JUST DO IT

interst = deep learning | linux | etc.

☰ Menu

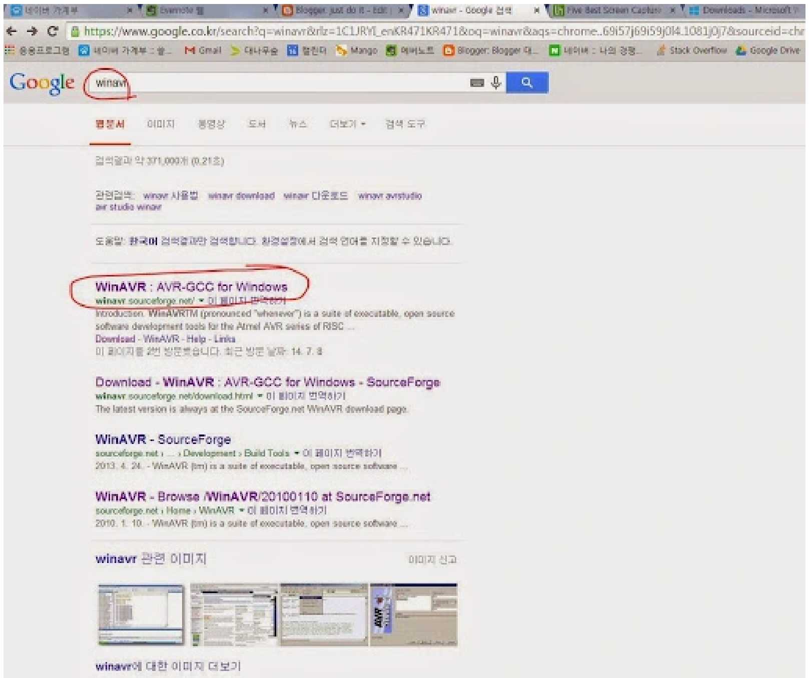
installing and compiling with WinAVR in Windows(+a simple avr compiling&uploading example/tutorial)

mainuser AVR 2014-07-212014-09-21 5 Minutes

Table of Contents:

1) installing WinAVR

just follow the screen captures (click the images to zoom in)



winavr

검색결과 약 371,000개 (0.21초)

관련검색: winavr 사용법 winavr download winavr 다운로드 winavr avrstudio avr studio winavr

WinAVR : AVR-GCC for Windows
winavr.sourceforge.net/ ▾ 이 페이지 번역하기
Introduction. WinAVRTM (pronounced "whenever") is a suite of executable, open source software development tools for the Atmel AVR series of RISC ...
Download - WinAVR - Help - Links
이 페이지를 2번 방문했습니다. 최근 방문 날짜: 14. 7. 8

Download - WinAVR : AVR-GCC for Windows - SourceForge
winavr.sourceforge.net/download.html ▾ 이 페이지 번역하기
The latest version is always at the SourceForge.net WinAVR download page.

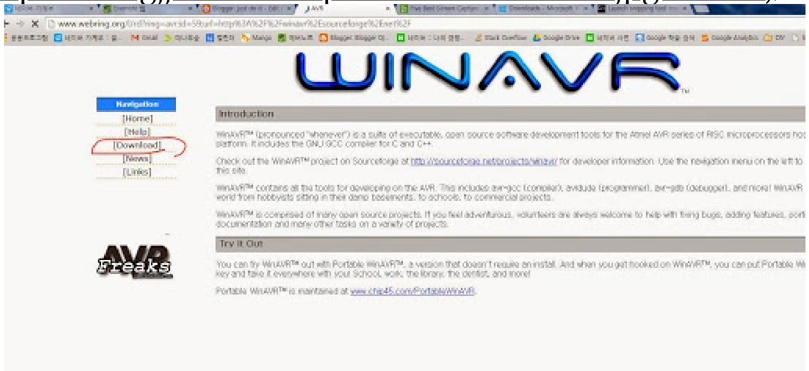
WinAVR - SourceForge
sourceforge.net › ... › Development › Build Tools ▾ 이 페이지 번역하기
2013. 4. 24. - WinAVR (tm) is a suite of executable, open source software ...

WinAVR - Browse /WinAVR/20100110 at SourceForge.net
sourceforge.net › Home › WinAVR ▾ 이 페이지 번역하기
2010. 1. 10. - WinAVR (tm) is a suite of executable, open source software ...

winavr 관련 이미지

winavr에 대한 이미지 더보기

(https://kwagjj.files.wordpress.com/2014/07/1.jpg?w=300)



Introduction

WinAVR™ (pronounced "whenever") is a suite of executable, open source software development tools for the Atmel AVR series of RISC microprocessors hos platform. It includes the GNU GCC compiler for C and C++.

Check out the WinAVR™ project on Sourceforge at http://sourceforge.net/projects/winavr/ for developer information. Use the navigation menu on the left to this site.

WinAVR™ contains all the tools for developing on the AVR. This includes avr-gcc (compiler), avrdude (programmer), avr-gdb (debugger), and more! WinAVR world from hobbyists sitting in their damp basements, to schools, to commercial projects.

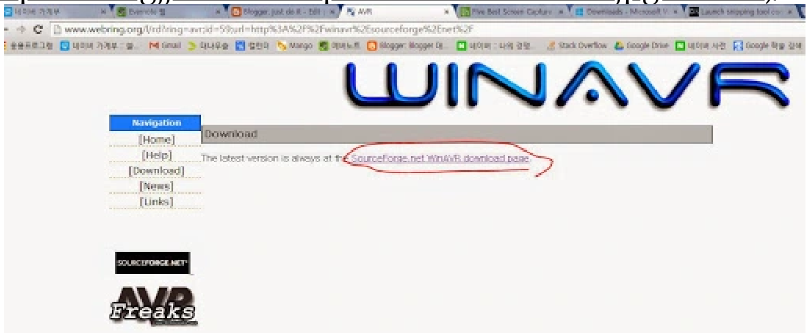
WinAVR™ is comprised of many open source projects. If you feel adventurous, volunteers are always welcome to help with fixing bugs, adding features, port documentation and many other tasks on a variety of projects.

Try It Out

You can try WinAVR™ out with Portable WinAVR™, a version that doesn't require an install. And when you get hooked on WinAVR™, you can put Portable Wi key and take it everywhere with you! School, work, the library, the dentist, and more!

Portable WinAVR™ is maintained at www.chip45.com/PortableWinAVR.

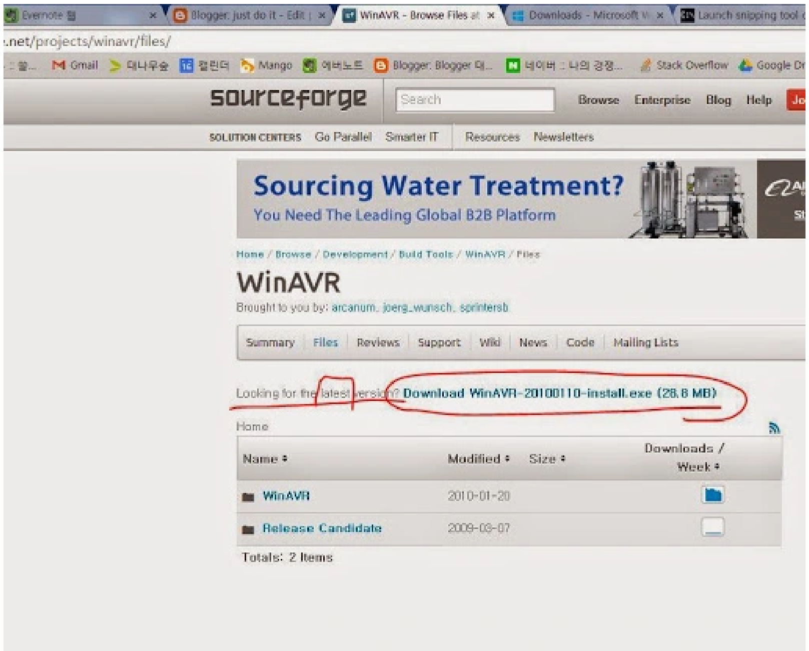
(https://kwagjj.files.wordpress.com/2014/07/2.jpg?w=300)



Download

The latest version is always at the SourceForge.net WinAVR download page.

(https://kwagjj.files.wordpress.com/2014/07/3.jpg?w=300)



WinAVR

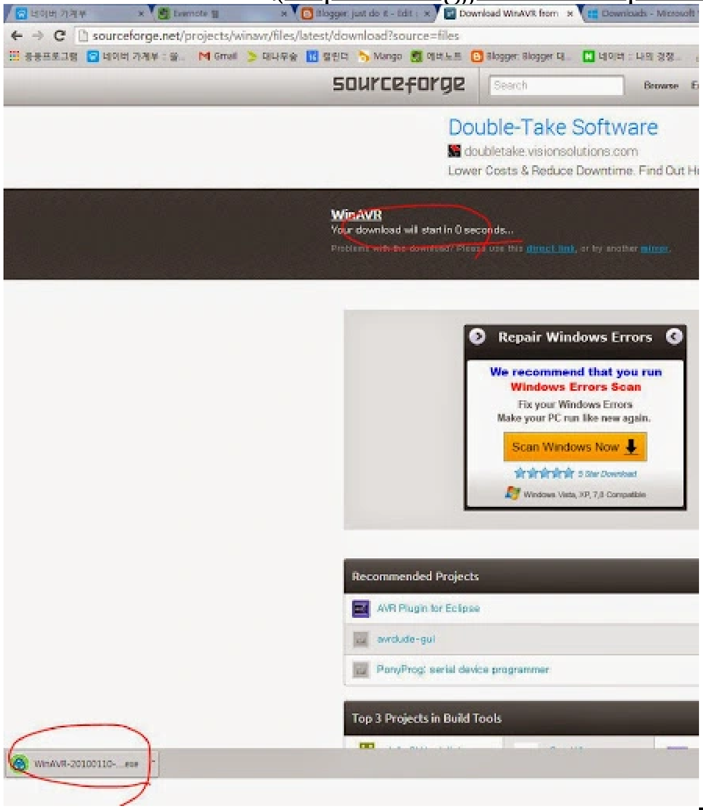
Brought to you by: arcanum, joerg_wunsch, sprintersb

Looking for the latest version? Download WinAVR-20100110-install.exe (28.8 MB)

Name	Modified	Size	Downloads / Week
WinAVR	2010-01-20		
Release Candidate	2009-03-07		

Totals: 2 Items

(https://kwagjj.files.wordpress.com/2014/07/4.jpg?w=300)

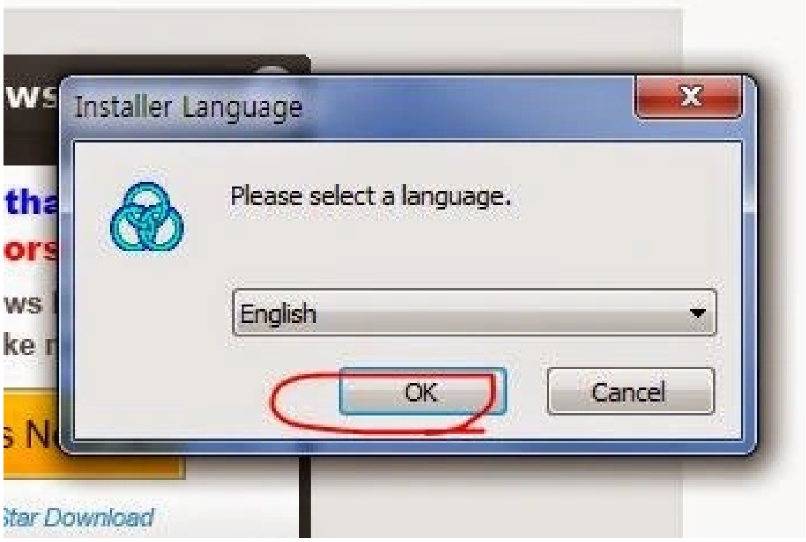

sourceforge.net/projects/winavr/files/latest/download?source=files
sourceforge
Search
Browse
Double-Take Software
doubletake.visionsolutions.com
Lower Costs & Reduce Downtime. Find Out H
Repair Windows Errors
We recommend that you run Windows Errors Scan
Fix your Windows Errors
Make your PC run like new again.
Scan Windows Now
5 Star Download
Windows Vista, XP, 7,8 Compatible
Recommended Projects
AVR Plugin for Eclipse
avrdude-gui
PonyProg: serial device programmer
Top 3 Projects in Build Tools
WinAVR-20100110-....exe

WinAVR

Your download will start in 0 seconds...

Problems with the download? Please use this direct link, or try another mirror.

(https://kwagjj.files.wordpress.com/2014/07/5.jpg?w=260)

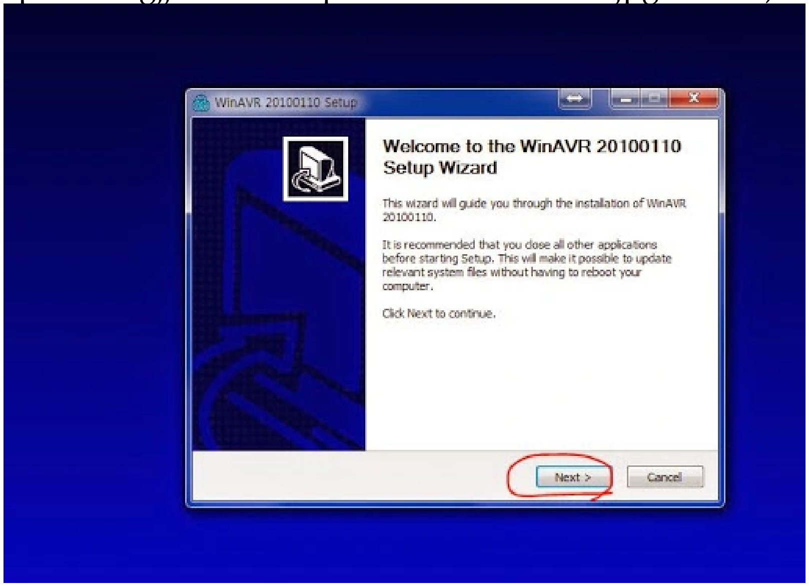


Installer Language

Please select a language.

English

(https://kwagjj.files.wordpress.com/2014/07/6.jpg?w=300)



WinAVR 20100110 Setup

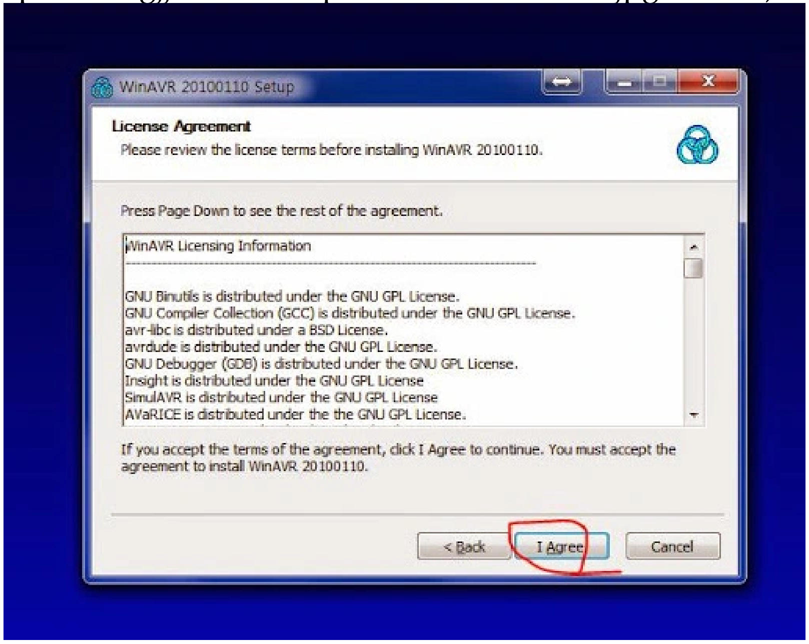
Welcome to the WinAVR 20100110 Setup Wizard

This wizard will guide you through the installation of WinAVR 20100110.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

(https://kwagjj.files.wordpress.com/2014/07/7.jpg?w=300)



WinAVR 20100110 Setup

License Agreement

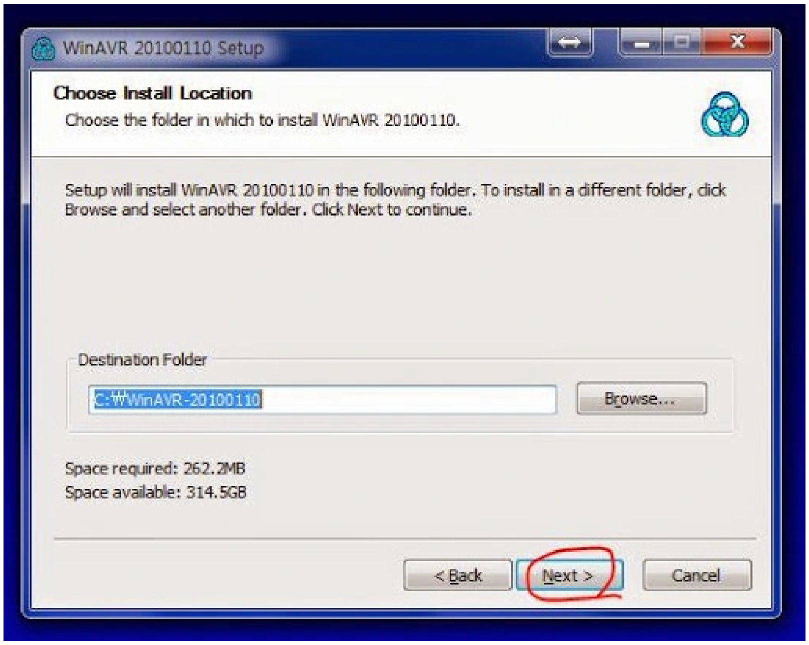
Please review the license terms before installing WinAVR 20100110.

Press Page Down to see the rest of the agreement.

```
WinAVR Licensing Information
----------------------------------------------------------------

GNU Binutils is distributed under the GNU GPL License.
GNU Compiler Collection (GCC) is distributed under the GNU GPL License.
avr-libc is distributed under a BSD License.
avrdude is distributed under the GNU GPL License.
GNU Debugger (GDB) is distributed under the GNU GPL License.
Insight is distributed under the GNU GPL License
SimulAVR is distributed under the GNU GPL License
AVaRICE is distributed under the the GNU GPL License.
```

If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install WinAVR 20100110.

(https://kwagjj.files.wordpress.com/2014/07/8.jpg?w=300)



WinAVR 20100110 Setup

Choose Install Location

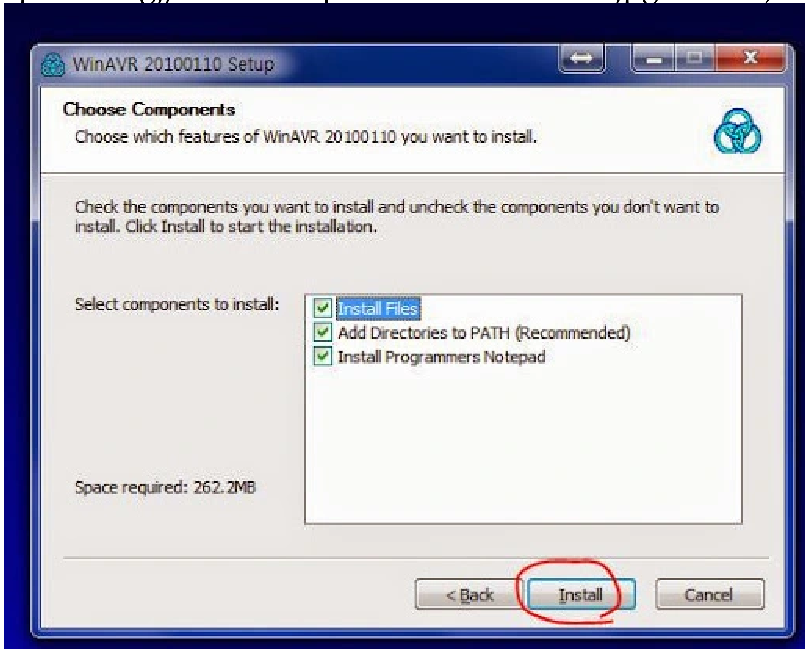
Choose the folder in which to install WinAVR 20100110.

Setup will install WinAVR 20100110 in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

Destination Folder: C:₩WinAVR-20100110

Space required: 262.2MB
Space available: 314.5GB

(https://kwagjj.files.wordpress.com/2014/07/9.jpg?w=300)



WinAVR 20100110 Setup

Choose Components

Choose which features of WinAVR 20100110 you want to install.

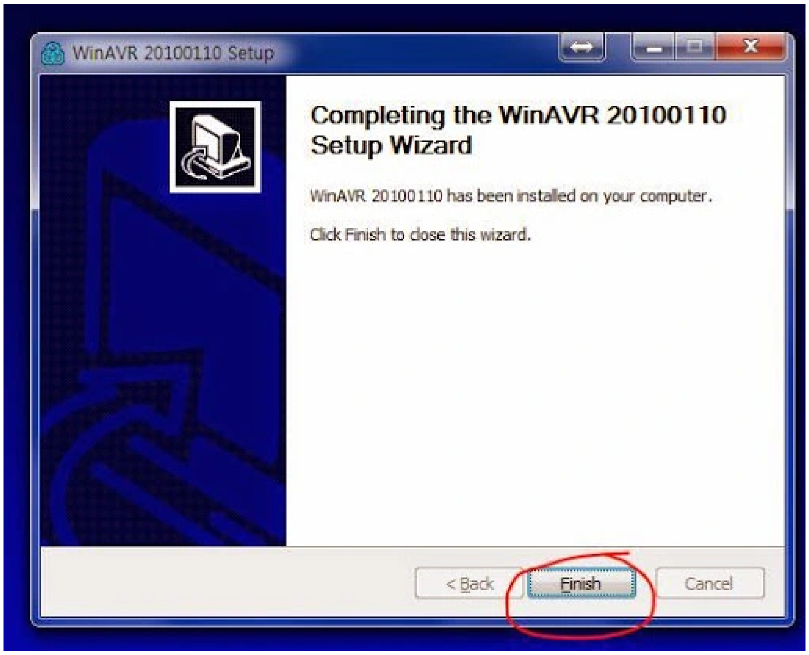
Check the components you want to install and uncheck the components you don't want to install. Click Install to start the installation.

Select components to install:

☑ Install Files
☑ Add Directories to PATH (Recommended)
☑ Install Programmers Notepad

Space required: 262.2MB

(https://kwagjj.files.wordpress.com/2014/07/10.jpg?w=300)



WinAVR 20100110 Setup

Completing the WinAVR 20100110 Setup Wizard

WinAVR 20100110 has been installed on your computer.

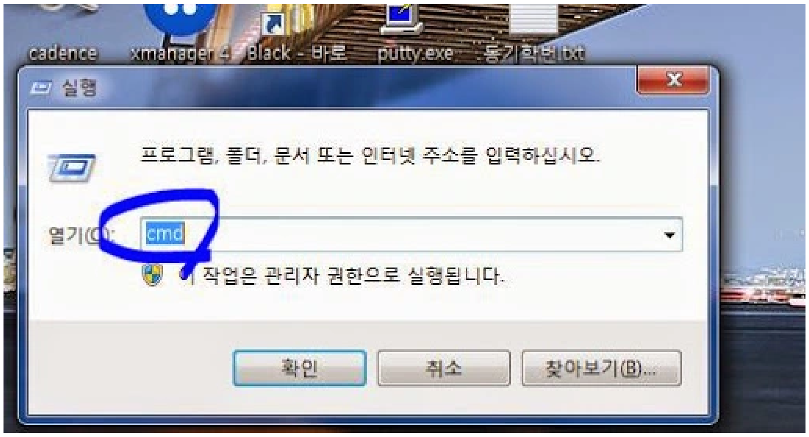
Click Finish to close this wizard.

(https://kwagjj.files.wordpress.com/2014/07/11.jpg?w=300)

after installation a webpage will be automatically opened. Its just a readme page but it's good to check out the "2.1 Manifest" part. There's a list of what kind of programs are installed. You may not know what does what, but later on when you understand how the compiling is done, you'll understand why these programs are needed and installed.

2) simple example/tutorial of compiling & uploading code to atmel chip
2-1) check if the installation works

'Start' – 'Run' and type 'cmd' to open command terminal.



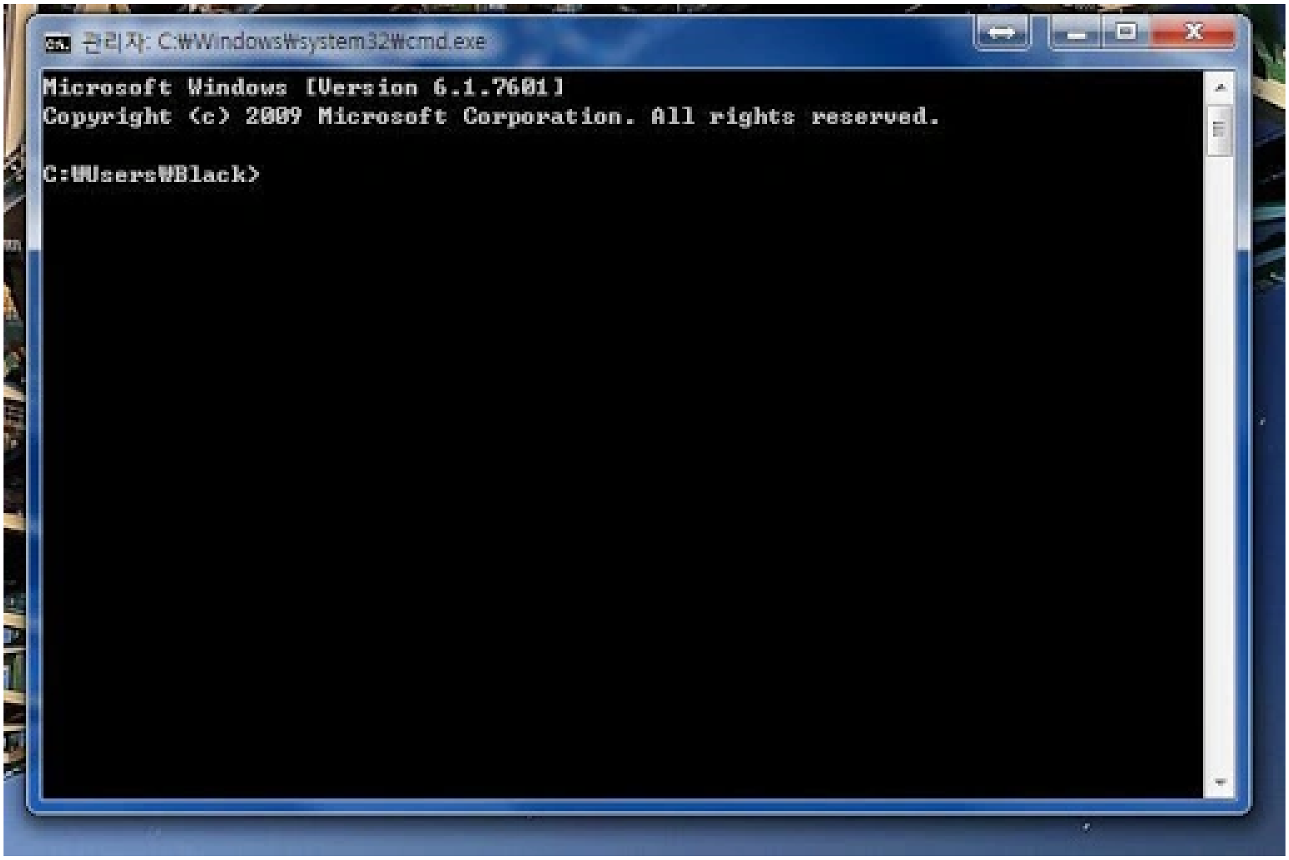
실행

프로그램, 폴더, 문서 또는 인터넷 주소를 입력하십시오.

열기(O): cmd

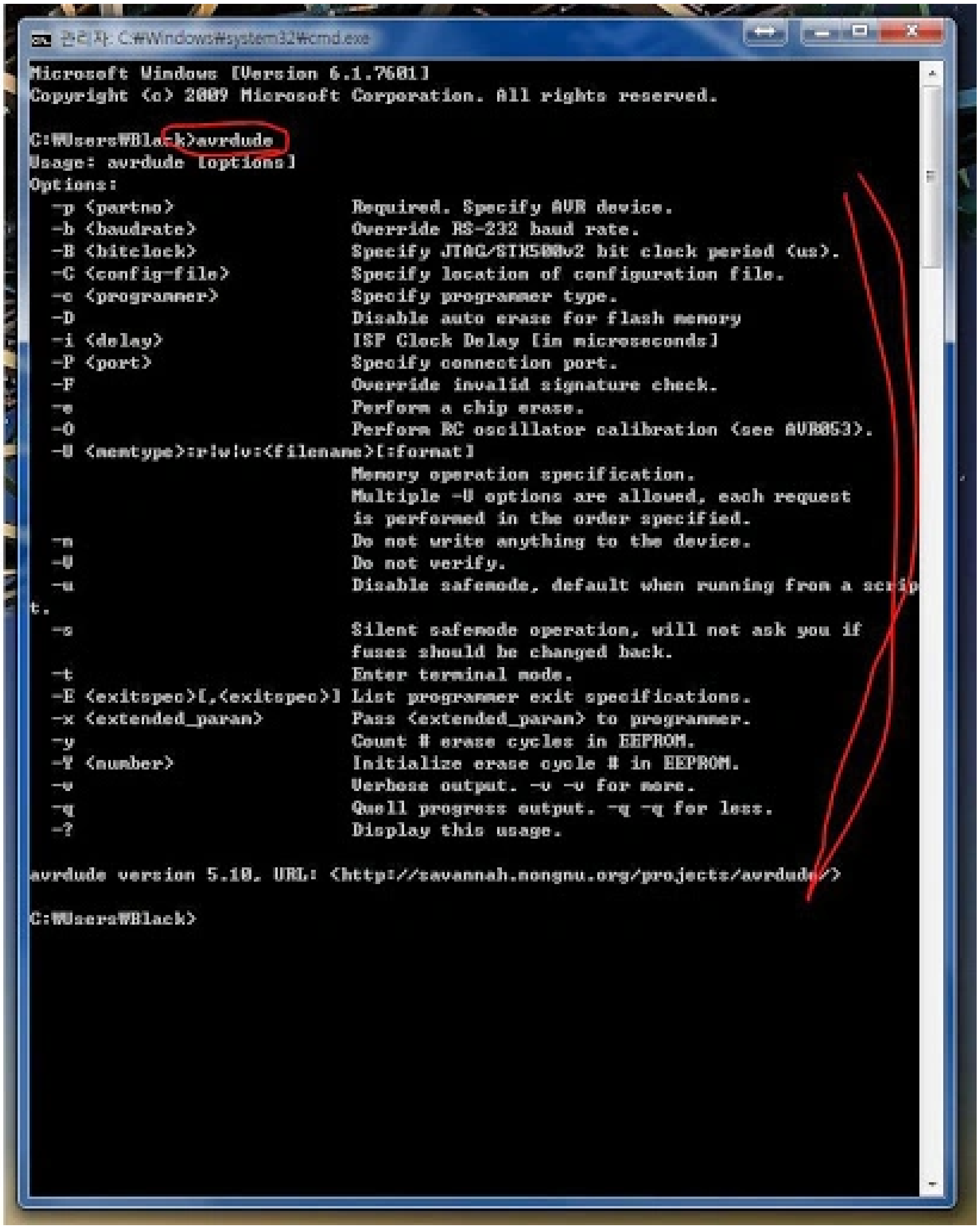
이 작업은 관리자 권한으로 실행됩니다.

(https://kwagjj.files.wordpress.com/2014/07/13.jpg?w=300)



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:₩Users₩Black>
```

(https://kwagjj.files.wordpress.com/2014/07/14.jpg?w=300)



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:₩Users₩Black>avrdude
Usage: avrdude [options]
Options:
  -p <partno>                Required. Specify AVR device.
  -b <baudrate>              Override RS-232 baud rate.
  -B <bitclock>              Specify JTAG/STK500v2 bit clock period (us).
  -C <config-file>           Specify location of configuration file.
  -c <programmer>            Specify programmer type.
  -D                         Disable auto erase for flash memory
  -i <delay>                 ISP Clock Delay [in microseconds]
  -P <port>                  Specify connection port.
  -F                         Override invalid signature check.
  -e                         Perform a chip erase.
  -O                         Perform RC oscillator calibration (see AVR053).
  -U <memtype>:r|w|v:<filename>[:format]
                             Memory operation specification.
                             Multiple -U options are allowed, each request
                             is performed in the order specified.
  -n                         Do not write anything to the device.
  -V                         Do not verify.
  -u                         Disable safemode, default when running from a scrip
t.
  -s                         Silent safemode operation, will not ask you if
                             fuses should be changed back.
  -t                         Enter terminal mode.
  -E <exitspec>[,<exitspec>] List programmer exit specifications.
  -x <extended_param>        Pass <extended_param> to programmer.
  -y                         Count # erase cycles in EEPROM.
  -Y <number>                Initialize erase cycle # in EEPROM.
  -v                         Verbose output. -v -v for more.
  -q                         Quell progress output. -q -q for less.
  -?                         Display this usage.

avrdude version 5.10, URL: <http://savannah.nongnu.org/projects/avrdude/>

C:₩Users₩Black>
```

(https://kwagjj.files.wordpress.com/2014/07/15.jpg?w=246)

type 'avrdude' and press enter. If the WinAVR is successfully installed, a bunch of introduction about 'avrdude' will appear. Of course this isn't the ultimate way of checking if the WinAVR is installed. If you have check the readme after the installation, there's a description saying that 'avrdude' is one of the programs installed during the installation of WinAVR. So, typing 'avrdude' is just a way to see if this avrdude program works or not.

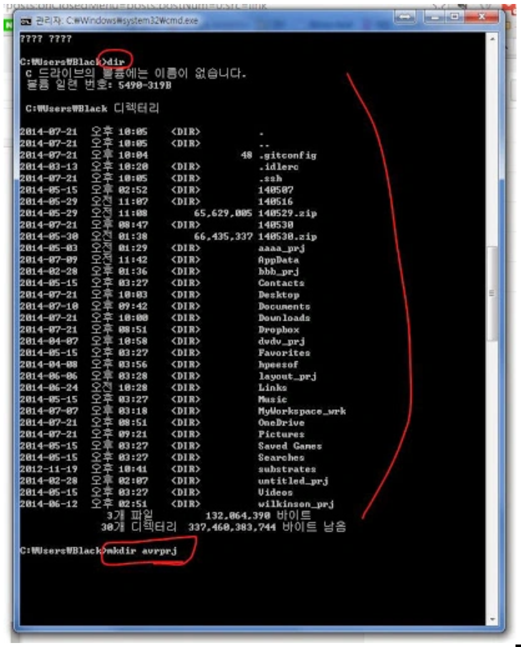
2-2) create a sample code

In my case, I am using ATmega8-16PU chip. Initially, the chip seems to be working with clock frequency of 1MHz.(This is something that I found out later. You should check the fusebit and compare it with the datasheet to check the frequency that your chip is operation with. For checking out the fusebits, here (http://kwagjj.blogspot.kr/2014/07/how-to-read-fuse-bits.html) is post about how to read/write fusebits. But try this after understanding the tutorial on this page first.)

anyhow the following is a simple code:
the code will just simply turn on and off pin PD6 every 1 second(is the program is properly set).

I'm going to save this code as 'main.c' in a directory called 'avrprj' which I made new.
I'll show you this again in steps:

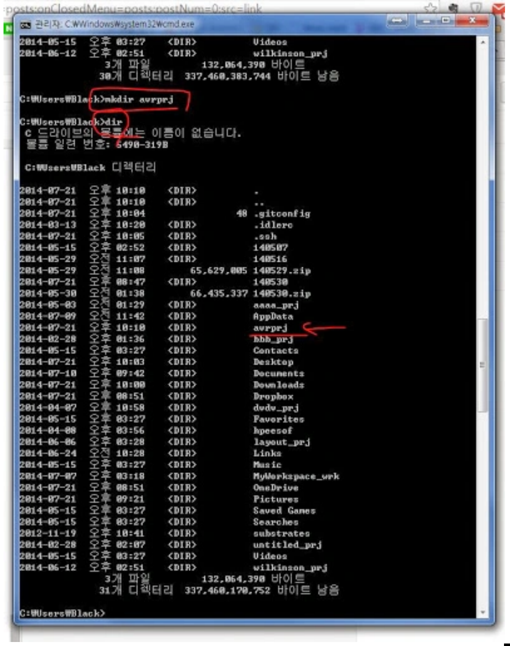
※ Again, if you have read the part I recommended to read in the readme, 'cygwin' dlls allow us to use simple unix command lines in cmdlet!!! this means you can use the well-known 'ls', 'mkdir', 'rm', 'cp' commands!! FYI, cygwin is another open-source project that allows window users to simulate a unix-like environment in Windows OS. Of course, there are limitations but its really cool and one should check this out when you have free time.



```
???? ????

C:₩Users₩Black>dir
 C 드라이브의 볼륨에는 이름이 없습니다.
 볼륨 일련 번호: 5490-319B

 C:₩Users₩Black 디렉터리

2014-07-21  오후 10:05    <DIR>          .
2014-07-21  오후 10:05    <DIR>          ..
2014-07-21  오후 10:04                48 .gitconfig
2014-03-13  오후 10:20    <DIR>          .idlerc
2014-07-21  오후 10:05    <DIR>          .ssh
2014-05-15  오후 02:52    <DIR>          140507
2014-05-29  오전 11:07    <DIR>          140516
2014-05-29  오전 11:08        65,629,005 140529.zip
2014-07-21  오후 08:47    <DIR>          140530
2014-05-30  오전 01:38        66,435,337 140530.zip
2014-05-03  오전 01:29    <DIR>          aaaa_prj
2014-07-09  오전 11:42    <DIR>          AppData
2014-02-28  오후 01:36    <DIR>          bbb_prj
2014-05-15  오후 03:27    <DIR>          Contacts
2014-07-21  오후 10:03    <DIR>          Desktop
2014-07-10  오후 09:42    <DIR>          Documents
2014-07-21  오후 10:00    <DIR>          Downloads
2014-07-21  오후 08:51    <DIR>          Dropbox
2014-04-07  오후 10:58    <DIR>          dvdv_prj
2014-05-15  오후 03:27    <DIR>          Favorites
2014-04-08  오후 03:56    <DIR>          hpeesof
2014-06-06  오후 03:28    <DIR>          layout_prj
2014-06-24  오전 10:28    <DIR>          Links
2014-05-15  오후 03:27    <DIR>          Music
2014-07-07  오후 03:18    <DIR>          MyWorkspace_wrk
2014-07-21  오후 08:51    <DIR>          OneDrive
2014-07-21  오후 09:21    <DIR>          Pictures
2014-05-15  오후 03:27    <DIR>          Saved Games
2014-05-15  오후 03:27    <DIR>          Searches
2012-11-19  오후 10:41    <DIR>          substrates
2014-02-28  오후 02:07    <DIR>          untitled_prj
2014-05-15  오후 03:27    <DIR>          Videos
2014-06-12  오후 02:51    <DIR>          wilkinson_prj
               3개 파일         132,064,390 바이트
              30개 디렉터리  337,460,383,744 바이트 남음

C:₩Users₩Black>mkdir avrprj
```

(https://kwagjj.files.wordpress.com/2014/07/a1.jpg?w=240)

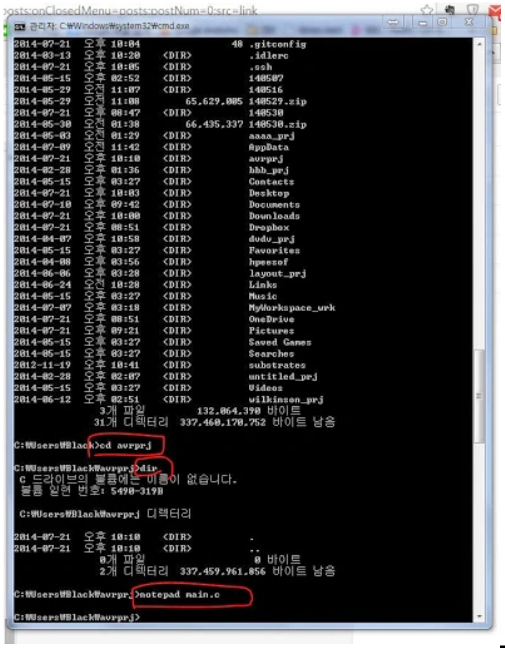
In my 'username(Black)' directory, first I'll show a list of files/dirs in this path.



```
2014-05-15  오후 03:27    <DIR>          Videos
2014-06-12  오후 02:51    <DIR>          wilkinson_prj
               3개 파일         132,064,390 바이트
              30개 디렉터리  337,460,383,744 바이트 남음

C:₩Users₩Black>mkdir avrprj

C:₩Users₩Black>dir
 C 드라이브의 볼륨에는 이름이 없습니다.
 볼륨 일련 번호: 5490-319B

 C:₩Users₩Black 디렉터리

2014-07-21  오후 10:10    <DIR>          .
2014-07-21  오후 10:10    <DIR>          ..
2014-07-21  오후 10:04                48 .gitconfig
2014-03-13  오후 10:20    <DIR>          .idlerc
2014-07-21  오후 10:05    <DIR>          .ssh
2014-05-15  오후 02:52    <DIR>          140507
2014-05-29  오전 11:07    <DIR>          140516
2014-05-29  오전 11:08        65,629,005 140529.zip
2014-07-21  오후 08:47    <DIR>          140530
2014-05-30  오전 01:38        66,435,337 140530.zip
2014-05-03  오전 01:29    <DIR>          aaaa_prj
2014-07-09  오전 11:42    <DIR>          AppData
2014-07-21  오후 10:10    <DIR>          avrprj
2014-02-28  오후 01:36    <DIR>          bbb_prj
2014-05-15  오후 03:27    <DIR>          Contacts
2014-07-21  오후 10:03    <DIR>          Desktop
2014-07-10  오후 09:42    <DIR>          Documents
2014-07-21  오후 10:00    <DIR>          Downloads
2014-07-21  오후 08:51    <DIR>          Dropbox
2014-04-07  오후 10:58    <DIR>          dvdv_prj
2014-05-15  오후 03:27    <DIR>          Favorites
2014-04-08  오후 03:56    <DIR>          hpeesof
2014-06-06  오후 03:28    <DIR>          layout_prj
2014-06-24  오전 10:28    <DIR>          Links
2014-05-15  오후 03:27    <DIR>          Music
2014-07-07  오후 03:18    <DIR>          MyWorkspace_wrk
2014-07-21  오후 08:51    <DIR>          OneDrive
2014-07-21  오후 09:21    <DIR>          Pictures
2014-05-15  오후 03:27    <DIR>          Saved Games
2014-05-15  오후 03:27    <DIR>          Searches
2012-11-19  오후 10:41    <DIR>          substrates
2014-02-28  오후 02:07    <DIR>          untitled_prj
2014-05-15  오후 03:27    <DIR>          Videos
2014-06-12  오후 02:51    <DIR>          wilkinson_prj
               3개 파일         132,064,390 바이트
              31개 디렉터리  337,460,170,752 바이트 남음

C:₩Users₩Black>
```

(https://kwagjj.files.wordpress.com/2014/07/a2.jpg?w=234)

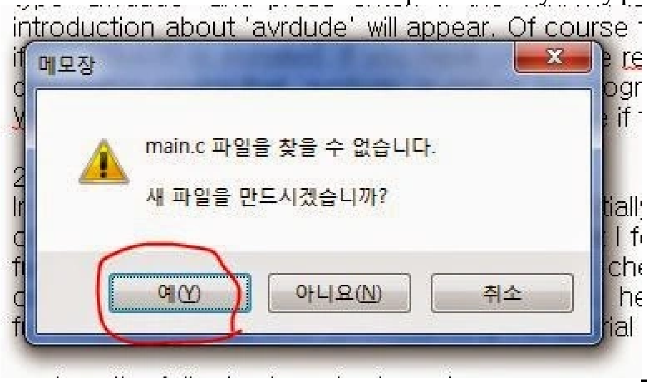
now I'll make a new directory named 'avrprj'. I typed 'mkdir avrprj'. After that I typed 'dir' again to check if the directory is created. You can see that a directory named 'avrprj' has created successfully.



```
2014-07-21  오후 10:04            48 .gitconfig
2014-03-13  오후 10:20    <DIR>          .idlerc
2014-07-21  오후 10:05    <DIR>          .ssh
2014-05-15  오후 02:52    <DIR>          140507
2014-05-29  오전 11:07    <DIR>          140516
2014-05-29  오전 11:08        65,629,005 140529.zip
2014-07-21  오후 08:47    <DIR>          140530
2014-05-30  오전 01:30        66,435,337 140530.zip
2014-05-03  오전 01:29    <DIR>          aaaa_prj
2014-07-09  오전 11:42    <DIR>          AppData
2014-07-21  오후 10:10    <DIR>          avrprj
2014-02-28  오후 01:36    <DIR>          bbb_prj
2014-05-15  오후 03:27    <DIR>          Contacts
2014-07-21  오후 10:03    <DIR>          Desktop
2014-07-10  오후 09:42    <DIR>          Documents
2014-07-21  오후 10:00    <DIR>          Downloads
2014-07-21  오후 08:51    <DIR>          Dropbox
2014-04-07  오후 10:58    <DIR>          dudu_prj
2014-05-15  오후 03:27    <DIR>          Favorites
2014-04-08  오후 03:56    <DIR>          hpeesof
2014-06-06  오후 03:28    <DIR>          layout_prj
2014-06-24  오전 10:28    <DIR>          Links
2014-05-15  오후 03:27    <DIR>          Music
2014-07-07  오후 03:18    <DIR>          MyWorkspace_wrk
2014-07-21  오후 08:51    <DIR>          OneDrive
2014-07-21  오후 09:21    <DIR>          Pictures
2014-05-15  오후 03:27    <DIR>          Saved Games
2014-05-15  오후 03:27    <DIR>          Searches
2012-11-19  오후 10:41    <DIR>          substrates
2014-02-28  오후 02:07    <DIR>          untitled_prj
2014-05-15  오후 03:27    <DIR>          Videos
2014-06-12  오후 02:51    <DIR>          wilkinson_prj
               3개 파일         132,064,390 바이트
              31개 디렉터리  337,460,170,752 바이트 남음

C:₩Users₩Black>cd avrprj

C:₩Users₩Black₩avrprj>dir
 C 드라이브의 볼륨에는 이름이 없습니다.
 볼륨 일련 번호: 5490-319B

 C:₩Users₩Black₩avrprj 디렉터리

2014-07-21  오후 10:10    <DIR>          .
2014-07-21  오후 10:10    <DIR>          ..
               0개 파일                   0 바이트
               2개 디렉터리  337,459,961,856 바이트 남음

C:₩Users₩Black₩avrprj>notepad main.c

C:₩Users₩Black₩avrprj>
```

[(https://kwagjj.files.wordpress.com/2014/07/a3.jpg?w=232)](https://kwagjj.files.wordpress.com/2014/07/a3.jpg?w=232)

move to 'avrprj' by typing 'cd avrprj'. Then I typed 'dir' to see the contents. Clearly, there are no contents in this directory. now, It's time to create a file named 'main.c' to put in the code shown previously. I type in 'notepad main.c'


introduction about 'avrdude' will appear. Of course

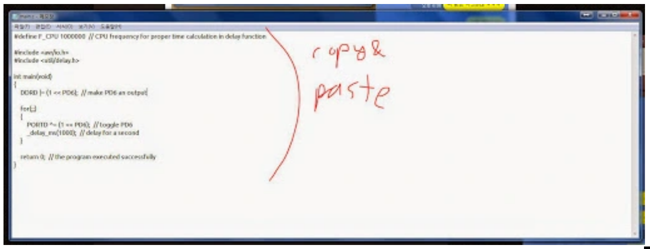
메모장

main.c 파일을 찾을 수 없습니다.

새 파일을 만드시겠습니까?

[(https://kwagjj.files.wordpress.com/2014/07/a4.jpg?w=300)](https://kwagjj.files.wordpress.com/2014/07/a4.jpg?w=300)

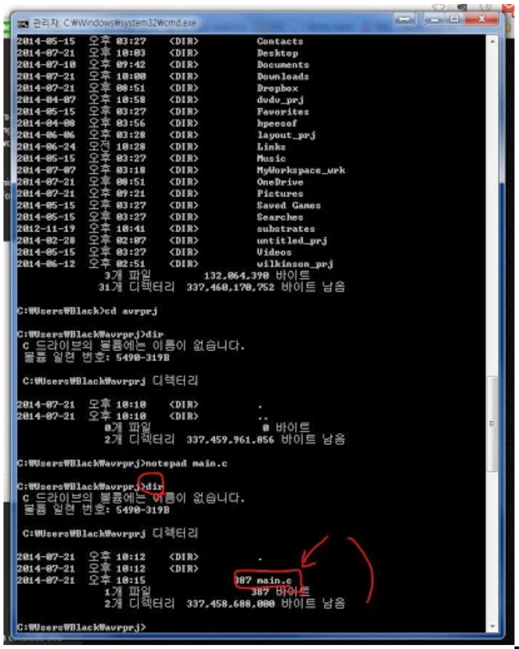
The notepad program executes but a popup alerting that there is no such file named 'main.c' exists and asks the user if he would like to create the file 'main.c'. Click 'yes' to create one.



```
#define F_CPU 1000000 // CPU frequency for proper time calculation in delay function

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

int main(void)
{
  DDRD |= (1 << PD6); // make PD6 an output

  for(;;)
  {
    PORTD ^= (1 << PD6); // toggle PD6
    _delay_ms(1000); // delay for a second
  }

  return 0; // the program executed successfully
}
```

[(https://kwagjj.files.wordpress.com/2014/07/a5.jpg?w=300)](https://kwagjj.files.wordpress.com/2014/07/a5.jpg?w=300)

copy and paste the example code shown previously. Save it and close the notepad.



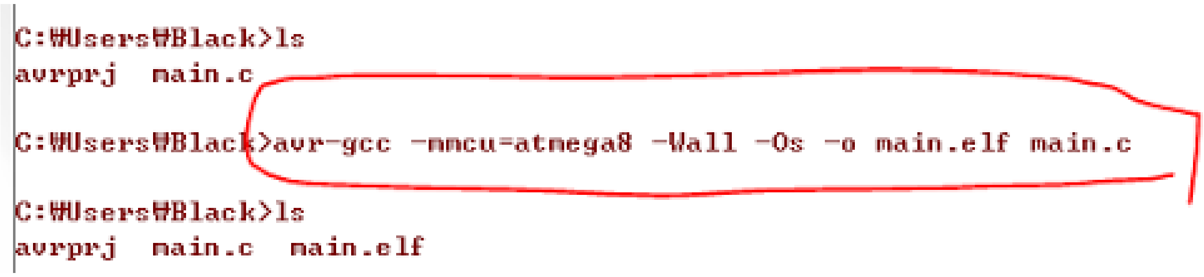
```
2014-05-15  오후 03:27    <DIR>          Contacts
2014-07-21  오후 10:03    <DIR>          Desktop
2014-07-10  오후 09:42    <DIR>          Documents
2014-07-21  오후 10:00    <DIR>          Downloads
2014-07-21  오후 08:51    <DIR>          Dropbox
2014-04-07  오후 10:58    <DIR>          dvdv_prj
2014-05-15  오후 03:27    <DIR>          Favorites
2014-04-08  오후 03:56    <DIR>          hpeesof
2014-06-06  오후 03:28    <DIR>          layout_prj
2014-06-24  오전 10:28    <DIR>          Links
2014-05-15  오후 03:27    <DIR>          Music
2014-07-07  오후 03:18    <DIR>          MyWorkspace_wrk
2014-07-21  오후 08:51    <DIR>          OneDrive
2014-07-21  오후 09:21    <DIR>          Pictures
2014-05-15  오후 03:27    <DIR>          Saved Games
2014-05-15  오후 03:27    <DIR>          Searches
2012-11-19  오후 10:41    <DIR>          substrates
2014-02-28  오후 02:07    <DIR>          untitled_prj
2014-05-15  오후 03:27    <DIR>          Videos
2014-06-12  오후 02:51    <DIR>          wilkinson_prj
               3개 파일         132,064,390 바이트
              31개 디렉터리  337,460,170,752 바이트 남음

C:₩Users₩Black>cd avrprj

C:₩Users₩Black₩avrprj>dir
 C 드라이브의 볼륨에는 이름이 없습니다.
 볼륨 일련 번호: 5490-319B

 C:₩Users₩Black₩avrprj 디렉터리

2014-07-21  오후 10:10    <DIR>          .
2014-07-21  오후 10:10    <DIR>          ..
               0개 파일                   0 바이트
               2개 디렉터리  337,459,961,856 바이트 남음

C:₩Users₩Black₩avrprj>notepad main.c

C:₩Users₩Black₩avrprj>dir
 C 드라이브의 볼륨에는 이름이 없습니다.
 볼륨 일련 번호: 5490-319B

 C:₩Users₩Black₩avrprj 디렉터리

2014-07-21  오후 10:12    <DIR>          .
2014-07-21  오후 10:12    <DIR>          ..
2014-07-21  오후 10:15               387 main.c
               1개 파일                 387 바이트
               2개 디렉터리  337,458,688,000 바이트 남음

C:₩Users₩Black₩avrprj>
```

(https://kwagjj.files.wordpress.com/2014/07/a6.jpg?w=239)

now lets check if the 'main.c' has been created. type 'dir' again and check that 'main.c' has been created successfully.

2-3) compile and upload 'main.c'

here I present 'three' command lines that will compile and upload the code to the atmel chip. Here I am using arduino uno as the avr programmer.

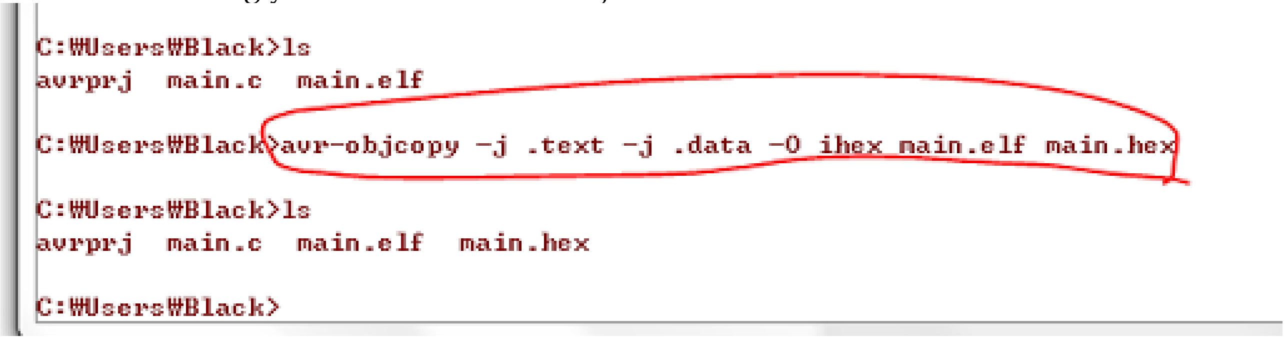


```
C:₩Users₩Black>ls
avrprj  main.c

C:₩Users₩Black>avr-gcc -mmcu=atmega8 -Wall -Os -o main.elf main.c

C:₩Users₩Black>ls
avrprj  main.c  main.elf
```

(https://kwagjj.files.wordpress.com/2014/07/1.png?w=300)

the first command is: "avr-gcc -mmcu=atmega8 -Wall -Os -o main.elf main.c"

after executing you will find that an object file named 'main.elf' has been created.

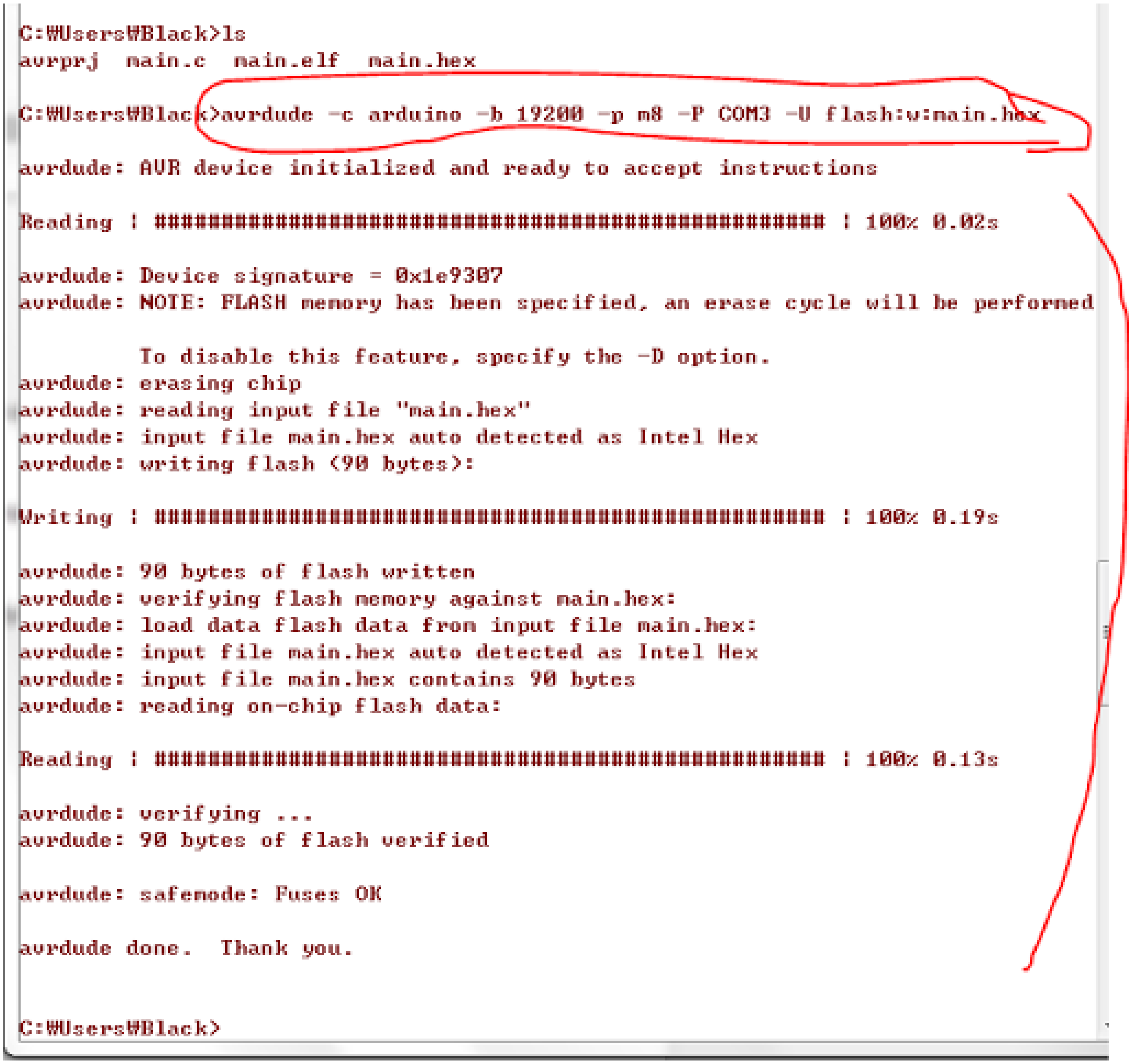


```
C:₩Users₩Black>ls
avrprj  main.c  main.elf

C:₩Users₩Black>avr-objcopy -j .text -j .data -O ihex main.elf main.hex

C:₩Users₩Black>ls
avrprj  main.c  main.elf  main.hex

C:₩Users₩Black>
```

(https://kwagjj.files.wordpress.com/2014/07/2.png?w=300)

the second command: "avr-objcopy -j .text -j .data -O ihex main.elf main.hex"

this command picks up the .text and .data parts of main.elf and converts them into ihex format file named main.hex. After execution, you'll notice "main.hex" has been newly created.



```
C:₩Users₩Black>ls
avrprj  main.c  main.elf  main.hex

C:₩Users₩Black>avrdude -c arduino -b 19200 -p m8 -P COM3 -U flash:w:main.hex

avrdude: AVR device initialized and ready to accept instructions

Reading | ################################################## | 100% 0.02s

avrdude: Device signature = 0x1e9307
avrdude: NOTE: FLASH memory has been specified, an erase cycle will be performed

         To disable this feature, specify the -D option.
avrdude: erasing chip
avrdude: reading input file "main.hex"
avrdude: input file main.hex auto detected as Intel Hex
avrdude: writing flash (90 bytes):

Writing | ################################################## | 100% 0.19s

avrdude: 90 bytes of flash written
avrdude: verifying flash memory against main.hex:
avrdude: load data flash data from input file main.hex:
avrdude: input file main.hex auto detected as Intel Hex
avrdude: input file main.hex contains 90 bytes
avrdude: reading on-chip flash data:

Reading | ################################################## | 100% 0.13s

avrdude: verifying ...
avrdude: 90 bytes of flash verified

avrdude: safemode: Fuses OK

avrdude done.  Thank you.


C:₩Users₩Black>
```

(https://kwagjj.files.wordpress.com/2014/07/3.png?w=300)

the third command is : "avrdude -c arduino -b 19200 -p m8 -P COM3 -U flash:w:main.hex"

this ones got a lot of options.

first, the '-c' option declares the type of avr programmer you are using. Since I'm using the arduino-transformed avr programmer I wrote 'arduino'. If you're using a different avr programmer, you need to write the correct option.

'-b' switch declares the baud rate I'm going to communicate with. In my case, I'm guessing because I'm currently communicating with the arduino with a baud rate of 19200, I have to write down '-b 19200' here. In other cases which I saw from googling, some don't write '-b' switch at all. I guess this depends on other external factors.

'-p' switch declares what kind of chip I'm using. Since I'm using atmega8-16pu, this model is included in the category of 'm8'. If you have a different chip, you probably should type in a different category name for this switch. The list of compatible chip categories are written in this webpage (http://www.nongnu.org/avrdude/user-manual/avrdude_4.html).

'-P' switch declares the serial port which you will be sending the hex file to. In my case, when I opened the sketch program(for arduino programming) I noticed that the arduino is connected to COM3 port. So, I just wrote down 'COM3' for this switch. Please check which COM port the avr programmer is connected to.

'-U' declares what kind of action you will do after doing all the setting to communicate with the chip. In this case, we are trying to shove the hex file into the chip. This is what the 'flash:w:main.hex' means. 'flash' means you're 'flashing' the code in to the chip. ":w" means 'with' literally. ":main.hex" means that the 'main.hex' file is what you wish to flash with.
After pressing enter, you'll see a bunch of lines that show the progress of flashing. In the image above, the flash process has been successful. If not, you might get some error messages. Here's a tip: even though an error occurs, that "avrdude done. Thank you" message always come up at the end. So don't be fooled that you've succeeded in uploading the code just by this message.
If the uploading is done successfully, the chip will immediately work as the code says. Here's a video of my atmega8 chip blinking the led on PD6 pin. You may notice that it blinks much faster than 1 second. This is because our sample code was written under the assumption that the operation clock is 1MHz. But recently I've changed the chip operation frequency to 8MHz by changing the fuse bits. This is why the led is blinking 8 times faster than we intended.

//www.youtube.com/get_player (//www.youtube.com/get_player)

congratulations! now you know the basic steps to program an atmel chip! The procedures I wrote here are not the only way to program the chip. You might feel a bit uncomfortable using a command line directly. If so, you could just use the 'programmer's notepad' which is installed as a part of WinAVR. You can lookup at other WinAVR tutorials using such programs. However, I found directly using the command lines are much useful and helpful(+and more awesome) for understanding how avr programming works.

By the way, about the three command lines that I showed you, aren't they kind of irritating to write down everytime you want to compile and upload?? Here's a really good tip: the command lines can be stored in a script called 'Makefile' and you can use 'make' program(which is installed as a part of WinAVR) to make this procedure much simpler!
Check out this post (http://kwagjj.blogspot.com/2014/07/what-and-how-to-usemake-your-own.html) on how to use Makefiles. Understanding this is directly related to you're understanding of using Mfile program later on.

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