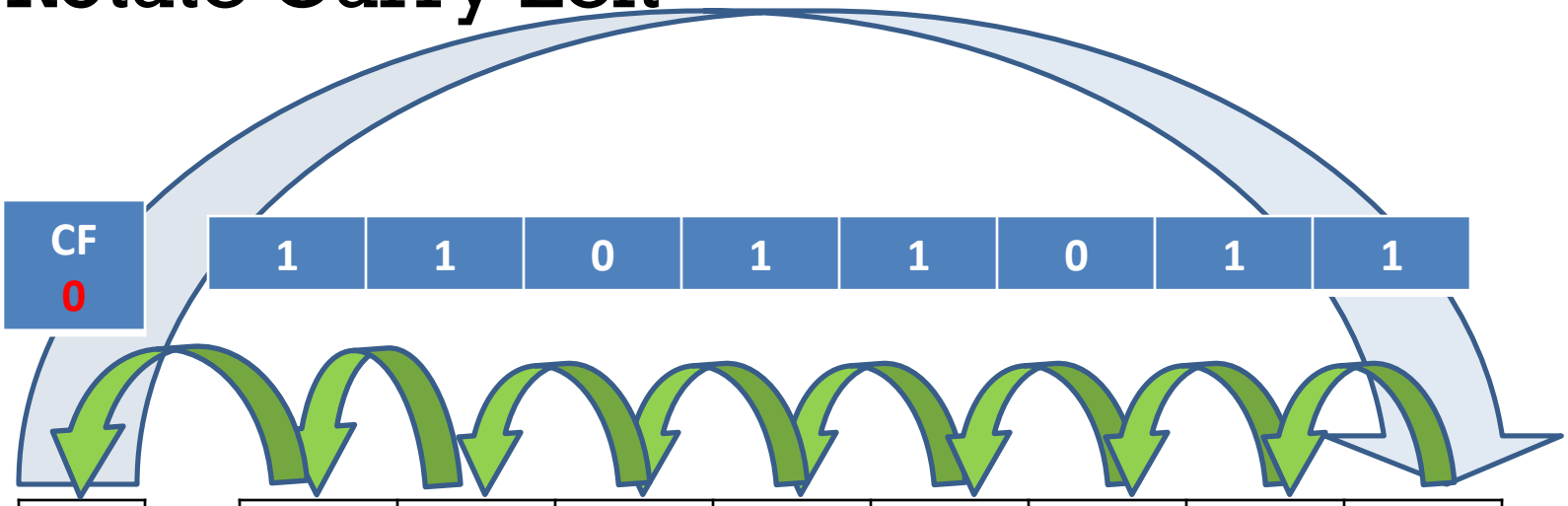
Rotate Right



1	1	1	0	1	1	0	1	1
1	1	1	1	0	1	1	0	1
0	1	1	1	1	0	1	1	0

RCL

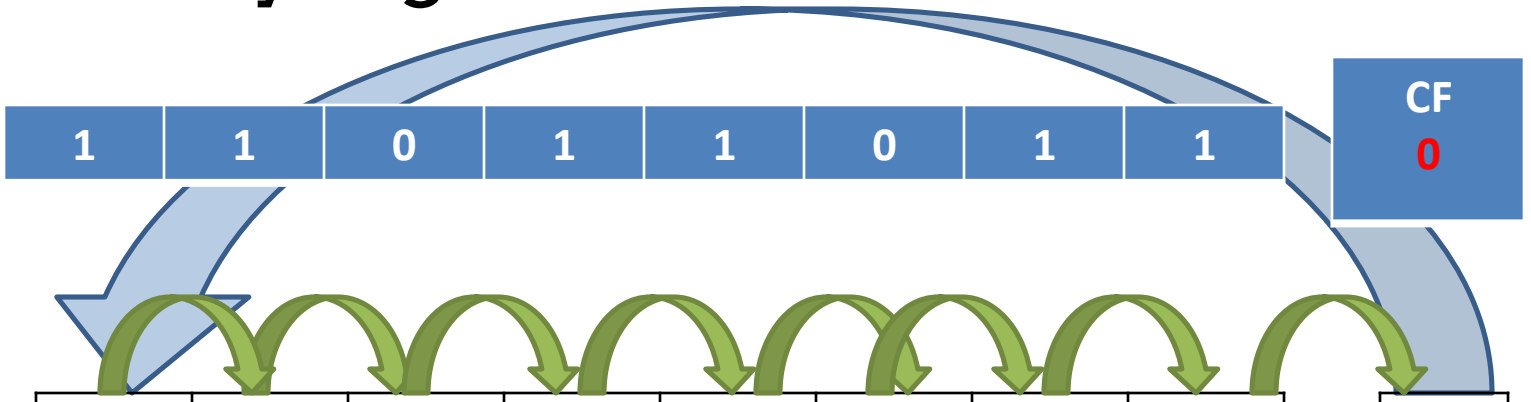
Rotate Carry Left



1	1	0	1	1	0	1	1	0
1	0	1	1	0	1	1	0	1
0	1	1	0	1	1	0	1	1

RCR

Rotate Carry Right



0	1	1	0	1	1	0	1	1
1	0	1	1	0	1	1	0	1
1	1	0	1	1	0	1	1	0