PIC12F629 / 675
Programming PIC in C Part II
Inline Assembler
EEPROM

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Inline Assembler

- Two variants:

```
unsigned int var;
#asm
bcf 0,3
rlf _var
rlf _var+1
#endasm
```

```
// or like this
asm("bcf 0,3");
asm("rlf _var");
asm("rlf _var+1");
```

- A #asm block can't be used within any C constructs such as if, while, do...

Timing Functions

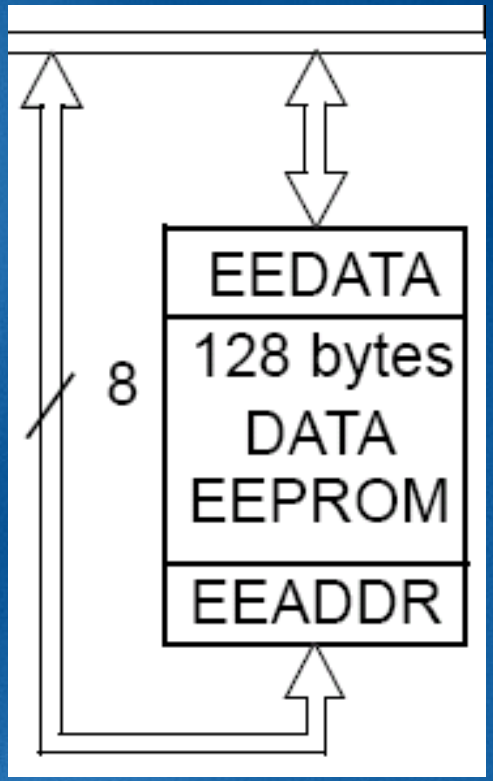
Frequency of oscillator must be defined:
#define _XTAL_FREQ 4000000

Two functions:

- __delay_ms(x) // request a delay in milliseconds
- __delay_us(x) // request a delay in microseconds

Package

Device	Program Memory	Data Memory		I/O	10-bit A/D (ch)	Comparators	Timers 8/16-bit
	FLASH (words)	SRAM (bytes)	EEPROM (bytes)				
PIC12F629	1024	64	128	6	–	1	1/1
PIC12F675	1024	64	128	6	4	1	1/1



EEPROM - basics

- Readable and writable during normal voltage,
- memory is not directly accessible, it's mapped in the register file space,
- direct access via C functions:
  - eeprom_write()
  - eeprom_read()
- address range from 0h to 7Fh
- interrupt on write complete (EEIF)

Functions for Accessing EEPROM I

- eeprom_write() initiates process of writing to the EEPROM memory and returns when write is completed
- new data in EEPROM are valid approx. 4ms later (= 4000 instruction cycles!)
- but next read/write operation waits until previous one is finished

Functions for Accessing EEPROM II

```
#include <htc.h>
void eetest(void){
unsigned char value = 1;
unsigned char address = 0;
eeprom_write(address,value);
// Initiate writing value to address
value = eeprom_read(address);
// read from EEPROM at address
}
```

EEPROM Registers

TABLE 8-1: REGISTERS/BITS ASSOCIATED WITH DATA EEPROM

Address	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Value on POR, BOD	Value on all other RESETS
0Ch	PIR1	EEIF	ADIF	—	—	CMIF	—	—	TMR1IF	00-- 0--0	00-- 0--0
9Ah	EEDATA	EEPROM Data Register								0000 0000	0000 0000
9Bh	EEADR	—	EEPROM Address Register							-000 0000	-000 0000
9Ch	EECON1	—	—	—	—	WRERR	WREN	WR	RD	---- x000	---- q000
9Dh	EECON2(1)	EEPROM Control Register 2								---- ----	---- ----

Legend: x = unknown, u = unchanged, - = unimplemented read as '0', q = value depends upon condition.
Shaded cells are not used by Data EEPROM module.

Note 1: EECON2 is not a physical register.