



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A’ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Sub: Microcontroller Programming And Interfacing

Subcode:23ECB202

Unit-III

PIC PROGRAMMING in C

Topic: Data Serialization in C

Introduction to Serializing Data

- Serializing data is a method of sending a byte one bit at a time.
- Two methods for serial data transfer:
 1. Using the Serial Port (Limited control over sequence).
 2. Bit-by-Bit Transfer (Full control, used in LCDs, ADCs, EEPROMs).
- Understanding C-based data serialization is crucial.



Serializing Data (LSB First - Shifting Right)

```
#include <P18F458.h>
#define PCO PORTCbits.RC0
void main(void) {
    unsigned char conbyte = 0x44, regALSB, x;
    regALSB = conbyte;
    TRISCbits.TRISC0 = 0;
    for(x = 0; x < 8; x++) {
        PCO = regALSB & 0x01;
        regALSB = regALSB >> 1;
    }
}
```



Serializing Data (MSB First - Shifting Left

```
#include <P18F458.h>
#define PCO PORTCbits.RC0
void main(void) {
    unsigned char conbyte = 0x88, regAMSB, x;
    regAMSB = conbyte;
    TRISCbits.TRISC0 = 0;
    for(x = 0; x < 8; x++) {
        PCO = (regAMSB >> 7) & 0x01;
        regAMSB = regAMSB << 1;
    }
}
```



Receiving Serial Data (LSB First - Shifting Right)

```
#include <P18F458.h>
#define PB0 PORTBbits.RB0
void main(void) {
    unsigned char x, REGA = 0;
    TRISBbits.TRISB0 = 1;
    TRISD = 0;
    for(x = 0; x < 8; x++) {
        REGA = REGA >> 1;
        REGA |= (PB0 & 0x01) << 7;
    }
    PORTD = REGA;
}
```

Conclusion

- Serial data transfer is essential in microcontrollers.
- Two methods:
 1. Shifting Right (LSB First)
 2. Shifting Left (MSB First)
- Understanding C-based bitwise operations helps in efficient serial communication.