// PROJECT  :Blink

// PURPOSE  :(First) Demonstration of inline assembly code

// DEVICE   :Arduino

// AUTHOR   :C. D'Arcy

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// uC       :328

// COURSE   :ICS4U

// STATUS   :Working

// REFERENCE:http://darcy.rsgc.on.ca/ACES/Datasheets/InstructionSetSummary.pdf

void setup() {

  Serial.begin(9600);

  asm (

    "ldi  r16,0b00100000       \n"     //prepare to declare PB5 for output

    "out  0x04,r16             \n"     //set it: pinMode(13,OUTPUT);

    "out  0x05,r16             \n"     //reuse r16: digitalWrite(13,HIGH);

    "ldi  r17,0b00100000       \n"     //prepare the (xor) mask for bit 5

  );

  Serial.println(DDRB, HEX);          //Confirmation

  Serial.println(PORTB, HEX);         //Confirmation

}

void loop() {

  asm("eor  r16,r17           \n"     //apply the toggle: r16 <- r16^r17

    "out  0x05,r16          \n"     //flip the bit

    "rcall  delay1s         \n"

    "rjmp cya               \n"

  "delay1s:   ldi  r18, 82\n"

      "    ldi  r19, 43\n"

      "    ldi  r20, 0\n"

      "1:  dec  r20"  "\n"

      "    brne 1b" "\n"

      "    dec  r19"  "\n"

      "    brne 1b" "\n"

      "    dec  r18"  "\n"

      "    brne 1b" "\n"

      "    lpm  \n"

      "    nop  \n"

      "   ret     \n"

    "cya: \n"

     );

}