**Uploading firmware to atmega 328p microcontroller found on Arduino**

Purpose: This tutorial will teach you to integrate Arduino code into a complete C++ project using the Atmel Studio 7 integrated development environment.

1. Download and install AtmelStudio 7
2. Download and install Arduino IDE version 1.8.2 or newer version
3. Open Arduino IDE and open sketch of choice
4. Open your Atmel Studio 7 app — Connect your Arduino on usb;
5. File > New > Project and hit ‘Create new project from Arduino sketch’
6. Choose a name, browse the file location of your project, creating a project folder
7. Configure ‘Sketch File’= your file sketch file location, Arduino IDE Path=your Arduino IDE (for example, C:\Arduino), ‘Board’= Arduino/Genuino Uno, ‘Device’ = atmega328P and hit ‘Ok’
8. You will be presented with the code
9. Press Build > Build solution and output will show:

‘Build succeeded.

== Build: 2 succeeded or up-to-date, 0 failed, 0 skipped ===’ ;

13. To upload code to board: hit ‘Tools’ > ‘External Tools’;

14 . Configure it like this:

Title: ’Arduino Firmware Upload’

Commands: click ‘…’ and navigate to your arduino installation: C:\arduino\hardware\tools\avr\bin\avrdude.exe and hit ‘open’;

Arguments: For this you will need to load your sketch via Arduino IDE normally using the ‘Preferences’ setting by choosing ‘Show verbose output during’: ‘upload’;

15 . Go to to Arduino IDE and in a normal compilation output you’ll see:

Sketch uses 928 bytes (2%) of program storage space. Maximum is 32256 bytes.

Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes for local variables. Maximum is 2048 bytes.

C:\arduino\hardware\tools\avr/bin/avrdude -CC:\arduino\hardware\tools\avr/etc/avrdude.conf -v -patmega328p -carduino -PCOM3 -b115200 -D -Uflash:w:C:\Users\giljr\AppData\Local\Temp\arduino\_build\_666279/\_26\_arduSerie\_atmelStudio\_00.ino.ino.hex:i

16 . Copy that piece of code to ‘Arguments’:

-CC:\arduino\hardware\tools\avr/etc/avrdude.conf -v -patmega328p -carduino -PCOM3 -b115200 -D -Uflash:w:

17. Complete it with:

"$(ProjectDir)Debug\$(TargetName).hex":i

so the result will be:

-CC:\arduino\hardware\tools\avr/etc/avrdude.conf -v -patmega328p -carduino -PCOM3 -b115200 -D -Uflash:w:”$(ProjectDir)Debug\$(TargetName).hex”:i

18. Select ‘Use Output window’ and hit ‘Ok’;

19. Press ‘Tools > Arduino Firmware Upload’’ and the code must be uploaded to your Arduino and now onboard led must be blinking;

you’ll see on Output:

avrdude.exe done. Thank you.