

Open AVR Edit

Set up the program by going to Setup(S) -> Environment Options... -> Compiler -> ROM or HEX create options and choose “.HEX create” and in MCU Type choose “at90s2313”.

Program 1

- Type in the following program

```
//Get information about the AT90S2313 including addresses of input and output ports
//Comments start with //
#include <avr/io.h>

//main is the name of the subroutine that is run when you start the program
int main(void){

//Set up port B as output port, 0x at the start of a number indicates it is in hex
//all statements end with a ;
outp(0xff,DDRB);

//Send 08H to the output port B
outp(0x08,PORTB);

//Finish the program by returning a zero (no error)
return 0;
}
```

Save the program

Run and compile using



The program needs to be loaded into the chip. To program the chip on the STK200 using the AVR ISP program. Start the program and set up by choosing the AT90S2313 then Device -> Auto Program Options ... and tick Reload Files, Erase Device, Program & Verify Flash Memory, Run

Go to File -> Load ... -> Flash and choose the hex version of the file

Make sure the STK200 is plugged in and turned on and then choose Device -> Auto Program.

Program 2

Make the middle two middle LEDs light

Program 3

- Try the following program

```
//Get information about the AT90S2313 including addresses of input and output ports
#include <avr/io.h>

//subroutine to waste time by counting to 10000000
void wastetime(void){
long t;
for(t=0;t<10000000;t++);
}

int main(void){
outp(0xff,DDRB);

//start an endless loop
while(1==1){
//Send 08H to the output port B
outp(0x08,PORTB);
wastetime();
//Send 04H to the output port B
outp(0x04,PORTB);
wastetime();
}

//Finish the program
return 0;
}
```

Program 4

- Change the program to make one LED flash