

## ***To Make The Robot BEEP – Your First C Program***

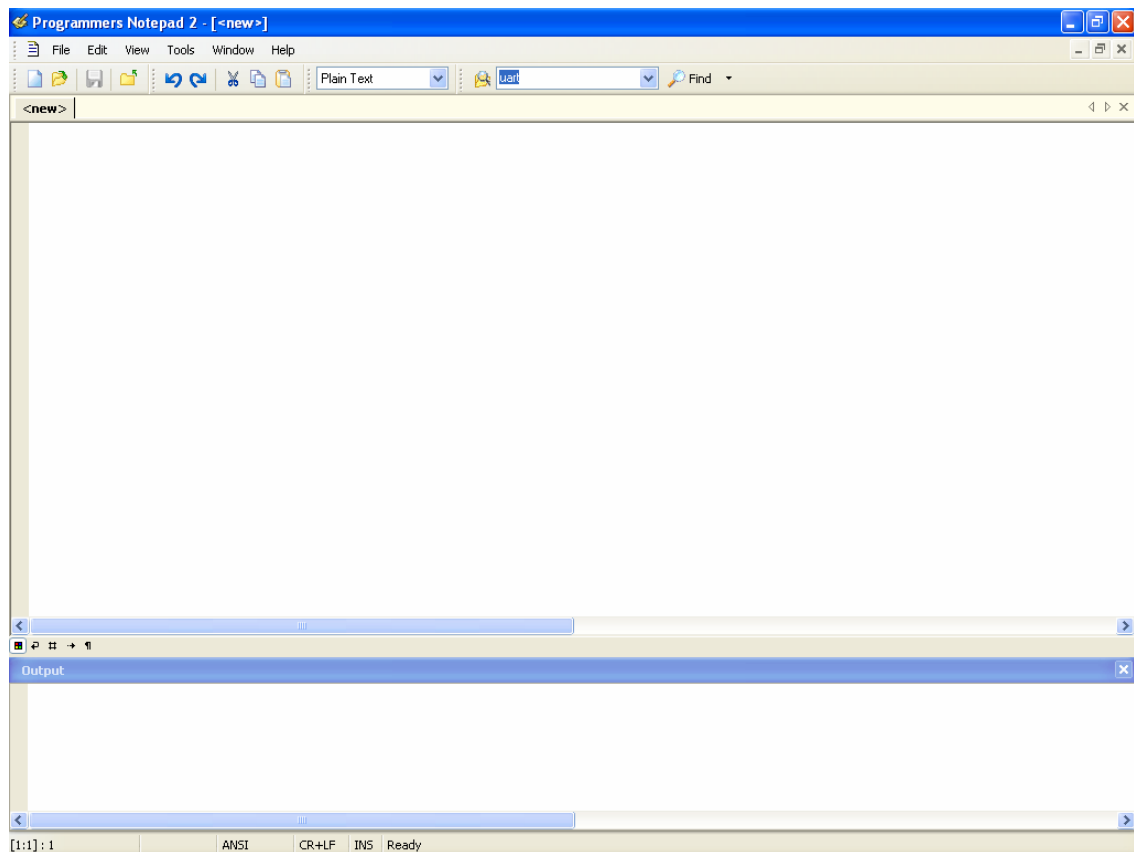
### **Initial Steps**

- Make a directory called RoboBEEP for this project.
- Copy ‘.../WinAVR/Samples/makefile’ (notice that it has no extension) to the RoboBEEP directory.

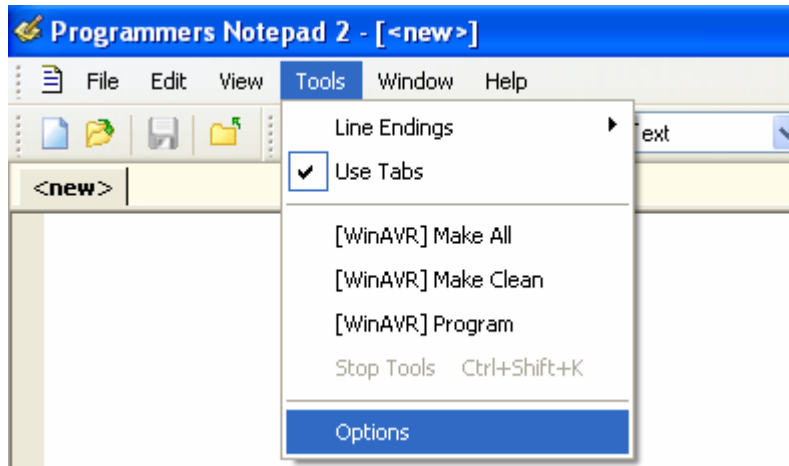
### **Write it in Programmers Notepad**



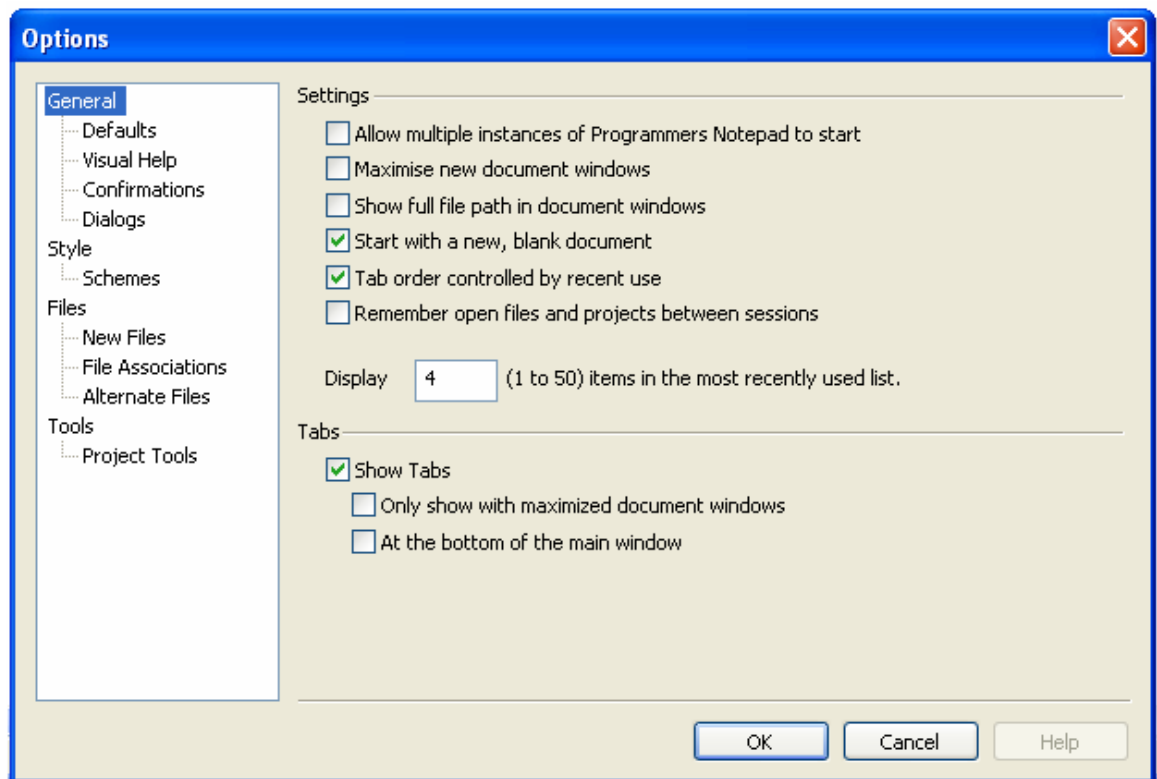
- Find Programmers Notepad that was installed as part of WinAVR (you should have an icon for it on your desktop) and open it.



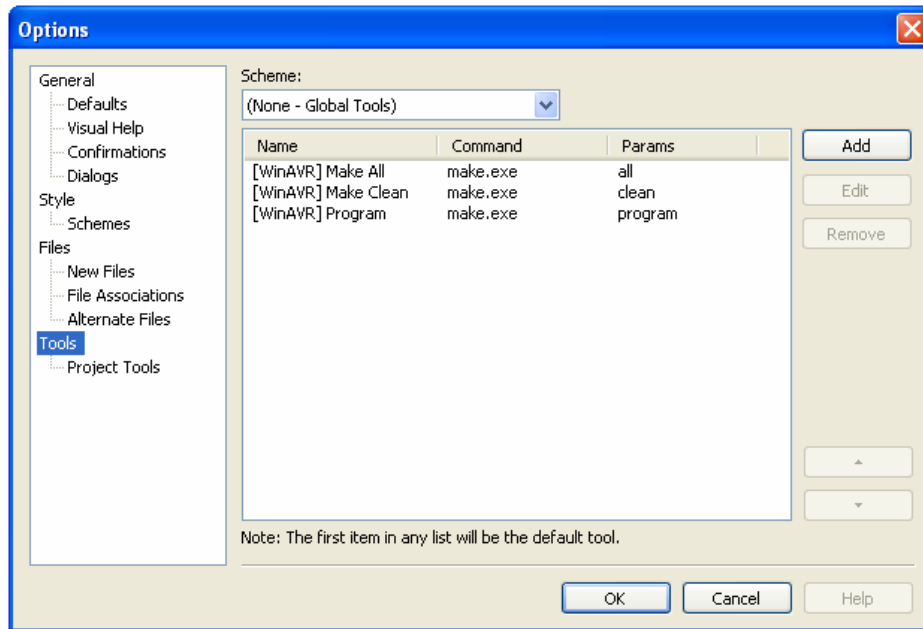
- Open the Tools menu and click on Options.



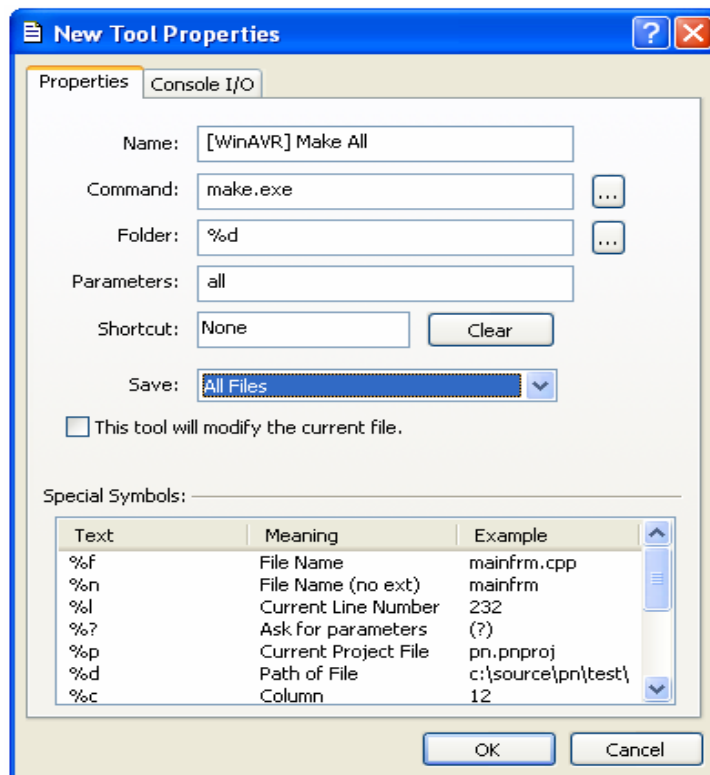
- In the Options window select Tools.

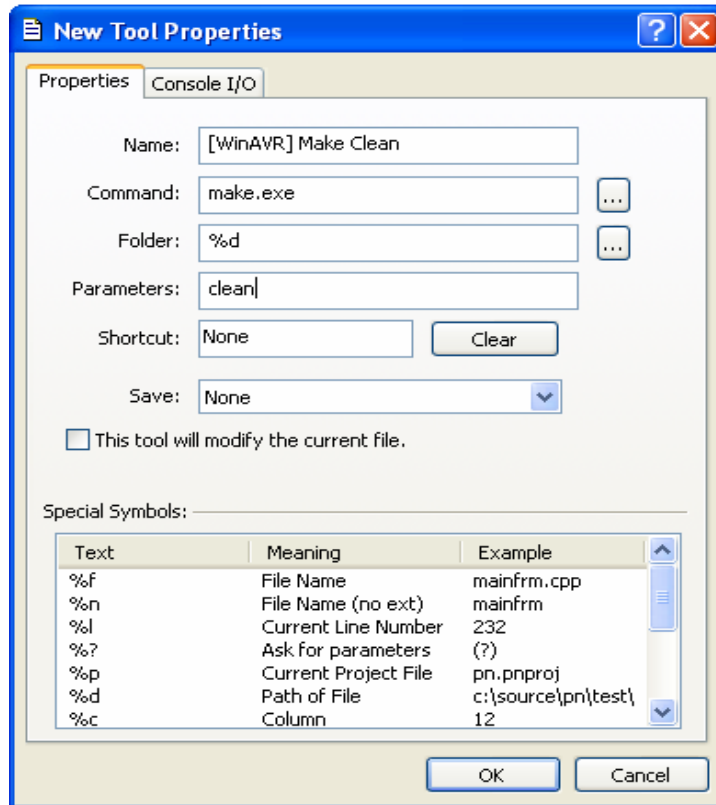


- Then select Add.



- You need to Add: Make All, Make Clean (Ignore the Make Program that you see in above screenshot). The screenshots of these two are shown below (In both the case, you don't have to do anything in "Console I/O tab, default settings are OK):





- Open a new file and name it RoboBeep.c and type (copy paste ☺) the following code:

```
#include <avr/io.h>
#include <avr/delay.h>

int main (void)
{
    unsigned char counter;

    //set PORTB for output
    DDRB = 0xFF;
    while (1)
    {
        //set PORTB.7 high
        PORTB |= 1<<7;
        //wait (10 * 120000) cycles = wait 1200000 cycles
        counter = 0;
        while (counter != 5)
        {
            //wait (30000 x 4) cycles = wait 120000 cycles
            _delay_loop_2(30000);
            counter++;
        }
    }
}
```

```
    }
    //set PORTB.7 low
    PORTB &= ~(1<<7);
    //wait (10 * 120000) cycles = wait 1200000 cycles
    counter = 0;
    while (counter != 5)
    {
        //wait (30000 x 4) cycles = wait 120000 cycles
        _delay_loop_2(30000);
        counter++;
    }
}
return 1;
}
```

- Save it to RoboBeep directory
- Copy 'Makefile' from ...\\WinAVR\\sample directory to RoboBeep directory
- Open the 'Makefile' from RoboBeep directory and set/edit following parameters:

```
MCU = atmega128

F_CPU = 11059200

FORMAT = ihex

TARGET = RoboBeep

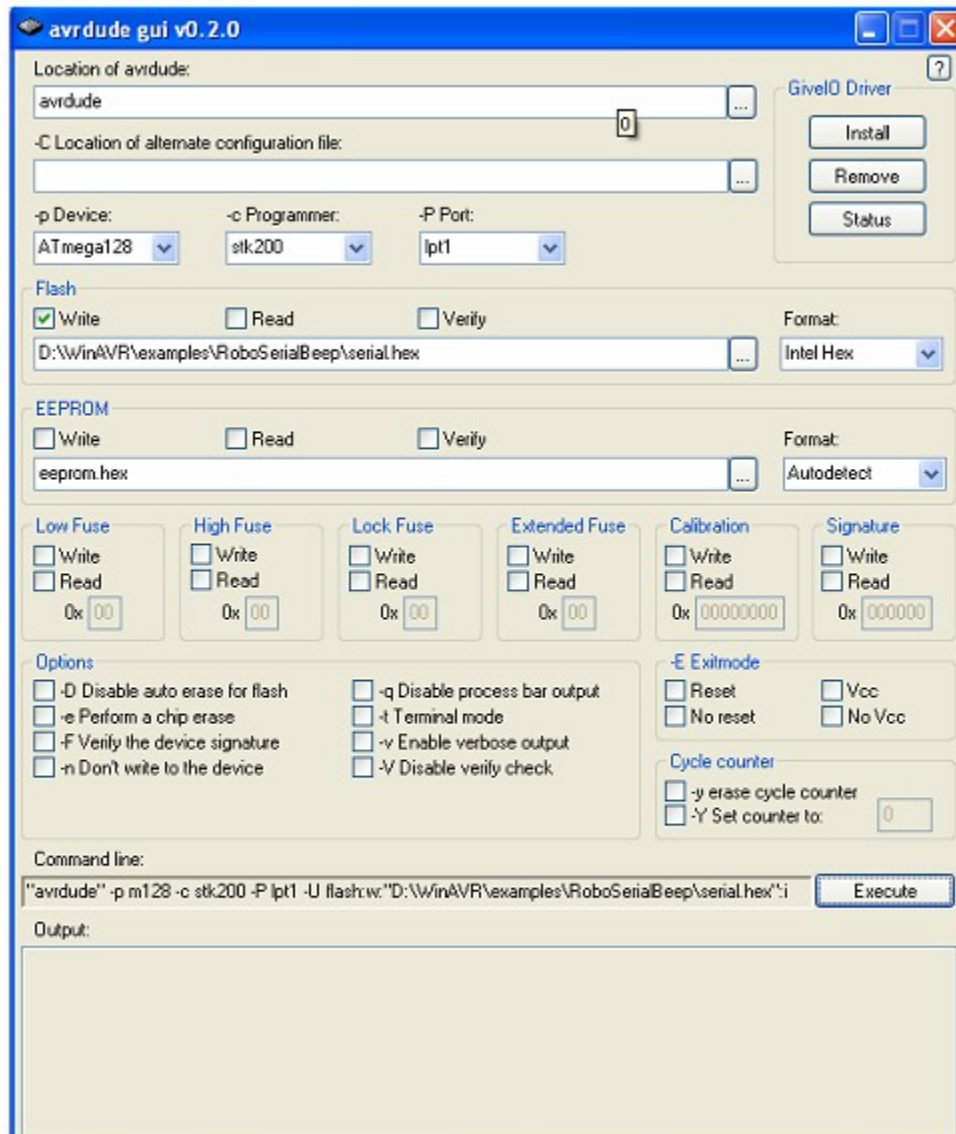
SRC = $(TARGET).c

#CPPSRC = main.cpp (Note: COMMENT this line)
```

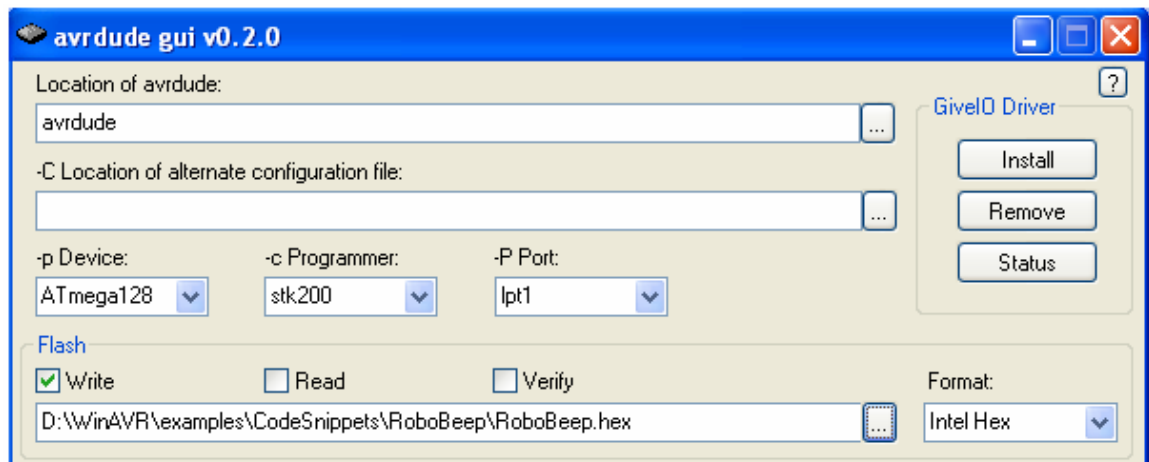
- Close and save changes to 'Makefile' to the RoboBeep directory.
- Open Tools and click [WinAVR] Make All which performs the job of compiling, linking and creating couple of load files in RoboBeep directory of which '**RoboBeep.hex**' file is the one you should be looking for.

## Download to the Robot

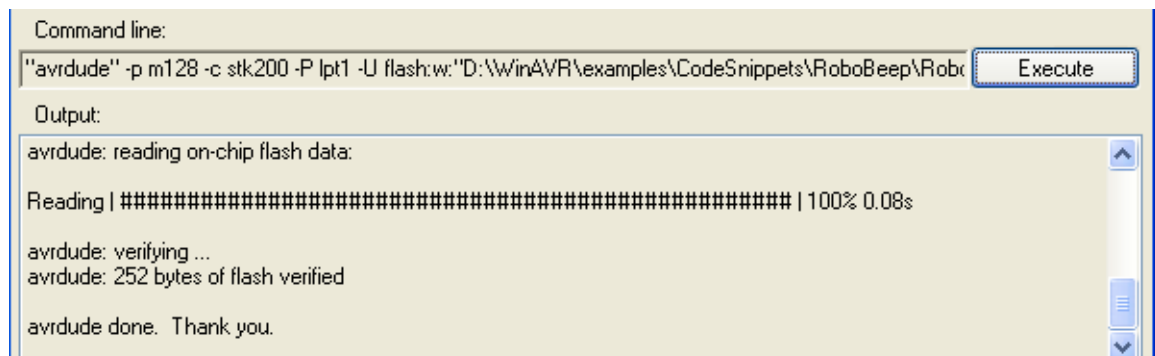
- Use **avrdude-gui** (a simple GUI for **avrdude** which is a command line tool to program the Atmel AVR Microcontrollers) to download your .hex file to the Robot.
- Type **avrdude-gui** on the DOS command line and a GUI interface pops up whose screenshot is shown below:



- Press **Install** button under '**GiveIO Driver**' box (located on top right corner)
- Set following options/parameters in the GUI interface as shown below:
  - ✓ Select ATmega128 for -p device
  - ✓ Select stk200 for -c Programmer
  - ✓ Select lpt1 for -P Port
  - ✓ Check 'Write' box under 'Flash'
  - ✓ Provide full path of 'Robobeep.hex' file
  - ✓ Select 'Intel Hex' in the Format



- Press 'Execute' button (without changing anything in the 'Command line' textbox to download the code.
- If you have promptly followed above directions, you must see the following message in the 'Output' box:



- If you are not seeing the above message you have goofed up!!
- Disconnect the cable and switch on the robot
- THAT'S IT 😊

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