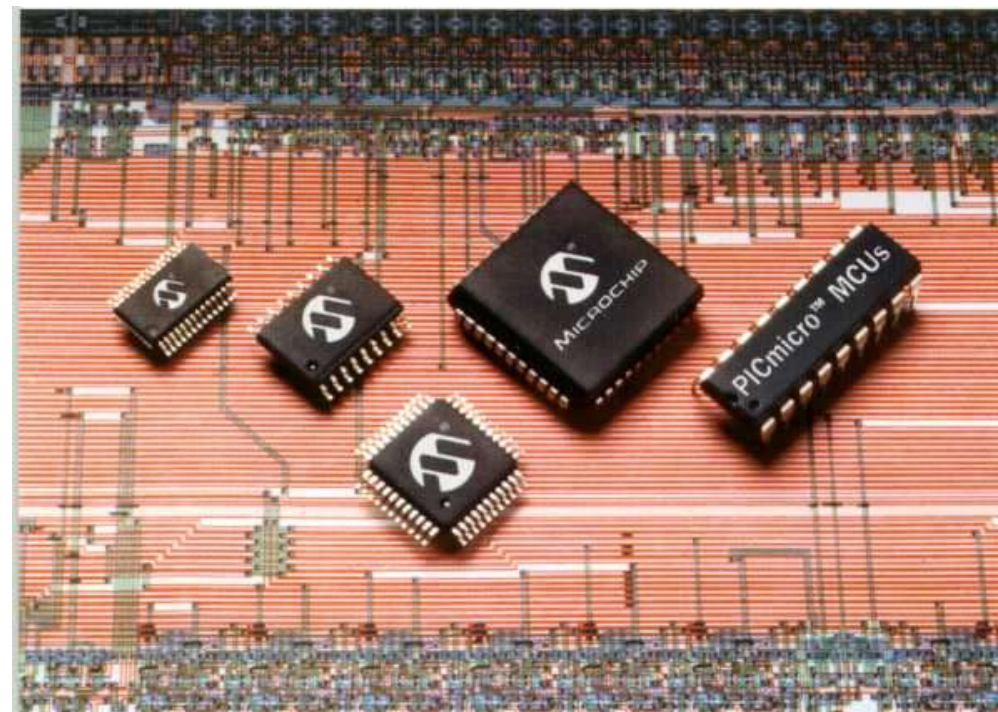# ENGINE

TEACHING ONLINE ELECTRONICS, MICROCONTROLLERS AND PROGRAMMING IN HIGHER EDUCATION

Erasmus+

Module_2-1. Pins as outputs

Περιεχόμενα
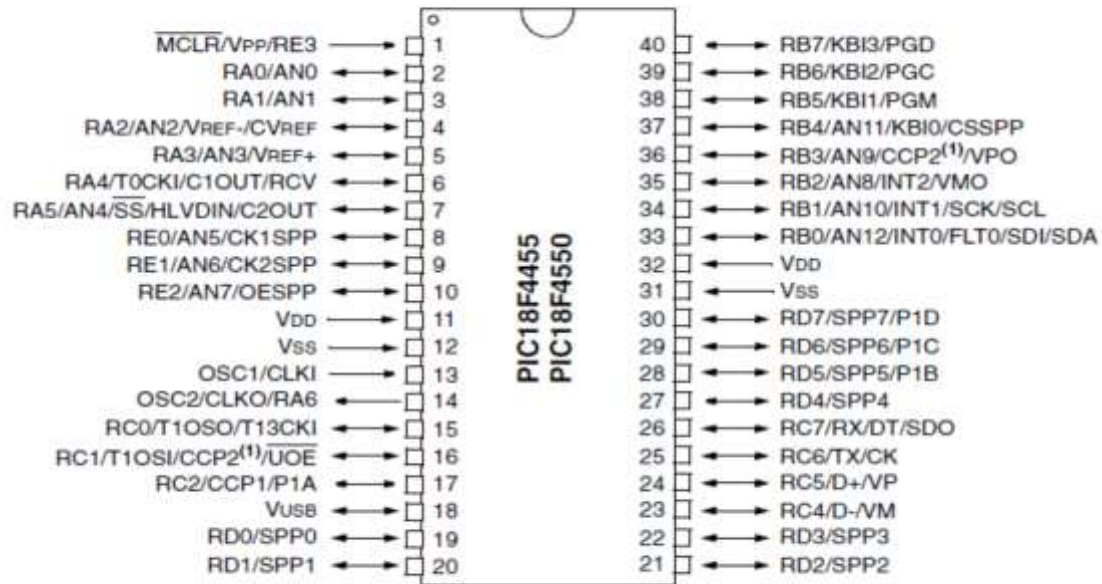
- Εισαγωγή

- Παράδειγμα

PIC18F4550

40-Pin PDIP

$\overline{MCLR}$/VPP/RE3	1	40	RB7/KBI3/PGD
RA0/AN0	2	39	RB6/KBI2/PGC
RA1/AN1	3	38	RB5/KBI1/PGM
RA2/AN2/VREF-/CVREF	4	37	RB4/AN11/KBI0/CSSPP
RA3/AN3/VREF+	5	36	RB3/AN9/CCP2(1)/VPO
RA4/T0CKI/C1OUT/RCV	6	35	RB2/AN8/INT2/VMO
RA5/AN4/$\overline{SS}$/HLVDIN/C2OUT	7	34	RB1/AN10/INT1/SCK/SCL
RE0/AN5/CK1SPP	8	33	RB0/AN12/INT0/FLT0/SDI/SDA
RE1/AN6/CK2SPP	9	32	VDD
RE2/AN7/OESPP	10	31	VSS
VDD	11	30	RD7/SPP7/P1D
VSS	12	29	RD6/SPP6/P1C
OSC1/CLKI	13	28	RD5/SPP5/P1B
OSC2/CLKO/RA6	14	27	RD4/SPP4
RC0/T1OSO/T13CKI	15	26	RC7/RX/DT/SDO
RC1/T1OSI/CCP2(1)/UOE	16	25	RC6/TX/CK
RC2/CCP1/P1A	17	24	RC5/D+/VP
VUSB	18	23	RC4/D-/VM
RD0/SPP0	19	22	RD3/SPP3
RD1/SPP1	20	21	RD2/SPP2

PIC18F4455
PIC18F4550

MICROCHIP
PIC18F4450

Direction / Data register

PORTB Direction Register

PORTB Direction Register, TRISB, Special Function Register
Στην διεύθυνση F93h.

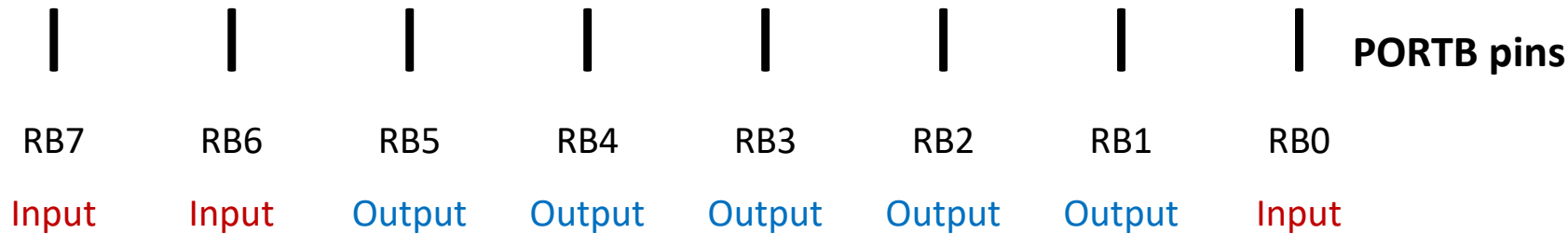| 1	1	0	0	0	0	0	1

PORTB Data Register

PORTB Data Register, PORTB, Special Function Register
Στην διεύθυνση F81h.

PORTB pins

RB7	RB6	RB5	RB4	RB3	RB2	RB1	RB0
Input	Input	Output	Output	Output	Output	Output	Input

Special Function Registers

F97h	—
F96h	TRISE[3]
F95h	TRISD[3]
F94h	TRISC
F93h	TRISB
F92h	TRISA
F91h	—[2]

F85h	—[2]
F84h	PORTE
F83h	PORTD[3]
F82h	PORTC
F81h	PORTB
F80h	PORTA

Οι τιμές στον TRISB καθορίζουν ποια pins της PORTB θα είναι είσοδοι και ποια έξοδοι.
1 → PORTB input.
0 → PORTB output.

set_tris_b(0xF0);

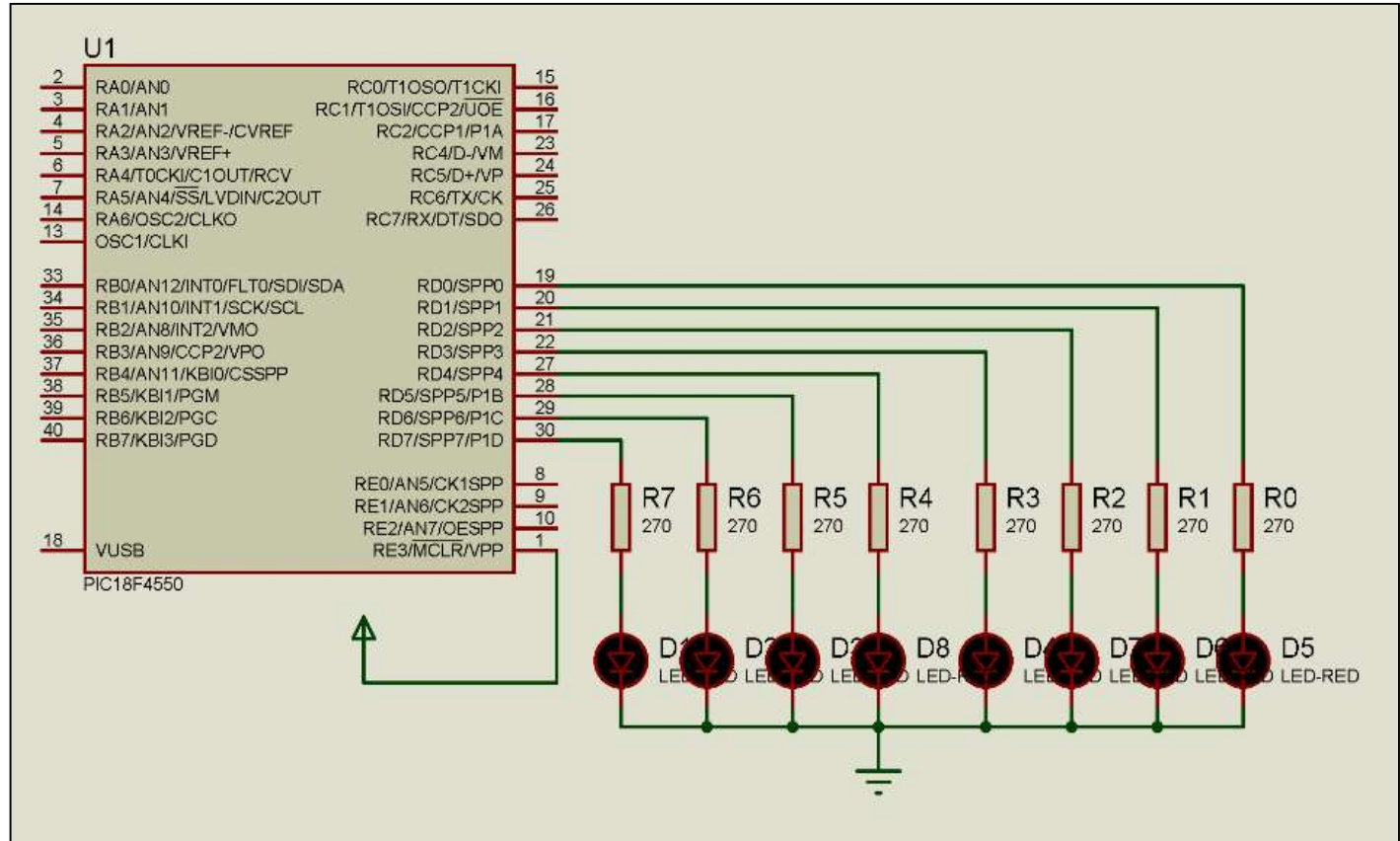**set_tris_b(0b11110000);**

ON/OFF LEDs κάθε 200 ms

```
#include <main.h>
#byte PORTD =0xF83 // F83h θέση μνήμης της PORTD

void main(void){

set_tris_d(0x00);  // η PORTD ορίζεται ως έξοδος

PORTD =0b11111111;   //η PORTD παίρνει την τιμή 1111 1111

   while(TRUE) {                    // για πάντα
          delay_ms(100);          //περίμενε 100 ms
          PORTD=0b00000000;    // σβήσε τα 8 LEDs
          delay_ms(100);          //περίμενε 100 ms
          PORTD=0b11111111;   //άναψε τα 8 LEDs
        }
   }
```

ENGINE Partnership

- Warsaw University of Technology (PL) - *coordinator*

- IHU - International Hellenic University (GR)

- EDUMOTIVA - European Lab for Educational Technology (GR)

- University of Padova (IT)

- University of Applied Sciences in Tarnow (PL)

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